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**Department of Defense
Fiscal Year (FY) 2024 Budget Estimates**

March 2023



Navy

Justification Book Volume 2 of 5

Research, Development, Test & Evaluation, Navy

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Navy • Budget Estimates FY 2024 • RDT&E Program

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Department of Defense Appropriations Act, 2024

Research, Development, Test and Evaluation, Navy

For expenses necessary for basic and applied scientific research, development, test and evaluation, including maintenance, rehabilitation, lease, and operation of facilities and equipment, \$26,922,225 to remain available for obligation until September 30, 2025.

Fiscal Year (FY) 2024 Overseas Operations Costs funding accounted for in the Base budget total \$15.

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Department of the Navy
FY 2024 President's Budget
Exhibit R-1 FY 2024 President's Budget
Total Obligational Authority
(Dollars in Thousands)

	FY 2022 Actuals	FY 2023 Less Supplementals Enacted	FY 2023 Supplementals Enacted*	FY 2023 Total Enacted	FY 2024 Request
<u>Summary Recap of Budget Activities</u>					
Basic Research	681,475	688,889		688,889	637,263
Applied Research	1,243,015	1,487,017		1,487,017	1,026,339
Advanced Technology Development	960,390	1,309,342		1,309,342	1,016,552
Advanced Component Development & Prototypes	6,663,911	8,548,769		8,548,769	9,734,483
System Development & Demonstration	5,308,050	6,472,604		6,472,604	6,962,234
Management Support	1,602,667	1,251,196		1,251,196	1,163,613
Operational Systems Development	5,544,231	6,221,872	40,577	6,262,449	6,359,438
Software And Digital Technology Pilot Programs	29,128	24,008		24,008	22,303
Total Research, Development, Test, & Evaluation	22,032,867	26,003,697	40,577	26,044,274	26,922,225
<u>Summary Recap of FYDP Programs</u>					
Strategic Forces	328,259	493,924		493,924	529,130
General Purpose Forces	1,548,495	1,790,107		1,790,107	2,079,369
Intelligence and Communications	619,446	677,588		677,588	801,122
Research and Development	17,356,083	20,650,575		20,650,575	21,462,528
Central Supply and Maintenance	39,965	28,381		28,381	26,532
Administration and Associated Activities	3,203	1,811		1,811	2,168
Space	596				
Classified Programs	2,136,820	2,361,311	40,577	2,401,888	2,021,376
Total Research, Development, Test, & Evaluation	22,032,867	26,003,697	40,577	26,044,274	26,922,225

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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Department of the Navy
FY 2024 President's Budget
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Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test and Evaluation, Navy

Line No	Program Element Number	Item	Act	Se c	FY 2022 Actuals	FY 2023 Less Supplementals Enacted	FY 2023 Supplementals Enacted*	FY 2023 Total Enacted	FY 2024 Request
1	0601103N	University Research Initiatives	01	U	169,965	147,376		147,376	96,355
2	0601153N	Defense Research Sciences	01	U	511,510	541,513		541,513	540,908
	Basic Research				681,475	688,889		688,889	637,263
3	0602114N	Power Projection Applied Research	02	U	41,760	27,953		27,953	23,982
4	0602123N	Force Protection Applied Research	02	U	215,913	345,576		345,576	142,148
5	0602131M	Marine Corps Landing Force Technology	02	U	62,130	79,467		79,467	59,208
6	0602235N	Common Picture Applied Research	02	U	50,371	51,911		51,911	52,090
7	0602236N	Warfighter Sustainment Applied Research	02	U	114,681	121,707		121,707	74,722
8	0602271N	Electromagnetic Systems Applied Research	02	U	89,120	131,288		131,288	92,473
9	0602435N	Ocean Warfighting Environment Applied Research	02	U	100,774	165,622		165,622	80,806
10	0602651M	Joint Non-Lethal Weapons Applied Research	02	U	6,213	6,659		6,659	7,419
11	0602747N	Undersea Warfare Applied Research	02	U	104,687	104,111		104,111	61,503
12	0602750N	Future Naval Capabilities Applied Research	02	U	193,392	177,141		177,141	182,662
13	0602782N	Mine and Expeditionary Warfare Applied Research	02	U	40,983	48,649		48,649	30,435
14	0602792N	Innovative Naval Prototypes (INP) Applied Research	02	U	143,842	145,637		145,637	133,828
15	0602861N	Science and Technology Management - ONR Field Acitivities	02	U	79,149	81,296		81,296	85,063
	Applied Research				1,243,015	1,487,017		1,487,017	1,026,339
16	0603123N	Force Protection Advanced Technology	03	U	35,010	59,933		59,933	29,512

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17	0603271N	Electromagnetic Systems Advanced Technology	03	U	11,762	16,253		16,253	8,418
18	0603273N	Science & Technology for Nuclear Re-entry Systems	03	U		65,735		65,735	112,329
19	0603640M	USMC Advanced Technology Demonstration (ATD)	03	U	283,332	412,747		412,747	308,217
20	0603651M	Joint Non-Lethal Weapons Technology Development	03	U	13,026	14,048		14,048	15,556
21	0603673N	Future Naval Capabilities Advanced Technology Development	03	U	275,441	268,993		268,993	264,700
22	0603680N	Manufacturing Technology Program	03	U	74,826	61,704		61,704	61,843
23	0603729N	Warfighter Protection Advanced Technology	03	U	39,057	46,999		46,999	5,100
24	0603758N	Navy Warfighting Experiments and Demonstrations	03	U	60,878	99,020		99,020	75,898
25	0603782N	Mine and Expeditionary Warfare Advanced Technology	03	U	1,922	2,007		2,007	2,048
26	0603801N	Innovative Naval Prototypes (INP) Advanced Technology Development	03	U	165,136	261,903		261,903	132,931
		Advanced Technology Development			960,390	1,309,342		1,309,342	1,016,552
27	0603128N	Unmanned Aerial System	04	U	15,545	98,883		98,883	108,225
28	0603178N	Large Unmanned Surface Vehicles (LUSV)	04	U	98,871	136,580		136,580	117,400
29	0603207N	Air/Ocean Tactical Applications	04	U	26,972	60,737		60,737	40,653
30	0603216N	Aviation Survivability	04	U	24,286	17,387		17,387	20,874
31	0603239N	Naval Construction Forces	04	U	5,271	1,706		1,706	7,821
32	0603254N	ASW Systems Development	04	U	20,079	15,977		15,977	17,090
33	0603261N	Tactical Airborne Reconnaissance	04	U	3,111	3,562		3,562	3,721

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Department of the Navy
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Appropriation: 1319N Research, Development, Test and Evaluation, Navy

Line No	Program Element Number	Item	Act	Se c	FY 2022 Actuals	FY 2023 Less Supplementals Enacted	FY 2023 Supplementals Enacted*	FY 2023 Total Enacted	FY 2024 Request
34	0603382N	Advanced Combat Systems Technology	04	U	40,937	73,128		73,128	6,216
35	0603502N	Surface and Shallow Water Mine Countermeasures	04	U	51,637	87,746		87,746	34,690
36	0603506N	Surface Ship Torpedo Defense	04	U	8,573	473		473	730
37	0603512N	Carrier Systems Development	04	U	7,109	11,567		11,567	6,095
38	0603525N	PILOT FISH	04	U	391,704	671,000		671,000	916,208
39	0603527N	RETRACT LARCH	04	U	60,941	7,483		7,483	7,545
40	0603536N	RETRACT JUNIPER	04	U	140,080	239,088		239,088	271,109
41	0603542N	Radiological Control	04	U	758	772		772	811
42	0603553N	Surface ASW	04	U	1,099	1,180		1,180	1,189
43	0603561N	Advanced Submarine System Development	04	U	96,405	110,146		110,146	88,415
44	0603562N	Submarine Tactical Warfare Systems	04	U	13,832	10,808		10,808	15,119
45	0603563N	Ship Concept Advanced Design	04	U	132,244	130,405		130,405	89,939
46	0603564N	Ship Preliminary Design & Feasibility Studies	04	U	39,472	75,305		75,305	121,402
47	0603570N	Advanced Nuclear Power Systems	04	U	203,572	227,400		227,400	319,656
48	0603573N	Advanced Surface Machinery Systems	04	U	74,439	207,000		207,000	133,911
49	0603576N	CHALK EAGLE	04	U	76,723	91,280		91,280	116,078
50	0603581N	Littoral Combat Ship (LCS)	04	U	80,254	76,364		76,364	32,615
51	0603582N	Combat System Integration	04	U	16,884	18,236		18,236	18,610
52	0603595N	Ohio Replacement	04	U	302,004	344,981		344,981	257,076
53	0603596N	LCS Mission Modules	04	U	75,189	31,707		31,707	31,464

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54	0603597N	Automated Test and Re-Test (ATRT)	04	U	36,461	60,073		60,073	10,809
55	0603599N	Frigate Development	04	U	98,022	108,626		108,626	112,972
56	0603609N	Conventional Munitions	04	U	7,245	9,286		9,286	9,030
57	0603635M	Marine Corps Ground Combat/Support System	04	U	69,451	111,431		111,431	128,782
58	0603654N	Joint Service Explosive Ordnance Development	04	U	33,974	36,304		36,304	44,766
59	0603713N	Ocean Engineering Technology Development	04	U	8,547	6,193		6,193	10,751
60	0603721N	Environmental Protection	04	U	28,150	21,647		21,647	24,457
61	0603724N	Navy Energy Program	04	U	64,991	75,320		75,320	72,214
62	0603725N	Facilities Improvement	04	U	6,306	5,664		5,664	10,149
63	0603734N	CHALK CORAL	04	U	558,549	753,303		753,303	687,841
64	0603739N	Navy Logistic Productivity	04	U	643	899		899	4,712
65	0603746N	RETRACT MAPLE	04	U	275,379	363,874		363,874	420,455
66	0603748N	LINK PLUMERIA	04	U	643,600	1,038,239		1,038,239	2,100,474
67	0603751N	RETRACT ELM	04	U	79,593	82,684		82,684	88,036
68	0603764M	LINK EVERGREEN	04	U	254,492	313,409		313,409	547,005
69	0603790N	NATO Research and Development	04	U	5,805	8,041		8,041	6,265
70	0603795N	Land Attack Technology	04	U	3,922	358		358	1,624
71	0603851M	Joint Non-Lethal Weapons Testing	04	U	27,556	30,533		30,533	31,058
72	0603860N	Joint Precision Approach and Landing Systems - Dem/Val	04	U	20,223	18,628		18,628	22,590
73	0603925N	Directed Energy and Electric Weapon Systems	04	U	80,055	65,080		65,080	52,129

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74	0604014N	F/A -18 Infrared Search and Track (IRST)	04	U	47,637	55,069		55,069	32,127
75	0604027N	Digital Warfare Office	04	U	44,969	165,753		165,753	181,001
76	0604028N	Small and Medium Unmanned Undersea Vehicles	04	U	77,806	88,839		88,839	110,506
77	0604029N	Unmanned Undersea Vehicle Core Technologies	04	U	63,262	59,652		59,652	71,156
78	0604030N	Rapid Prototyping, Experimentation and Demonstration.	04	U		50,580		50,580	214,100
79	0604031N	Large Unmanned Undersea Vehicles	04	U	27,510				6,900
80	0604112N	Gerald R. Ford Class Nuclear Aircraft Carrier (CVN 78 - 80)	04	U	117,878	116,498		116,498	118,182
81	0604126N	Littoral Airborne MCM	04	U	18,067	30,240		30,240	
82	0604127N	Surface Mine Countermeasures	04	U	11,924	12,959		12,959	16,127
83	0604272N	Tactical Air Directional Infrared Countermeasures (TADIRCM)	04	U	32,530	39,028		39,028	34,684
84	0604289M	Next Generation Logistics	04	U	7,796	7,342		7,342	5,991
85	0604292N	Future Vertical Lift (Maritime Strike)	04	U	8,269	5,103		5,103	2,100
86	0604320M	Rapid Technology Capability Prototype	04	U	11,199	67,927		67,927	131,763
87	0604454N	LX (R)	04	U	3,332	18,830		18,830	21,319
88	0604536N	Advanced Undersea Prototyping	04	U	30,597	94,515		94,515	104,328
89	0604636N	Counter Unmanned Aircraft Systems (C-UAS)	04	U	5,462	7,438		7,438	11,567
90	0604659N	Precision Strike Weapons Development Program	04	U	80,661	34,824		34,824	5,976
91	0604707N	Space and Electronic Warfare (SEW) Architecture/Engineering Support	04	U	8,980	10,229		10,229	9,993

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Line No	Program Element Number	Item	Act	Se c	FY 2022 Actuals	FY 2023 Less Supplementals Enacted	FY 2023 Supplementals Enacted*	FY 2023 Total Enacted	FY 2024 Request
92	0604786N	Offensive Anti-Surface Warfare Weapon Development	04	U	75,093	223,826		223,826	237,655
93	0605512N	MEDIUM UNMANNED SURFACE VEHICLES (MUSVs))	04	U	57,872	85,966		85,966	85,800
94	0605513N	Unmanned Surface Vehicle Enabling Capabilities	04	U	115,436	181,534		181,534	176,261
95	0605514M	GROUND BASED ANTI-SHIP MISSILE	04	U	98,762	43,090		43,090	36,383
96	0605516M	LONG RANGE FIRES	04	U	85,073	36,693		36,693	36,763
97	0605518N	CONVENTIONAL PROMPT STRIKE (CPS)	04	U	1,282,595	1,230,041		1,230,041	901,064
98	0303354N	ASW Systems Development - MIP	04	U	8,536	9,769		9,769	10,167
99	0304240M	Advanced Tactical Unmanned Aircraft System	04	U	31,204	11,735		11,735	539
100	0304270N	Electronic Warfare Development - MIP	04	U	506	796		796	1,250
	Advanced Component Development & Prototypes				6,663,911	8,548,769		8,548,769	9,734,483
101	0603208N	Training System Aircraft	05	U	5,758	15,128		15,128	44,120
102	0604038N	Maritime Targeting Cell	05	U		69,600		69,600	30,922
103	0604212M	Other Helo Development	05	U					101,209
104	0604212N	Other Helo Development	05	U	47,802	66,010		66,010	2,604
105	0604214M	AV-8B Aircraft - Eng Dev	05	U	10,037	9,205		9,205	8,263
106	0604215N	Standards Development	05	U	4,066	3,766		3,766	4,039
107	0604216N	Multi-Mission Helicopter Upgrade Development	05	U	52,962	54,684		54,684	62,350
108	0604221N	P-3 Modernization Program	05	U	564	343		343	771
109	0604230N	Warfare Support System	05	U	14,945	16,337		16,337	109,485
110	0604231N	Command and Control Systems	05	U	118,895	143,573		143,573	87,457

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Department of the Navy
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111	0604234N	Advanced Hawkeye	05	U	339,032	487,281		487,281	399,919
112	0604245M	H-1 Upgrades	05	U	49,316	43,759		43,759	29,766
113	0604261N	Acoustic Search Sensors	05	U	47,534	50,231		50,231	51,531
114	0604262N	V-22A	05	U	89,448	125,233		125,233	137,597
115	0604264N	Air Crew Systems Development	05	U	20,271	50,282		50,282	42,155
116	0604269N	EA-18	05	U	58,692	116,589		116,589	172,507
117	0604270N	Electronic Warfare Development	05	U	126,373	144,471		144,471	171,384
118	0604273M	Executive Helo Development	05	U	40,496	45,645		45,645	35,376
119	0604274N	Next Generation Jammer (NGJ)	05	U	230,396	54,679		54,679	40,477
120	0604280N	Joint Tactical Radio System - Navy (JTRS-Navy)	05	U	225,867	334,787		334,787	451,397
121	0604282N	Next Generation Jammer (NGJ) Increment II	05	U	72,937	135,467		135,467	250,577
122	0604307N	Surface Combatant Combat System Engineering	05	U	321,118	345,489		345,489	453,311
123	0604311N	LPD-17 Class Systems Integration	05	U	869				
124	0604329N	Small Diameter Bomb (SDB)	05	U	39,366	42,881		42,881	52,211
125	0604366N	Standard Missile Improvements	05	U	341,355	309,943		309,943	418,187
126	0604373N	Airborne MCM	05	U	10,838	10,882		10,882	11,368
127	0604378N	Naval Integrated Fire Control - Counter Air Systems Engineering	05	U	49,110	45,892		45,892	66,445
128	0604419N	Advanced Sensors Application Program (ASAP)	05	U	10,000	13,000		13,000	
129	0604501N	Advanced Above Water Sensors	05	U	60,394	72,772		72,772	115,396
130	0604503N	SSN-688 and Trident Modernization	05	U	92,168	93,501		93,501	93,435

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131	0604504N	Air Control	05	U	32,614	39,138		39,138	42,656
132	0604512N	Shipboard Aviation Systems	05	U	8,889	11,759		11,759	10,442
133	0604518N	Combat Information Center Conversion	05	U	11,389	16,160		16,160	11,359
134	0604522N	Air and Missile Defense Radar (AMDR) System	05	U	84,526	87,341		87,341	90,307
135	0604530N	Advanced Arresting Gear (AAG)	05	U	146	151		151	10,658
136	0604558N	New Design SSN	05	U	468,358	316,085		316,085	234,356
137	0604562N	Submarine Tactical Warfare System	05	U	60,806	58,741		58,741	71,516
138	0604567N	Ship Contract Design/ Live Fire T&E	05	U	52,878	60,791		60,791	22,462
139	0604574N	Navy Tactical Computer Resources	05	U	4,267	4,177		4,177	4,279
140	0604601N	Mine Development	05	U	37,054	60,793		60,793	104,731
141	0604610N	Lightweight Torpedo Development	05	U	92,274	135,500		135,500	229,668
142	0604654N	Joint Service Explosive Ordnance Development	05	U	8,315	8,618		8,618	9,064
143	0604657M	USMC Ground Combat/Supporting Arms Systems - Eng Dev	05	U	40,885	45,025		45,025	62,329
144	0604703N	Personnel, Training, Simulation, and Human Factors	05	U	7,128	7,454		7,454	9,319
145	0604727N	Joint Standoff Weapon Systems	05	U		758		758	1,964
146	0604755N	Ship Self Defense (Detect & Control)	05	U	139,580	156,426		156,426	158,426
147	0604756N	Ship Self Defense (Engage: Hard Kill)	05	U	105,984	84,518		84,518	47,492
148	0604757N	Ship Self Defense (Engage: Soft Kill/EW)	05	U	64,200	97,537		97,537	125,206
149	0604761N	Intelligence Engineering	05	U	20,684	23,742		23,742	19,969
150	0604771N	Medical Development	05	U	30,429	16,178		16,178	6,061

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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Appropriation: 1319N Research, Development, Test and Evaluation, Navy

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151	0604777N	Navigation/ID System	05	U	48,510	60,209		60,209	45,262
152	0604800M	Joint Strike Fighter (JSF) - EMD	05	U	555	611		611	
153	0604800N	Joint Strike Fighter (JSF) - EMD	05	U	252	234		234	
154	0604850N	SSN(X)	05	U	29,174	133,772		133,772	361,582
155	0605013M	Information Technology Development	05	U	10,854	11,361		11,361	22,663
156	0605013N	Information Technology Development	05	U	261,195	318,103		318,103	282,138
157	0605024N	Anti-Tamper Technology Support	05	U	8,393	7,271		7,271	8,340
158	0605180N	TACAMO Modernization	05	U	48,644	502,493		502,493	213,743
159	0605212M	CH-53K RDTE	05	U	212,181	220,240		220,240	222,288
160	0605215N	Mission Planning	05	U	86,255	76,107		76,107	86,448
161	0605217N	Common Avionics	05	U	52,789	77,960		77,960	81,076
162	0605220N	Ship to Shore Connector (SSC)	05	U	6,295	17,886		17,886	1,343
163	0605327N	T-AO 205 Class	05	U	4,287	220		220	71
164	0605414N	Unmanned Carrier Aviation (UCA)	05	U	257,887	254,446		254,446	220,404
165	0605450M	Joint Air-to-Ground Missile (JAGM)	05	U	345	371		371	384
166	0605500N	Multi-mission Maritime Aircraft (MMA)	05	U	28,842	37,939		37,939	36,027
167	0605504N	Multi-Mission Maritime (MMA) Increment III	05	U	157,793	161,697		161,697	132,449
168	0605611M	Marine Corps Assault Vehicles System Development & Demonstration	05	U	71,237	91,501		91,501	103,236
169	0605813M	Joint Light Tactical Vehicle (JLTV) System Development & Demonstration	05	U	1,921	2,856		2,856	2,609
170	0204202N	DDG-1000	05	U	110,789	180,374		180,374	231,778

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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171	0301377N	Countering Advanced Conventional Weapons (CACW)	05	U		12,341		12,341	17,531
172	0304785N	ISR & Info Operations	05	U	135,538	135,252		135,252	174,271
173	0306250M	Cyber Operations Technology Development	05	U	23,299	37,038		37,038	2,068
		System Development & Demonstration			5,308,050	6,472,604		6,472,604	6,962,234
174	0604256N	Threat Simulator Development	06	U	56,311	29,430		29,430	22,918
175	0604258N	Target Systems Development	06	U	19,553	73,708		73,708	18,623
176	0604759N	Major T&E Investment	06	U	95,451	141,371		141,371	74,221
177	0605152N	Studies and Analysis Support - Navy	06	U	3,069	3,286		3,286	3,229
178	0605154N	Center for Naval Analyses	06	U	34,686	37,685		37,685	45,672
179	0605502N	Small Business Innovative Research	06	U	531,825				
180	0605804N	Technical Information Services	06	U	1,562	987		987	1,000
181	0605853N	Management, Technical & International Support	06	U	104,950	109,565		109,565	124,328
182	0605856N	Strategic Technical Support	06	U	3,402	3,787		3,787	4,053
183	0605863N	RDT&E Ship and Aircraft Support	06	U	135,097	173,352		173,352	203,447
184	0605864N	Test and Evaluation Support	06	U	444,883	479,281		479,281	481,975
185	0605865N	Operational Test and Evaluation Capability	06	U	25,326	27,808		27,808	29,399
186	0605866N	Navy Space and Electronic Warfare (SEW) Support	06	U	17,238	27,172		27,172	27,504
187	0605867N	SEW Surveillance/Reconnaissance Support	06	U	8,065	7,186		7,186	9,183
188	0605873M	Marine Corps Program Wide Support	06	U	42,480	39,744		39,744	34,976

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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Line No	Program Element Number	Item	Act	Se c	FY 2022 Actuals	FY 2023 Less Supplementals Enacted	FY 2023 Supplementals Enacted*	FY 2023 Total Enacted	FY 2024 Request
189	0605898N	Management HQ - R&D	06	U	35,018	40,648		40,648	41,331
190	0606355N	Warfare Innovation Management	06	U	38,066	52,060		52,060	37,340
191	0305327N	Insider Threat	06	U	2,482	2,315		2,315	2,246
192	0902498N	Management Headquarters (Departmental Support Activities)	06	U	1,747	1,811		1,811	2,168
193	0909980N	Judgment Fund Reimbursement	06	U	579				
194	0909999N	Financing for Cancelled Account Adjustments	06	U	877				
	Management Support				1,602,667	1,251,196		1,251,196	1,163,613
196	0604840M	F-35 C2D2	07	U	501,609	531,032		531,032	544,625
197	0604840N	F-35 C2D2	07	U	473,749	503,365		503,365	543,834
198	0605520M	MARINE CORPS AIR DEFENSE WEAPONS SYSTEMS	07	U	59,018	69,663		69,663	99,860
199	0607658N	Cooperative Engagement Capability (CEC)	07	U	148,628	156,121		156,121	153,440
200	0101221N	Strategic Sub & Weapons System Support	07	U	190,928	312,502		312,502	321,648
201	0101224N	SSBN Security Technology Program	07	U	44,212	50,761		50,761	62,694
202	0101226N	Submarine Acoustic Warfare Development	07	U	58,645	81,237		81,237	92,869
203	0101402N	Navy Strategic Communications	07	U	34,474	49,424		49,424	51,919
204	0204136N	F/A-18 Squadrons	07	U	213,010	235,204		235,204	333,783
205	0204228N	Surface Support	07	U	13,195	12,197		12,197	8,619
206	0204229N	Tomahawk and Tomahawk Mission Planning Center (TMPC)	07	U	129,919	122,719		122,719	122,834
207	0204311N	Integrated Surveillance System	07	U	83,349	98,370		98,370	76,279
208	0204313N	Ship-Towed Array Surveillance Systems	07	U	6,080	1,188		1,188	1,103

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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Line No	Program Element Number	Item	Act	Se c	FY 2022 Actuals	FY 2023 Less Supplementals Enacted	FY 2023 Supplementals Enacted*	FY 2023 Total Enacted	FY 2024 Request
209	0204413N	Amphibious Tactical Support Units (Displacement Craft)	07	U	1,650	1,789		1,789	1,991
210	0204460M	Ground/Air Task Oriented Radar (G/ATOR)	07	U	43,761	61,104		61,104	92,674
211	0204571N	Consolidated Training Systems Development	07	U	53,099	100,339		100,339	115,894
212	0204575N	Electronic Warfare (EW) Readiness Support	07	U	53,412	45,936		45,936	61,677
213	0205601N	Anti-Radiation Missile Improvement	07	U	133,315	89,479		89,479	59,555
214	0205620N	Surface ASW Combat System Integration	07	U	27,781	28,999		28,999	29,973
215	0205632N	MK-48 ADCAP	07	U	98,707	155,868		155,868	213,165
216	0205633N	Aviation Improvements	07	U	140,478	149,450		149,450	143,277
217	0205675N	Operational Nuclear Power Systems	07	U	113,760	121,439		121,439	152,546
218	0206313M	Marine Corps Communications Systems	07	U	105,494	114,264		114,264	192,625
219	0206335M	Common Aviation Command and Control System (CAC2S)	07	U	12,503	14,865		14,865	12,565
220	0206623M	Marine Corps Ground Combat/Supporting Arms Systems	07	U	84,344	106,036		106,036	83,900
221	0206624M	Marine Corps Combat Services Support	07	U	20,254	26,522		26,522	27,794
222	0206625M	USMC Intelligence/Electronic Warfare Systems (MIP)	07	U	38,089	51,976		51,976	47,762
223	0206629M	Amphibious Assault Vehicle	07	U	7,475	8,246		8,246	373
224	0207161N	Tactical AIM Missiles	07	U	23,273	29,236		29,236	36,439
225	0207163N	Advanced Medium Range Air-to-Air Missile (AMRAAM)	07	U	31,776	30,898		30,898	29,198
226	0208043N	Planning and Decision Aid System (PDAS)	07	U	2,982	3,609		3,609	3,565

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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Line No	Program Element Number	Item	Act	Se c	FY 2022 Actuals	FY 2023 Less Supplementals Enacted	FY 2023 Supplementals Enacted*	FY 2023 Total Enacted	FY 2024 Request
230	0303138N	Afloat Networks	07	U	36,259	45,683		45,683	49,995
231	0303140N	Information Systems Security Program	07	U	32,592	33,752		33,752	33,390
232	0305192N	Military Intelligence Program (MIP) Activities	07	U	7,513	8,415		8,415	7,304
233	0305204N	Tactical Unmanned Aerial Vehicles	07	U	9,837	10,576		10,576	11,235
234	0305205N	UAS Integration and Interoperability	07	U	4,842	15,396		15,396	16,409
235	0305208M	Distributed Common Ground/Surface Systems	07	U	29,749	45,705		45,705	51,192
236	0305220N	MQ-4C Triton	07	U	13,029	13,893		13,893	12,094
237	0305231N	MQ-8 UAV	07	U	33,543	27,000		27,000	29,700
238	0305232M	RQ-11 UAV	07	U	533	1,234		1,234	2,107
239	0305234N	Small (Level 0) Tactical UAS (STUASL0)	07	U	1,772	3,761		3,761	2,999
240	0305241N	Multi-Intelligence Sensor Development	07	U	59,252	56,261		56,261	49,460
241	0305242M	Unmanned Aerial Systems (UAS) Payloads (MIP)	07	U	9,274	9,780		9,780	13,005
242	0305251N	Cyberspace Operations Forces and Force Support	07	U	34,977	36,505		36,505	2,000
243	0305421N	RQ-4 Modernization	07	U	134,323	150,093		150,093	300,378
244	0307577N	Intelligence Mission Data (IMD)	07	U	907	851		851	788
245	0308601N	Modeling and Simulation Support	07	U	9,479	9,437		9,437	10,994
246	0702207N	Depot Maintenance (Non-IF)	07	U	33,870	26,248		26,248	23,248
247	0708730N	Maritime Technology (MARITECH)	07	U	6,095	2,133		2,133	3,284
248	1203109N	Satellite Communications (SPACE)	07	U	596				
999	999999999	Classified Programs	07	U	2,136,820	2,361,311	40,577	2,401,888	2,021,376

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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Appropriation: 1319N Research, Development, Test and Evaluation, Navy

Line No	Program Element Number	Item	Act	Se c	FY 2022 Actuals	FY 2023 Less Supplementals Enacted	FY 2023 Supplementals Enacted*	FY 2023 Total Enacted	FY 2024 Request
		Operational Systems Development			5,544,231	6,221,872	40,577	6,262,449	6,359,438
249	0608013N	Risk management Information - Software Pilot Program	08	U	13,565	12,810		12,810	11,748
250	0608231N	Maritime Tactical Command and Control (MTC2) - Software Pilot Program	08	U	15,563	11,198		11,198	10,555
		Software And Digital Technology Pilot Programs			29,128	24,008		24,008	22,303
		Total Research, Development, Test and Evaluation, Navy			22,032,867	26,003,697	40,577	26,044,274	26,922,225

*Includes enacted funding in the Ukraine Supplemental Appropriation Act, 2023 (Division B of Public Law 117-180) and Additional Ukraine Supplemental Appropriation Act, 2023 (Division M of Public Law 117-328).

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<u>Appropriation</u>	FY 2023	FY 2024
	Overseas	Overseas
	Operations	Operations
	Costs (OOC) *	Costs (OOC) *
Research, Development, Test and Evaluation, Navy		15
Total Research, Development, Test, & Evaluation		15

*FY 2023 and FY 2024 Overseas Operations Costs (OOC) numbers are a subset of the baseline submission.

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	FY 2023 Overseas Operations Costs (OOC) *	FY 2024 Overseas Operations Costs (OOC) *
<hr/>		
<u>Summary Recap of Budget Activities</u>		
Advanced Component Development & Prototypes		15
Total Research, Development, Test, & Evaluation		15
<u>Summary Recap of FYDP Programs</u>		
Research and Development		15
Total Research, Development, Test, & Evaluation		15

*FY 2023 and FY 2024 Overseas Operations Costs (OOC) numbers are a subset of the baseline submission.

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	FY 2023 Overseas Operations Costs (OOC) *	FY 2024 Overseas Operations Costs (OOC) *
<hr/>		
<u>Summary Recap of Budget Activities</u>		
Advanced Component Development & Prototypes		15
Total Research, Development, Test, & Evaluation		15
 <u>Summary Recap of FYDP Programs</u>		
Research and Development		15
Total Research, Development, Test, & Evaluation		15

*FY 2023 and FY 2024 Overseas Operations Costs (OOC) numbers are a subset of the baseline submission.

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Appropriation: 1319N Research, Development, Test and Evaluation, Navy

Line No	Program Element Number	Item	Act	Se c	FY 2023 Overseas Operations Costs (OOC) *	FY 2024 Overseas Operations Costs (OOC) *
70	0603795N	Land Attack Technology	04	U		15
		Other		U		15
		Advanced Component Development & Prototypes				15
Total Research, Development, Test and Evaluation, Navy						15

*FY 2023 and FY 2024 Overseas Operations Costs (OOC) numbers are a subset of the baseline submission.

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Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603128N / Unmanned Aerial System							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	15.545	98.883	108.225	-	108.225	111.698	42.137	24.745	25.294	Continuing	Continuing
3448: Marine Group 5 UAS Development	0.000	15.545	96.883	108.225	-	108.225	111.698	42.137	24.745	25.294	Continuing	Continuing
9999: Congressional Adds	0.000	0.000	2.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.000

Note

The FY 2024 MALE program funding addresses Tier 1 capability gaps identified in the October 2016 MUX ICD and April 2020 MUX Requirements Clarification document.

A. Mission Description and Budget Item Justification

Project 3448 - The first Marine Air Ground Task Force (MAGTF) Unmanned Aircraft System (UAS) Expeditionary (MUX) Family of Systems (FoS) element is Medium-Altitude, Long-Endurance (MALE), a land-based Group 5 UAS based on the MQ-9A weapon system.

MALE provides Intelligence, Surveillance and Reconnaissance (ISR) in support of Expeditionary Advanced Base Operations (EABO), Littoral Operations in Contested Environments (LOCE), and Distributed Maritime Operations (DMO) and an advanced, unmanned, multi-mission capability for the MAGTF and Marine Littoral Regiment (MLR).

MALE will award contracts for initial MQ-9A mission capabilities (payloads/sensors) design, development and integration with payloads supporting Tier 1 mission capabilities. Payload/sensor capabilities consists of Common Operating and Intelligence Picture (COP/CIP) development and integration, Detect And Avoid System (DAAS), Airborne Network Extension (ANE) / SkyTower II, Electronic Warfare (EW) (previously RDESS/SOAR), Maritime Domain Awareness (MDA) (previously Airborne Early Warning), and Proliferated Low Earth Orbit (PLEO).

The USMC MALE program will be supported by UX-24 as the primary test activity/squadron for capability development as well as system modification validation efforts. UX-24 will provide direct support of testing associated with payloads/sensors in support of USMC requirements. The payloads/sensors which undergo testing may require or drive hardware and software modifications during testing to satisfy system, subsystem and component level test parameters.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0603128N / Unmanned Aerial System			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	16.167	96.883	92.085	-	92.085
Current President's Budget	15.545	98.883	108.225	-	108.225
Total Adjustments	-0.622	2.000	16.140	-	16.140
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	2.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.622	0.000			
• Program Adjustments	0.000	0.000	15.689	-	15.689
• Rate/Misc Adjustments	0.000	0.000	0.451	-	0.451
Congressional Add Details (\$ in Millions, and Includes General Reductions)				FY 2022	FY 2023
Project: 9999: Congressional Adds					
Congressional Add: Autonomous maritime patrol aircraft				0.000	2.000
Congressional Add Subtotals for Project: 9999				0.000	2.000
Congressional Add Totals for all Projects				0.000	2.000
Change Summary Explanation					
Funding: FY24 funding request was increased by \$16.140M due to the acceleration of the Maritime Domain Awareness (MDA) sensor capability.					
Schedule changes from PB23 to PB24:					
-SkyTower II / ANE development schedule started later in FY22 due to contract award delay with multiple competing vendors. Development completion extended to 1QFY25 due to updated vendor execution plan accounting for delayed contract award in 4QFY22.					
-AEW renamed to MDA for consistency in nomenclature across government and industry partners. Development timeline extended to align to USAF and vendor partnership efforts required as predecessors to MUX/MALE integration of the MDA payload.					
-RDESS/SOAR EW label truncated to EW for standardization across development partners.					
-DAAS development timeline extended to align with partner developer Air National Guard (ANG) and follow-on NAVAIR airworthiness certification.					
-PLEO development timeline added to reflect focused effort on enabling capability to SkyTower II. PLEO is a subcomponent of the SkyTower II budget; previously only represented by the SkyTower II timeline.					
-Thresher / Common Operating Picture development timeline added to reflect focused effort on enabling capability to EW. Thresher is a subcomponent of the EW budget; previously only represented by the EW timeline.					
-Test and Evaluation Activities timeline in PB23 schedule integrated into each of the payload development timelines for the PB24 schedule.					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603128N I Unmanned Aerial System	
<p>-Production Air Vehicles timeline removed as it is not part of Increment II development (RDTE) for MUX/MALE. It is a production activity in Increment I funded by APN-4.</p> <p>-MALE Increment I EOC milestone removed as it is not part of Increment II development (RDTE) for MUX/MALE. It is a production activity in Increment I funded by APN-4.</p> <p>-Kit/pod procurements added to align with modification program</p> <p>-MALE Increment I IOC milestone removed and replaced with IOC to represent Increment II IOC for MUX/MALE.</p> <p>Technical: N/A</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603128N / <i>Unmanned Aerial System</i>				Project (Number/Name) 3448 / <i>Marine Group 5 UAS Development</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3448: <i>Marine Group 5 UAS Development</i>	0.000	15.545	96.883	108.225	-	108.225	111.698	42.137	24.745	25.294	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The FY24 MALE program funding, PE 0603128N, addresses Tier 1 capability gaps identified in the October 2016 MUX ICD and April 2020 MUX Requirements Clarification document.

Project 3448 - The first Marine Air Ground Task Force (MAGTF) Unmanned Aircraft System (UAS) Expeditionary (MUX) Family of Systems (FoS) element is Medium-Altitude, Long-Endurance (MALE), a land-based Group 5 UAS based on the MQ-9A weapon system.

MALE provides Intelligence, Surveillance and Reconnaissance (ISR) in support of Expeditionary Advanced Base Operations (EABO), Littoral Operations in Contested Environments (LOCE), and Distributed Maritime Operations (DMO) and an advanced, unmanned, multi-mission capability for the MAGTF and Marine Littoral Regiment.

MALE will award contracts for initial MQ-9A mission capabilities (payloads/sensors) design, development and integration with payloads supporting Tier 1 mission capabilities. Payload/sensor capabilities consists of Common Operating and Intelligence Picture (COP/CIP) development and integration, Detect And Avoid System (DAAS), Airborne Network Extension (ANE) / SkyTower II, Electronic Warfare (EW), Maritime Domain Awareness (MDA), Proliferated Low Earth Orbit (PLEO).

The USMC MALE program will be supported by UX-24 as the primary test activity/squadron for capability development as well as system modification validation efforts. UX-24 will provide direct support of testing associated with payloads/sensors in support of USMC requirements. The payloads/sensors which undergo testing may require or drive hardware and software modifications during testing to satisfy system, subsystem and component level test parameters.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: MALE Primary Hardware/Software Development/Integration	14.215	65.712	72.419	0.000	72.419
Articles:	-	-	-	-	-
Description: Funding supports the development and integration of mission system payloads supporting medium altitude long endurance concept identified within the MUX Initial Capabilities Document (ICD).					
FY 2023 Plans: MALE will initiate contract award for MQ-9A capability and payload development, capability integration studies, design work, technical requirements generation and full integration of sensors into the system.					
FY 2024 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603128N / Unmanned Aerial System		Project (Number/Name) 3448 / Marine Group 5 UAS Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
MALE will support MQ-9A capability and payloads/sensors primary hardware development, Non-Recurring Engineering (NRE), capability integration studies, design work and Air Vehicle and Ground Control Station integration. MALE will also support programmatic, engineering, logistics, technical requirements generation, development test and full integration of payloads/sensors into the system. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: FY24 increased by \$6.707 due to the acceleration of development and integration, Detect and Avoid System (DAAS), Airborne Network Extension (ANE) / SkyTower II, Electronic Warfare (EW), Maritime Domain Awareness (MDA), Proliferated Low Earth Orbit (PLEO).						
Title: MALE Program Support Articles: Description: Funding provided for support costs associated with mission system payloads supporting medium altitude long endurance concept identified within the MUX Initial Capabilities Document (ICD). FY 2023 Plans: Program, engineering and logistics support for contract award for MQ-9A capability and payload development, capability integration studies, design work, technical requirements generation and full integration of sensors into the system. FY 2024 Base Plans: Program, engineering and logistics support for contract award for MQ-9A capability and payload development, capability integration studies, design work, technical requirements generation and full integration of sensors into the system. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: FY24 Management Services increased by \$4.217 to support the development of the four (4) primary sensor capabilities for the MALE program. These services support the prime vendors with overall systems development for air vehicle and sensor capability packages. Additionally, the increase funds government and contractor		0.091 -	16.197 -	20.414 -	0.000 -	20.414 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy									Date: March 2023		
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603128N / Unmanned Aerial System			Project (Number/Name) 3448 / Marine Group 5 UAS Development				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)							FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
support, along with travel to support MALE Mission Sensors development and integration across sensor systems.											
Title: MALE Developmental and Operational Test							1.239	14.974	15.392	0.000	15.392
Articles:							-	-	-	-	-
Description: Funding supports the development and operational testing of mission system payloads supporting medium altitude long endurance concept identified within the MUX Initial Capabilities Document (ICD).											
FY 2023 Plans:											
FY23 Test plan consists of Environmental Electronic Effects, Electro Magnetic Interference, P-Static (Precipitation Static) Condition, Electromagnetic Radiation Hazards Testing, Emitter verification Direct Inject ID and Geolocation, Sensitivity testing of DAAS pod, EW, AEW sensor, and SkyTower II ANE pod.											
FY 2024 Base Plans:											
FY24 Test plan consists of Environmental Electronic Effects, Electro Magnetic Interference, P-Static (Precipitation Static) Condition, Electromagnetic Radiation Hazards Testing, Emitter verification Direct Inject ID and Geolocation, Sensitivity testing of DAAS pod, EW, MDA sensor, and ANE/SkyTower II pod.											
FY 2024 OCO Plans:											
N/A											
FY 2023 to FY 2024 Increase/Decrease Statement:											
FY24 increased by \$.418M to support required system level development and testing for the integration of mission system payloads on MALE.											
Accomplishments/Planned Programs Subtotals							15.545	96.883	108.225	0.000	108.225
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• APN/0452: Marine Group 5 UAS (MALE)	272.666	103.882	89.563	-	89.563	15.519	10.460	11.059	11.457	0.000	514.606
• APN/0507: Marine Group 5 UAS (MALE) Mods	1.982	86.116	98.063	-	98.063	157.964	193.207	166.395	64.147	1.500	769.374
Remarks											

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603128N / <i>Unmanned Aerial System</i>	Project (Number/Name) 3448 / <i>Marine Group 5 UAS Development</i>

D. Acquisition Strategy

The MALE sensor acquisition strategy leverages existing developmental programs with mature technology readiness level (TRL) Airborne Network Extension (ANE) / SkyTower II, Maritime Domain Awareness (MDA), Electronic Warfare (EW), and Detect And Avoid System (DAAS) capabilities for transition and integration on the MQ-9A UAS. The MALE capabilities (payloads/sensor) acquisition strategy uses organic government resources, competitive and sole-source contract awards, and assisted acquisition approaches to develop, integrate, and acquire the discrete capabilities.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603128N / <i>Unmanned Aerial System</i>				Project (Number/Name) 3448 / <i>Marine Group 5 UAS Development</i>					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Development (Hardware/Software) Detect and Avoid System (DAAS)	C/CPIF	General Atomics : Various	0.000	0.357	Sep 2022	6.821	Apr 2023	5.572	May 2024	-		5.572	0.000	12.750	23.937
Primary Development (Hardware/Software) Airborne Network Extension (ANE) / SkyTower II pod	C/FFP	TBD : TBD	0.000	6.514	Sep 2022	12.923	Apr 2023	11.500	Apr 2024	-		11.500	7.887	38.824	-
Primary Development (Hardware/Software) Electronic Warfare	C/CPIF	General Atomics/L3 : Various	0.000	0.850	Sep 2022	17.400	Mar 2023	5.000	May 2024	-		5.000	Continuing	Continuing	Continuing
Primary Development (Hardware/Software) Maritime Domain Awareness (MDA)	C/BA	TBD : TBD	0.000	0.000		9.000	Aug 2023	23.289	Jun 2024	-		23.289	2.789	35.078	-
DAAS Sensor Integration	C/CPIF	General Atomics : Various	0.000	0.000		2.000	May 2023	1.704	Feb 2024	-		1.704	0.704	4.408	11.127
Airborne Network Extension (ANE) / SkyTower II Integration	C/FFP	TBD : TBD	0.000	0.000		3.608	Apr 2023	12.749	May 2024	-		12.749	46.342	62.699	-
Electronic Warfare (EW) Integration	C/CPIF	General Atomics/L3 : Various	0.000	0.000		11.960	Mar 2023	3.387	Mar 2024	-		3.387	3.962	19.309	-
Maritime Domain Awareness (MDA) Integration	Various	TBD : TBD	0.000	0.000		0.000		3.818	Jun 2024	-		3.818	4.930	8.748	-
Primary Development / Integration Tactical Common Operating Picture / Talon Thresher	C/CPIF	General Atomics : Various	0.000	0.856	Sep 2022	0.000		0.000		-		0.000	0.000	0.856	-
Primary Development (Hardware/Software) PLEO	TBD	General Atomics : Various	0.000	0.000		2.000	May 2023	5.400	Jun 2024	-		5.400	0.000	7.400	-
Subtotal			0.000	8.577		65.712		72.419		-		72.419	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603128N / Unmanned Aerial System				Project (Number/Name) 3448 / Marine Group 5 UAS Development					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks FY24 increase by \$6.707 is due to the of planned hardware development efforts for Airborne Network Extension (ANE)/SkyTower II and MDA. Note: Updates to nomenclature from AEW to MDA, RDESS/SOAR to EW and Global Lightning to PLEO to align to capabilities in development.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Various	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Engineering Support	Various	Various : Various	0.000	1.756	Mar 2022	4.000	Apr 2023	3.549	Apr 2024	-		3.549	0.000	9.305	-
Integrated Logistics Support	Various	Various : Various	0.000	0.123	Mar 2022	5.695	Apr 2023	9.733	Apr 2024	-		9.733	3.495	19.046	-
Subtotal			0.000	1.879		9.695		13.282		-		13.282	3.495	28.351	N/A
Remarks FY24 funding increased by \$3.587 for Engineering Support and Integrated Logistics Support (ILS) costs to support the integration of four sensor capabilities on the MALE program.															
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	Various	Various : Various	0.000	0.000		6.502	Jan 2023	7.132	Jan 2024	-		7.132	44.490	58.124	-
Subtotal			0.000	0.000		6.502		7.132		-		7.132	44.490	58.124	N/A
Remarks FY24 funding increased by \$0.630 to support required system level development and testing for the costs to support the integration of four sensor capabilities on the MALE program.															

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PE 0603128N: *Unmanned Aerial System*
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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

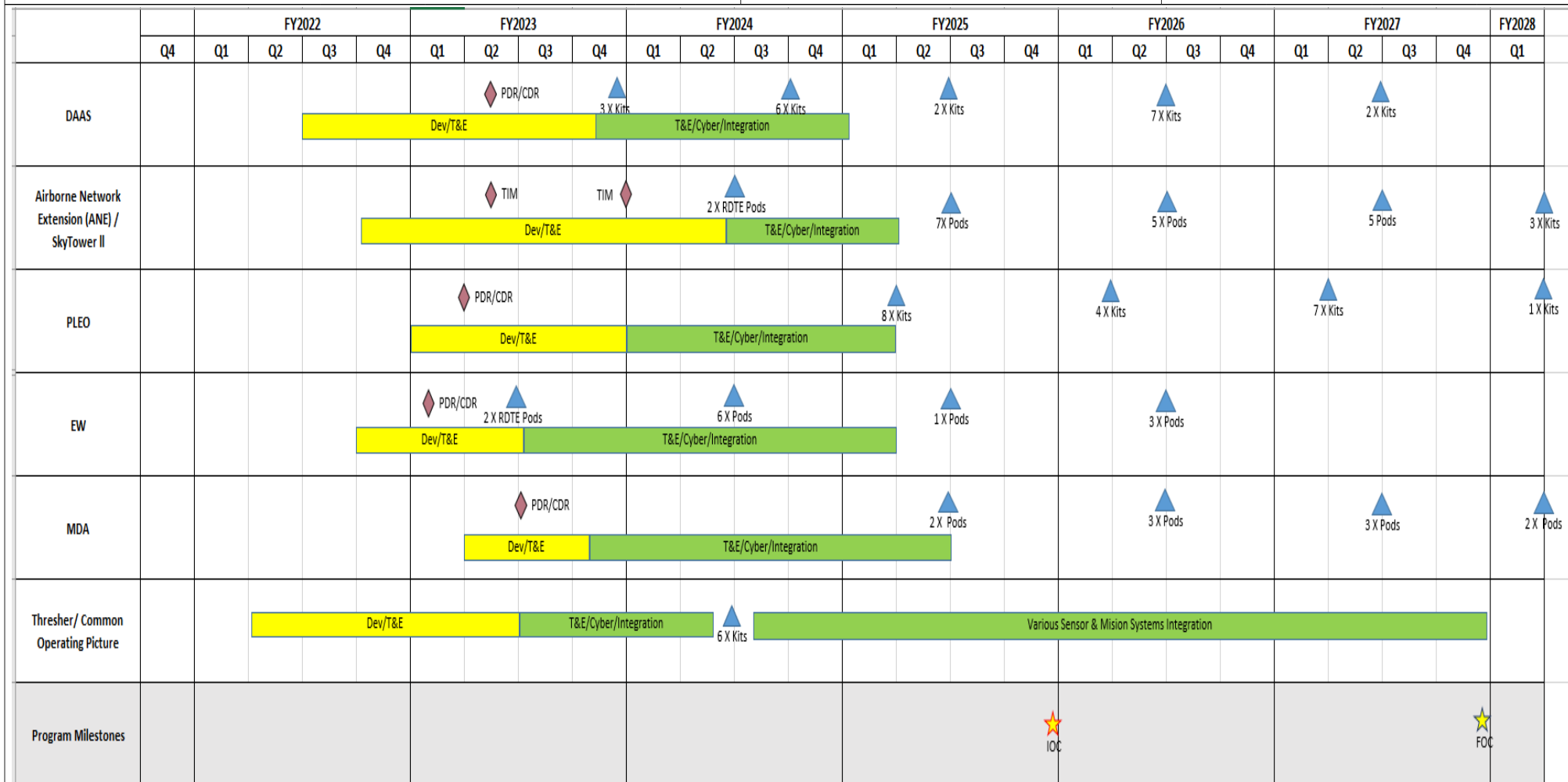
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R-1 Program Element (Number/Name)

PE 0603128N / Unmanned Aerial System

Project (Number/Name)

3448 / Marine Group 5 UAS Development



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

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R-1 Program Element (Number/Name)

PE 0603128N / *Unmanned Aerial System*

Project (Number/Name)

3448 / *Marine Group 5 UAS Development*

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3448				
System Development Activities: Detect and Avoid System (DAAS)	3	2022	4	2023
System Development Activities: Airborne Network Extension (ANE) / SkyTower II	4	2022	2	2024
System Development Activities: PLEO	1	2023	1	2024
System Development Activities: Electronic Warfare (EW) sensor production	4	2022	3	2023
System Development Activities: Maritime Domain Awareness (MDA) Sensor integration	2	2023	4	2023
System Development Activities: Thresher / Common Operating Picture	2	2022	3	2023
Test and Evaluation Activities: Detect and Avoid System (DAAS)	4	2023	1	2025
Test and Evaluation Activities: Airborne Network Extension (ANE) / SkyTower II	2	2024	2	2025
Test and Evaluation Activities: Airborne Network Extension (ANE) / SkyTower II RDT&E Pods	3	2024	3	2024
Test and Evaluation Activities: PLEO	1	2024	2	2025
Test and Evaluation Activities: Electronic Warfare (EW)	3	2023	2	2025
Test and Evaluation Activities: Electronic Warfare (EW) sensor production RDT&E Pods	3	2023	3	2023
Test and Evaluation Activities: Maritime Domain Awareness (MDA) Sensor integration	4	2023	3	2025
Test and Evaluation Activities: Thresher / Common Operating Picture	3	2023	4	2027
Production Milestones: Detect and Avoid System (DAAS) Lot 1	4	2023	4	2023
Production Milestones: Detect and Avoid System (DAAS) Lot 2	4	2024	4	2024
Production Milestones: Detect and Avoid System (DAAS) Lot 3	3	2025	3	2025
Production Milestones: Detect and Avoid System (DAAS) Lot 4	3	2026	3	2026
Production Milestones: Detect and Avoid System (DAAS) Lot 5	3	2027	3	2027
Production Milestones: Airborne Network Extension (ANE) / SkyTower II Lot 1	3	2025	3	2025

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

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R-1 Program Element (Number/Name)

PE 0603128N / Unmanned Aerial System

Project (Number/Name)

3448 / Marine Group 5 UAS Development

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Production Milestones: Airborne Network Extension (ANE) / SkyTower II Lot 2	3	2026	3	2026
Production Milestones: Airborne Network Extension (ANE) / SkyTower II Lot 3	3	2027	3	2027
Production Milestones: Airborne Network Extension (ANE) / SkyTower II Lot 4	2	2028	2	2028
Production Milestones: PLEO Lot 1	2	2025	2	2025
Production Milestones: PLEO Lot 2	2	2026	2	2026
Production Milestones: PLEO Lot 3	2	2027	2	2027
Production Milestones: PLEO Lot 4	2	2028	2	2028
Production Milestones: Electronic Warfare (EW) sensor production Lot 1	2	2024	2	2024
Production Milestones: Electronic Warfare (EW) sensor production Lot 2	3	2025	3	2025
Production Milestones: Electronic Warfare (EW) sensor production Lot 3	3	2026	3	2026
Production Milestones: Maritime Domain Awareness (MDA) Lot 1	2	2025	2	2025
Production Milestones: Maritime Domain Awareness (MDA) Lot 2	3	2026	3	2026
Production Milestones: Maritime Domain Awareness (MDA) Lot 3	3	2027	3	2027
Production Milestones: Maritime Domain Awareness (MDA) Lot 4	2	2028	2	2028
Production Milestones: Thresher / Common Operating Picture Lot 1	2	2024	2	2024
MALE Program Milestones: Initial Operational Capability (IOC)	4	2025	4	2025
MALE Program Milestones: Full Operational Capability (FOC)	4	2027	4	2027
MALE Program Milestones: Detect and Avoid System (DAAS) PDR/CDR	2	2023	2	2023
MALE Program Milestones: ANE / SkyTower II TIM1	2	2023	2	2023
MALE Program Milestones: ANE / SkyTower II TIM 2	1	2022	1	2022
MALE Program Milestones: PLEO PDR/CDR	2	2023	2	2023
MALE Program Milestones: Electronic Warfare (EW) sensor PDR/CDR	1	2023	1	2023
MALE Program Milestones: Maritime Domain Awareness (MDA) Sensor PDR/CDR	3	2023	3	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603128N / <i>Unmanned Aerial System</i>				Project (Number/Name) 9999 / <i>Congressional Adds</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	0.000	0.000	2.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Autonomous Maritime Patrol Aircraft (AMPA) project provides funding to address capability gaps identified in the 2025 Fleet and COCOM Integrated Priority Lists (IPLs), including a need for persistent Command, Control, and Communications (C3) and Intelligence, Surveillance, and Reconnaissance (ISR) capabilities. This ultra-long endurance (ULE) solar-powered unmanned aerial system (UAS) is executing Phase 1 of a Joint Capability Technology Demonstration (JCTD). At the culmination of the JCTD, the AMPA demonstration variant of the aircraft is intended to have a 90+ day endurance, up to an 800-pound payload capacity, and enough electrical power available (target goal is 2kW) to simultaneously operate a suite of C3 and ISR payloads.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023
<i>Congressional Add:</i> Autonomous maritime patrol aircraft	0.000	2.000
<i>FY 2022 Accomplishments:</i> N/A		
<i>FY 2023 Plans:</i> Planned efforts include conducting design refinement activities, systems engineering, architecture studies, sustainment analysis, and fleet experimentation to inform future integration approaches and decisions for platform, payload, autonomous mission control capabilities, ground control stations, networking and communications infrastructure development.		
Congressional Adds Subtotals	0.000	2.000

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

The AMPA acquisition strategy leverages completion of the ongoing JCTD and experimentation to inform future Fleet capability delivery model. Initial delivery models under analysis include Contractor Owned/Contractor Operated (COCO) or Government Owned/ Contractor Operated (GOCO) operations; or appropriate milestone insertion into a traditional program of record. Additionally, future AMPA Mission System Payloads will leverage other services and government agencies with current technologies in development and will be available at a relatively mature technology.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603128N / Unmanned Aerial System				Project (Number/Name) 9999 / Congressional Adds					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Payload Integration/ Experimentation events	Various	Various : Various	0.000	0.000		1.170	Jul 2023	0.000		-		0.000	0.000	1.170	-
Subtotal			0.000	0.000		1.170		0.000		-		0.000	0.000	1.170	N/A
Remarks FY23 increase of \$1.17 supports product development for the transition of the developed the Autonomous Maritime Patrol Aircraft (AMPA).															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Various	Various : Various	0.000	0.000		0.830	Jul 2023	0.000		-		0.000	0.000	0.830	-
Subtotal			0.000	0.000		0.830		0.000		-		0.000	0.000	0.830	N/A
Remarks FY23 increase of \$0.830 supports management services for the transition of the Autonomous Maritime Patrol Aircraft (AMPA).															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		2.000		0.000		-		0.000	0.000	2.000	N/A
Remarks JCTD Phase 1 and Phase 2 in progress, currently supported with OSD Research and Engineering funding.															

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9999 / Congressional Adds

Proj 9999	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
System Development Activities							Fleet Payload Dev & Integration																					
Test and Evaluation Activities						JCTD Ph1																						
						JCTD Ph2			FLEX/ Op Demos																			
																					</							

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603128N / <i>Unmanned Aerial System</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 9999</i>				
System Development Activities: Fleet Payload Dev & Integration	3	2023	4	2024
Test and Evaluation Activities: JCTD Ph1	2	2023	2	2023
Test and Evaluation Activities: JCTD Ph2	2	2023	4	2023
Test and Evaluation Activities: FLEX/ Op Demos	1	2024	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603178N / (U)LARGE UNMANNED SURFACE VESSELS (LUSVs)							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	67.517	98.871	136.580	117.400	-	117.400	127.855	127.006	129.431	131.729	Continuing	Continuing
3066: Large Unmanned Surface Vessel (LUSV)	67.517	98.871	136.580	117.400	-	117.400	127.855	127.006	129.431	131.729	Continuing	Continuing

Note

Large Unmanned Surface Vessel (LUSV) (Proj 3066) and Unmanned Surface Vehicle (USV) Enabling Capabilities (Proj 3067) were new starts in FY 2020. FY 2020 funding in Program Element (PE) 0603502N. LUSV and USV Enabling Capabilities realigned from PE 0603502N to PE 0603178N in FY 2021.

In FY 2022, the Navy realigned funding for USV Enabling Capabilities (Proj 3067) from PE 0603178N to new PE 0605513N. Concurrent with the shift to separate Program Elements, the Navy has rebalanced the FY 2022 RDTEN profile, shifting C4I non-recurring engineering and autonomy development funding that can be applied to both the LUSV and MUSV programs into the USV Enabling Capabilities PE 0605513N. For FY2023, the Navy realigned funding for development of the Unmanned Surface Vessel Integrated Combat System Development (USV ICS) to PE 0605513N, reflecting the Navy's vision of eventually fielding the USV ICS across all unmanned surface platforms. Hardware and platform-specific USV ICS requirements for LUSV and Overlord prototypes remain in LUSV PE 0603178N.

A. Mission Description and Budget Item Justification

This Program Element provides resources for the Large Unmanned Surface Vessel (LUSV), one of the two unmanned platforms in the Navy's Future Surface Combatant Force (FSCF). This Program Element also provides resources for the Overlord research and development prototype vessels. LUSVs will provide affordable, high endurance ships able to accommodate various payloads for unmanned missions and augment the Navy's manned surface force. LUSVs will be capable of semi-autonomous operation, with operators in-the-loop or on-the-loop. USV Command and Control (C2) will be maintained via an afloat element (i.e., embarked on a United States Navy (USN) combatant/other assigned afloat asset) or via an ashore element (C2 station ashore). While MUSV (PE 0605512N) and LUSV will logically share common Government Furnished Equipment (GFE) C2 systems to support fleet integration and operations and may share other autonomy and mechanical technologies (depending on acquisition approaches), they will be primarily differentiated by size and cost driven by payload capabilities, and capacities.

LUSV is a key enabler of the Navy's Distributed Maritime Operations (DMO) concept, which includes being able to forward deploy and team with individual manned combatants or augment battle groups. LUSV will complement the Navy's manned combatant force by delivering increased readiness, capability and needed capacity at lower procurement and sustainment costs and reduced risk to sailors. While unmanned surface vehicles are new additions to the fleet units, LUSV will combine robust and proven commercial vessel specifications with existing military payloads to rapidly and affordably expand the capacity and capability of the surface fleet.

The Large Unmanned Surface Vessel (LUSV) development is supported by research and development prototype vessels (Overlord prototype vessels already purchased) intended to demonstrate successful integration of government furnished Command, Control, Communications, Computers and Intelligence (C4I), combat systems, and the reliability of automated hull, mechanical, and electrical (HM&E) systems. The program leverages years of investment and full scale demonstration efforts in autonomy, endurance, command and control, payloads and testing from the Defense Advanced research Projects Agency (DARPA) Anti-Submarine Warfare Continuous Trail Unmanned Vessel (ACTUV), Office of Naval Research (ONR) Medium Displacement Unmanned Surface Vehicle (MDUSV)/Sea Hunter (FY 2017 to

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0603178N I (U)LARGE UNMANNED SURFACE VESSELS (LUSVs)				
FY 2021), and Office of the Secretary of Defense Strategic Capabilities Office (OSD- SCO) Ghost Fleet Overlord Large USV experimentation effort (FY 2018 - FY 2021). The combination of fleet-ready C2 solutions developed by the Ghost Fleet Overlord program and man-in-the-loop or man-on-the-loop control will reduce the risk of fleet integration of unmanned surface vehicles and allow autonomy and payload technologies to develop in parallel with fielding vehicles with standardized interfaces.						
LUSV is the baseline vessel defined in the Offensive Surface Fires Analysis of Alternatives (OSF AoA). The OSF AoA examined a wide range of material solutions to determine the most appropriate vessel to deliver additional capacity to the fleet.						
B. Program Change Summary (\$ in Millions)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget		102.493	146.840	125.501	-	125.501
Current President's Budget		98.871	136.580	117.400	-	117.400
Total Adjustments		-3.622	-10.260	-8.101	-	-8.101
• Congressional General Reductions		-	-0.260			
• Congressional Directed Reductions		-	-10.000			
• Congressional Rescissions		-	-			
• Congressional Adds		-	-			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-3.622	0.000			
• Rate/Misc Adjustments		0.000	0.000	-8.101	-	-8.101
Change Summary Explanation						
Program Changes:						
Technical: Not applicable						
Schedule: Not applicable						
Cost:						
FY 2022: -\$3.622M SBIR/STTR/FTT Assessment (SBIR)						
FY 2023: -\$10.260M Congressional -\$10.000M and -\$0.260 Miscellaneous adjustment						
FY 2024: -\$8.101M Miscellaneous adjustment						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603178N / (U)LARGE UNMANNED SURFACE VESSELS (LUSVs)				Project (Number/Name) 3066 / Large Unmanned Surface Vessel (LUSV)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3066: Large Unmanned Surface Vessel (LUSV)	67.517	98.871	136.580	117.400	-	117.400	127.855	127.006	129.431	131.729	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Large Unmanned Surface Vessel (LUSV) (Project 3066) was a new start in FY 2020. FY 2020 funding in Program Element (PE) 0603502N. Project 3066 realigned from PE 0603502N starting in FY 2021. The Navy has rebalanced the FY 2022 RDTE profile, shifting C4I non-recurring engineering and autonomy development funding that can be applied to both the LUSV and MUSV programs into the USV Enabling Capabilities Project 3067 (Program Element 0605513N). For FY23, the Navy realigned funding for development of the Unmanned Surface Vessel Integrated Combat System Development (USV ICS) to PE 0605513N, reflecting the Navy's vision of eventually fielding the USV ICS across all unmanned surface platforms. Hardware and platform-specific USV ICS requirements for LUSV and Overlord prototype vessels remain in LUSV PE 0603178N.

A. Mission Description and Budget Item Justification

The major goal for FY 2024 is maintaining the planned Detail Design and Construction (DD&C) for the initial production LUSV in FY 2025. The Navy instituted a comprehensive system engineering framework and supporting land and sea based prototyping plan, which will be completed prior to commencing the formal program of record and LUSV production. In support of this, the Navy has developed a holistic USV work breakdown structure (WBS) framework to help coordinate developmental and systems engineering efforts applicable across the USV portfolio and efforts that are platform-specific. The WBS categories are divided into broad key enablers, including HM&E (1.0), C4I (2.0), USV ICS (3.0), Common Control System (CCS) (4.0), autonomy (5.0), and prototyping efforts (6.0).

The supporting land and sea based prototyping plan will use the four Overlord Prototype vessels (vessels procured in FY20 will be delivered in FY22 and FY23) and various land based testing facilities to mature enabling technologies and qualify representative machinery. In support of the updated developmental and prototyping plan, the Navy is aligning Detail Design and Construction for the initial production LUSVs with the risk reduction and qualification plans described in the program System Engineering Framework (Work Breakdown Structure (WBS)). In addition, the outcome of the Offensive Surface Fires Analysis of Alternatives (OSF AoA) is supporting the refinement of program requirements leading to the validation of a Capability Development Document, acquisition strategy, and timing for procurement. The Navy's new plan does not include procurement of any additional prototype vessels.

The LUSV will be capable of weeks-long deployments and trans-oceanic transits and operate aggregated with Carrier Strike Groups (CSGs), Amphibious Ready Groups (ARGs), Surface Action Groups (SAGs), and individual manned combatants. The LUSV will be capable of autonomous navigation, transit planning, and COLREGS-compliant maneuvering and will be designed with automated propulsion, electrical generation, and support systems. LUSV missions will be conducted with operators in-the-loop (with continuous or near-continuous observation or control) or on-the-loop (autonomous operation that prompts operator action/intervention from sensory input or autonomous behaviors). LUSVs with integrated payload capability and prototypes employing non-organic payloads will not be capable of autonomous payload engagement or execution of a complete detect-to-engage sequence. The vessel will be incapable of payload activation, deactivation, or engagement without the deliberate action of a remote, off-hull human operator in the command and control loop. The program will integrate current Navy combat systems programs of record

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023				
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603178N / (U)LARGE UNMANNED SURFACE VESSELS (LUSVs)	Project (Number/Name) 3066 / Large Unmanned Surface Vessel (LUSV)				
that have been adapted to enable remote monitoring and operational control from an off-hull command and control point, and will not be equipped with components that would enable payload engagement from onboard the vessel. USV Command and Control (C2) will be maintained via an afloat element (i.e., embarked on a United States Navy (USN) combatant), or via the ashore element (C2 station ashore).						
The LUSV program is continuing to execute a comprehensive land and sea-based prototyping strategy to develop and deliver incremental capability increases, demonstrate key autonomy and automation enablers, and improve reliability of representative machinery. The Overlord research and development prototype vessels support this strategy by demonstrating successful integration of government furnished Command, Control, Communications, Computers and Intelligence (C4I) (WBS 2.0), combat systems (WBS 3.0), and the reliability of automated hull, mechanical, and electrical (HM&E) systems (WBS 1.0), eventually leading to a LUSV with the Unmanned Surface Vessel Integrated Combat System (USV ICS) and organic payloads. Early prototype vessels are enabling the Navy to accrue operational hours to gather data on autonomy, automation, and systems reliability, increase confidence in the man-machine team, and develop and refine unmanned concepts of operation (CONOPs) and tactics, techniques, and procedures (TTPs). The overarching LUSV development strategy views the purchase, fielding, and testing of the prototype USVs through the procurement of production USVs as a single developmental effort.						
The LUSV Performance Specification that will be released under the Detail Design and Construction (DD&C) solicitation will heavily leverage the results of the prototype USV developmental effort, land based testing plan, LUSV industry design studies, and continued engagement with industry. The government-furnished C4I suite, and the USV ICS hardware and software that will be incorporated into the LUSV will be developed under the Unmanned Surface Vehicle Enabling Capabilities (PE 0605513N) (WBS 2.0 and 3.0). Non-organic payloads (e.g. CTEM) are being developed separately under other prototyping efforts and will be further developed and/or integrated into LUSV under the Enabling Capabilities project. Key combat systems, payload technologies, and enablers will continue to be developed and matured, leading to at-sea demonstrations, including a remotely commanded demonstration in FY 2024.						
The Navy is also executing a comprehensive reliability plan with the intent to discover and implement reliability enhancements into USV machinery plants (WBS 1.0) as well as provide a means to qualify LUSV-representative machinery plants prior to award of the initial production LUSVs. The effort leveraged industry engagement initially started under the LUSV Studies Contract effort, assisting the Navy to determine reliability enhancements, improvements, and other potential machinery plant architectures designed to achieve LUSV operational and reliability requirements. Additionally, the Navy is executing a parallel effort to qualify the main engines for the prototype MUSV (same as on 3 of 4 Overlord prototype USVs), which concludes in FY 2023.						
The Navy is continuing to test ancillary equipment and develop solutions for government-furnished engineering operations autonomy modules and machinery control systems at the Land Based Test Site at Naval Surface Warfare Center, Philadelphia.						
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Product Development		83.271	118.561	99.050	0.000	99.050
Articles:		-	-	-	-	-
FY 2023 Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023					
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603178N / (U)LARGE UNMANNED SURFACE VESSELS (LUSVs)		Project (Number/Name) 3066 / Large Unmanned Surface Vessel (LUSV)				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)				FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Continue machinery plant (main machinery and electrical distribution) qualification and reliability improvement plans, building on the efforts started under the LUSV Studies Contract. Continue site preparation and initial buildout of a LUSV shaft line, electrical distribution system, and expanded software and machinery control system lab at the Land Based Test Site as Naval Surface Warfare Center, Philadelphia (WBS 1.0). Reliability efforts in FY 2023 will be incorporated into the Performance Specification and captured in the DD&C RFP solicitation and associated artifacts (WBS 1.0). Purchase prototype USV ICS hardware for testing and demonstration from prototype USVs (WBS 3.0). Purchase USV ICS Command and Control (C2) Payloads for prototyping use on both manned and unmanned fleet assets (WBS6.0). Execute test and experimentation plans, led and executed by Commander, Surface Development Squadron ONE, for the prototype USVs in the inventory to continue to develop concepts of operation and unmanned/autonomous tactics, techniques, and procedures (WBS 6.0). Provide for the sustainment and maintenance of the prototype USVs in the inventory. Refine program requirements from the output of the OSF AoA leading to validation of a Capability Development Document.</p> <p>FY 2024 Base Plans: Continue machinery plant (main machinery and electrical distribution) qualification and reliability improvement plans, building on the efforts started under the LUSV Studies Contract. Continue site preparation and initial buildout of a LUSV electrical distribution system, and expanded software and machinery control system lab at the Land Based Test Site as Naval Surface Warfare Center, Philadelphia (WBS 1.0). Results from design maturation and trade studies will be incorporated into the Performance Specification and captured in the DD&C RFP Solicitation and associated artifacts (WBS 1.0). Complete Gate 4 SDS approval and Gate 4 RFP approval while preparing for Milestone B.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease in funding is supported by the completion of Overlord USV construction as well as USV ICS hardware procurement completing for the Overlord USVs.</p>								
<p>Title: Support</p> <p>Articles:</p> <p>FY 2023 Plans: Continue support to technology development and maturation efforts (across all WBS categories) and the continued refinement of requirements and acquisition documentation including a Capability Development Document, SEP, TEMP, LCSP, Cybersecurity Strategy, Open Systems Architecture Management Plan, Quality</p>				13.427 -	15.809 -	16.100 -	0.000 -	16.100 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603178N / (U)LARGE UNMANNED SURFACE VESSELS (LUSVs)		Project (Number/Name) 3066 / Large Unmanned Surface Vessel (LUSV)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Assurance Program Plan, Reliability and Maintainability Program Plan, Configuration Management Plan, Software Development Plan, NTSP and PPP, and all other artifacts leading up to a planned Milestone review prior to the planned DD&C award for the first production LUSV. Support all land and sea based prototyping and testing (WBS 6.0), program reliability improvement efforts, collaborating with industry and government partners to gather existing reliability data on LUSV-representative machinery plants, and develop and execute plans for qualification testing (WBS 1.0). Support demonstration of the Integrated Combat System from a surface combatant in FY 2023 (WBS 1.0 and 6.0)</p> <p>FY 2024 Base Plans: Continue support to technology development and maturation efforts (across all WBS categories) and the continued refinement of requirements and acquisition documentation including a SEP, TEMP, LCSP, Cybersecurity Strategy, Open Systems Architecture Management Plan, Quality Assurance Program Plan, Reliability and Maintainability Program Plan, Configuration Management Plan, Software Development Plan, NTSP and PPP, and all other artifacts leading up to a planned Milestone review prior to the planned DD&C award for the first production LUSV. Support all land and sea based prototyping and testing (WBS 6.0), program reliability improvement efforts, collaborating with industry and government partners to gather existing reliability data on LUSV-representative machinery plants, and develop and execute plans for qualification testing (WBS 1.0). Support demonstration of the Integrated Combat System from a surface combatant in FY2024 (WBS 1.0 and 6.0).</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: No significant increase.</p>						
<p>Title: Management Services</p> <p>Articles:</p> <p>FY 2023 Plans: Continue efforts carrying over from FY 2022, developing governing LUSV program acquisition and requirements documentation and supporting program developmental plans. Provide management support and oversight for the 4 Overload prototype USVs.</p> <p>FY 2024 Base Plans:</p>		2.173 -	2.210 -	2.250 -	0.000 -	2.250 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy									Date: March 2023		
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603178N / (U)LARGE UNMANNED SURFACE VESSELS (LUSVs)				Project (Number/Name) 3066 / Large Unmanned Surface Vessel (LUSV)			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)							FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Continue efforts carrying over from FY 2023, developing governing LUSV program acquisition and requirements documentation and supporting program developmental plans. Provide management support and oversight for the 4 Overlord prototype USVs. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: No significant increase.											
Accomplishments/Planned Programs Subtotals							98.871	136.580	117.400	0.000	117.400
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTEN/0605512N/3428: Medium Unmanned Surface Vehicle (MUSV)	57.872	85.966	85.800	-	85.800	99.387	98.268	99.761	101.768	Continuing	Continuing
• RDTEN/0605513N/3067: Unmanned Surface Vehicle Enabling Capabilities	115.436	181.534	176.261	-	176.261	293.493	213.290	190.510	195.165	Continuing	Continuing
• SCN/5119: Large Unmanned Surface Vessel	0.000	0.000	0.000	-	0.000	315.000	522.532	722.710	737.164	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
In FY 2020, the Navy purchased two Overlord prototype USVs as a means to mitigate technical risk and continue to generate lessons learned through testing and experimentation, as well as to further refine CONOPs and TTPs to include manned/unmanned teaming. In FY 2020, the Navy also awarded multiple LUSV Studies Contracts for a LUSV with reservations in the design to integrate future payloads, which will inform the final Performance Specification. Additionally, in FY 2020, the Navy implemented a comprehensive reliability improvement program, which will allow continuous engagement with industry to improve reliability of representative machinery plants (main engines, generators, and ancillary equipment) as well as provide a path to qualify the MUSV (and prototype USV) main engine and representative LUSV engines and generators. This effort will continue throughout the FYDP with the goal to qualify machinery plants for incorporation into the LUSV design as well as provide a set of standards for offerors to use to prove reliability. In parallel, the Navy has established a Land Based Test Site at Naval Surface Warfare Center, Philadelphia, which will serve to test ancillary equipment as well as develop and prove government furnished engineering autonomy software and machinery											

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603178N / (U)LARGE UNMANNED SURFACE VESSELS (LUSVs)	Project (Number/Name) 3066 / Large Unmanned Surface Vessel (LUSV)

control systems. In PB24, the Navy delayed procurement of initial production LUSVs to FY 2025 to align with risk reduction and qualification plans as described in the program System Engineering Framework (Work Breakdown Structure (WBS)).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603178N / (U)LARGE UNMANNED SURFACE VESSELS (LUSVs)				Project (Number/Name) 3066 / Large Unmanned Surface Vessel (LUSV)					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prototype USV Experimentation, CONOPS Development, Reliability Demonstration, Capstone, Underway Payload & Capability Demonstrations	Various	Various : Various	30.484	41.571	Nov 2021	40.422	Nov 2022	37.280	Nov 2023	-		37.280	Continuing	Continuing	Continuing
Prototype USV Operations and Support, Crew, Fuel	Various	Various : Various	0.000	15.000	Nov 2021	22.520	Nov 2022	24.500	Nov 2023	-		24.500	Continuing	Continuing	Continuing
Prototype USV Integrated Combat System HW	TBD	TBD : TBD	0.000	0.000		21.740	Dec 2022	12.400	Nov 2023	-		12.400	0.000	34.140	-
LUSV Comprehensive Reliability Plan/Machinery Plant Qualification	Various	Various : Various	0.000	18.200	Nov 2021	17.545	Nov 2022	8.441	Nov 2023	-		8.441	Continuing	Continuing	Continuing
LUSV Studies Contracts Engineering and Reliability Studies	C/FFP	Various : Various	10.000	0.000		0.000		0.000		-		0.000	10.000	20.000	-
Prototype USV 3 & 4 post-delivery GFE Integration	Various	Various : Various	0.000	8.500	Nov 2021	11.300	Nov 2022	8.542	Nov 2023	-		8.542	Continuing	Continuing	Continuing
LUSV Requirements Development	Various	TBD : TBD	0.000	0.000		5.034	Nov 2022	7.887	Nov 2023	-		7.887	0.000	12.921	-
Subtotal			40.484	83.271		118.561		99.050		-		99.050	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SUPSHIP, WF Center Support	WR	Various : Various	24.898	13.427	Nov 2021	15.809	Nov 2022	16.100	Nov 2023	-		16.100	Continuing	Continuing	Continuing
Subtotal			24.898	13.427		15.809		16.100		-		16.100	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603178N / (U)LARGE UNMANNED SURFACE VESSELS (LUSVs)						Project (Number/Name) 3066 / Large Unmanned Surface Vessel (LUSV)			
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	WR	NAVSEA : Washington, DC	0.300	0.300	Nov 2021	0.300	Nov 2022	0.300	Nov 2023	-		0.300	Continuing	Continuing	Continuing
Management Services	WR	Various : Various	1.835	1.873	Nov 2021	1.910	Nov 2022	1.950	Nov 2023	-		1.950	Continuing	Continuing	Continuing
Subtotal			2.135	2.173		2.210		2.250		-		2.250	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			67.517	98.871		136.580		117.400		-		117.400	Continuing	Continuing	N/A
Remarks															

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R-1 Program Element (Number/Name)
PE 0603178N I (U)LARGE UNMANNED SURFACE VESSELS (LUSVs)

3066 / Large Unmanned Surface Vessel
(LUSV)

Proj 3066	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Prototype USV	Overlord Prototype Construction [Cont'd from FY20]																											
LUSV Studies Contract	P-Spec Refinement & Reliability																											
Industry Engagement																												
Industry-led (Machinery OEM) LUSV Machinery Plant Test and Qualification																												
Land Based Test Site (LBTS)/Land Based Engineering Site (LBES)																												
NSWC PD Site Development and WBS 1.0 Enabler Testing																												
Initial Conversion from LUSV LBTS to LBES at NSWC PD																												
Requirements Development																												
Capability Development Document (CDD)	Development				Validation																							
Detail Design & Construction (DD&C)									RFP ▲								MS B ▲											
													Source Selection				Award ▲											

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R-1 Program Element (Number/Name)
PE 0603178N / (U)LARGE UNMANNED SURFACE VESSELS (LUSVs)

Project (Number/Name)	3066 / <i>Large Unmanned Surface Vessel (LUSV)</i>
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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603178N / (U)LARGE UNMANNED SURFACE VESSELS (LUSVs)	Project (Number/Name) 3066 / Large Unmanned Surface Vessel (LUSV)	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3066				
Prototype USV: Overlord Prototype Construction (options on WHS contract) [Continued from FY20]	1	2022	4	2023
Prototype USV: Prototype Experimentation	1	2022	4	2028
LUSV Studies Contract: Performance Specification Refinement and Reliability Studies	1	2022	3	2022
Industry Enagement: Industry-led (Machinery OEM) LUSV Machinery Plant Test and Qualification:	1	2022	4	2024
Land Based Test Site (LBTS)/Land Based Engineering Site (LBES): NSWC PD Site Development and WBS 1.0 Enabler Testing: NSWC PD Site Development and WBS 1.0 Enabler Testing	2	2022	3	2027
Land Based Test Site (LBTS)/Land Based Engineering Site (LBES): Initial Conversion from LUSV LBTS to LBES at NSWC PD: Initial Conversion from LUSV LBTS to LBES at NSWC PD	2	2027	4	2028
Requirements Development: Capability Development Document (CDD): CDD Development	2	2022	2	2023
Requirements Development: Capability Development Document (CDD): CDD Validation	2	2023	1	2024
Detail Design & Construction (DD&C): Milestone B	3	2025	3	2025
Detail Design & Construction (DD&C): RFP	2	2024	2	2024
Detail Design & Construction (DD&C): Source Selection	3	2024	3	2025
Detail Design & Construction (DD&C): Award	4	2025	4	2025
Proj 3066 (continued)				
LUSV Platform Enabler Development: WBS 1.0 High Reliability HM&E: WBS 1.0 High Reliability HM&E	2	2022	4	2028

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603178N / (U)LARGE UNMANNED SURFACE VESSELS (LUSVs)	Project (Number/Name) 3066 / Large Unmanned Surface Vessel (LUSV)		
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
LUSV Platform Enabler Development: WBS 1.0 High Reliability HM&E: WBS 1.0 High Reliability HM&E: Qualification		2	2024	2	2025
LUSV Platform Enabler Development: WBS 2.0 Overmatch Capable C4I: WBS 2.0 Overmatch Capable C4I		1	2022	4	2027
LUSV Platform Enabler Development: WBS 2.0 Overmatch Capable C4I: WBS 2.0 Overmatch Capable C4I: Increment 1		4	2024	4	2024
LUSV Platform Enabler Development: WBS 3.0 Unmanned Surface Vessel Integrated Combat System: WBS 3.0 Unmanned Surface Vessel Integrated Combat System (USV ICS)		1	2022	4	2027
LUSV Platform Enabler Development: WBS 4.0 Common Control System: WBS 4.0 Common Control System		1	2022	4	2027
LUSV Platform Enabler Development: WBS 4.0 Common Control System: WBS 4.0 Common Control System: NBVC UOC		4	2022	4	2022
LUSV Platform Enabler Development: WBS 4.0 Common Control System: WBS 4.0 Common Control System: DDG UOC		1	2024	1	2025
LUSV Platform Enabler Development: WBS 5.0 Perception and Autonomy: WBS 5.0 Perception and Autonomy		1	2022	4	2028
LUSV Platform Enabler Development: WBS 6.0 Platform Prototyping: WBS 6.0 Platform Prototyping		1	2022	4	2028
LUSV Platform Enabler Development: WBS 6.0 Platform Prototyping: WBS 6.0 Platform Prototyping: Unescorted Ops Capable		3	2024	3	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	559.235	26.972	60.737	40.653	-	40.653	37.814	36.606	35.018	35.721	Continuing	Continuing
2341: METOC Data Acquisition	193.388	3.102	9.078	8.979	-	8.979	7.983	8.019	7.665	7.822	Continuing	Continuing
2342: METOC Data Assimilation and Mod	331.598	18.366	19.182	18.640	-	18.640	20.028	19.742	18.617	18.989	Continuing	Continuing
2344: Precise Time and Astrometry	16.508	2.157	7.091	8.689	-	8.689	5.660	4.627	4.452	4.540	Continuing	Continuing
2363: Remote Sensing Capability Development	2.829	0.314	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.143
3207: Fleet Synthetic Training	3.487	0.000	0.002	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.489
3404: Tactical Environmental Support	7.880	1.913	3.168	3.100	-	3.100	2.878	2.929	2.975	3.035	Continuing	Continuing
3405: Decision Support Products & Dissemination	3.545	1.120	1.216	1.245	-	1.245	1.265	1.289	1.309	1.335	Continuing	Continuing
9999: Congressional Adds	0.000	0.000	21.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	21.000

A. Mission Description and Budget Item Justification

Understanding and accurately predicting the maritime environment is a naval warfighting advantage. Effective meteorological and oceanographic modeling depends upon a network of advanced, reliable sensors below, on and above the world's oceans. Combined with state-of-the-art computational infrastructure, the Navy-Marine Corps Meteorological and Oceanographic (METOC) team delivers 24/7 observations, precise forecasts and operational recommendation to commanders. The Air Tactical Applications (AOTA) Program Element (PE) is aligned with the Navy's maritime strategy to enhance future METOC mission capabilities supporting naval warfighters worldwide. New state-of-the art government and commercial technologies are identified, transitioned, demonstrated and then integrated into Combat Systems and programs of record to provide capabilities that provide real-time and near-real-time operational effects of the physical environment on the performance of combat forces and their new and emerging platforms, sensors, systems and munitions. The AOTA program element focuses on sensing and characterizing and predicting the littoral and deep-strike battlespace in the context of regional conflicts and crisis response scenarios.

Projects in this PE transition state-of-the art sensing, assimilation, modeling and decision aid technologies from government and commercial sources. Unique project development efforts include atmospheric and oceanographic data assimilation techniques, forecast models, data base management systems and associated software for use in mainframe, desktop and laptop computers. Model data, products and services can be used by forward-deployed personnel or in a reach-back mode to optimize sensor placement and force allocation decisions. Global Geospatial Information and Services efforts within this program address the bathymetric needs of the Navy. Also developed are algorithms to process new satellite sensor data for integration into Navy and Marine Corps decision support systems and for display as part of the common operational and tactical pictures. In addition, the projects provide for demonstration and validation of specialized atmospheric and oceanographic

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0603207N I Air/Ocean Tactical Applications				
instrumentation and measurement techniques, new sensors, communications and interfaces. Included are new capabilities to assess, predict and enhance the performance of current and emerging undersea warfare and mine warfare weapons systems. AOTA capabilities are designed to support the latest versions of the Global Command and Control System and specific unit-level combat systems. This PE develops technological upgrades for the U.S. Naval Observatory's Master Clock system to meet requirements of Department of Defense communications, cryptographic, intelligence, geolocation, and targeting systems; develops near-real-time earth orientation predictions; develops very precise determination of positions of both faint and bright stars; and supports satellite tracking and space debris studies.						
Major emphasis areas include the Naval Integrated Tactical Environmental System Next Generation (NITES-Next) and the METOC Data Acquisition, the METOC Data Assimilation & Modeling, the Precise Timing and Astrometry, the Fleet Synthetic Training, the Tactical Environmental Support, Decision Support Products & Dissemination, the Earth System Prediction Capability projects, and the Remote Sensing Capability Development.						
Advanced Component Development and Prototypes (ACD&P) efforts necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment are funded in this PE. Most of the work in this PE can be classified between Technology Readiness Level (TRL) 6 (system/subsystem model or prototype demonstration in a relevant environment) and TRL 7 (system prototype demonstration in an operational environment).						
Due to the number of efforts in this PE, the programs described herein are representative of the work included in this PE.						
B. Program Change Summary (\$ in Millions)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget		27.849	39.737	38.433	-	38.433
Current President's Budget		26.972	60.737	40.653	-	40.653
Total Adjustments		-0.877	21.000	2.220	-	2.220
• Congressional General Reductions		-	-			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	21.000			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-0.001	0.000			
• SBIR/STTR Transfer		-0.876	0.000			
• Rate/Misc Adjustments		0.000	0.000	2.220	-	2.220
Congressional Add Details (\$ in Millions, and Includes General Reductions)						
Project: 9999: Congressional Adds						
Congressional Add: Infrared optimized telescope						
Congressional Add: Maritime unattended sensors						
Congressional Add Subtotals for Project: 9999						
		FY 2022	FY 2023			
		0.000	3.000			
		0.000	18.000			
		0.000	21.000			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023	
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications	
Congressional Add Details (\$ in Millions, and Includes General Reductions)		FY 2022	FY 2023
Congressional Add Totals for all Projects		0.000	21.000
Change Summary Explanation Funding: FY24 increase is primarily associated with the new U.S. Naval Observatory (USNO) Master Clock technologies. Technical: No significant change. Schedule: No significant change			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications				Project (Number/Name) 2341 / METOC Data Acquisition			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2341: METOC Data Acquisition	193.388	3.102	9.078	8.979	-	8.979	7.983	8.019	7.665	7.822	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The major work of the Meteorology and Oceanography (METOC) Data Acquisition Project is to provide future mission capabilities to warfighters allowing them to detect and monitor the conditions of the physical environment throughout the entire battlespace. The most promising new sensor technologies (including unmanned vehicles, tactical sensor exploitation, in-situ sensors) are transitioned from the government's and commercial industry's technology base. These new sensor technologies are demonstrated, validated and integrated into operational programs for warfighters. These new sensor capabilities provide timely and accurate METOC data to operational and tactical commanders. METOC data requirements have evolved with emphasis on naval warfare shifting to littoral and deep strike battlespace. The need to accurately characterize dynamic conditions are crucial in planning and executing warfare operations and effectively allocating force weapon and sensor systems. Routinely available data sources, such as climatology, oceanographic and meteorological numerical models are necessary but not sufficient to support the littoral and deep strike regions. Operational sensors are deployed great distances from the target area of interest. The challenge is to collect and disseminate METOC data in variable and dynamic littoral environmental conditions or in denied, remote or inaccessible areas over extended periods of time.

This project: 1) provides the means to rapidly and automatically acquire a broad array of METOC data using off-board and on-board sensors; 2) provides an on-scene assessment capability for the tactical commander; 3) provides the tactical commander with real-time METOC data and products for operational use; 4) demonstrates and validates the use of tactical workstations and desktop computers for processing and display of METOC data and products; 5) demonstrates and validates techniques which employ data compression, connectivity and interface technologies to obtain, store, process, distribute and display these METOC data and products; 6) develops new charting and bathymetric survey techniques necessary to reduce hazards to navigation and improve forecast accuracy.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Meteorological and Oceanographic (METOC) Data Acquisition	3.102	9.078	8.979	0.000	8.979
Articles:	-	-	-	-	-
Description: Efforts falling within the Meteorology and Oceanography (METOC) Collections Project provide future scientific and technological warfighting capabilities that detect and continuously monitor environmental (atmospheric, sea surface, oceanographic and seabed) conditions throughout the battlespace. The Navy's mission continues to require focus on blue-water operations, littoral and deep-strike (inland) battlespaces. Each of these operating areas (and the transitions between them) has its own dynamic and complex environmental characteristics and behaviors that require modifying METOC Collections and associated sensing strategies and methodologies. Without reliable characterization of ocean and atmosphere in these operating areas, the Navy risks ineffective allocation and employment of warfighters and weapon systems, and the sensors that					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023				
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications	Project (Number/Name) 2341 / METOC Data Acquisition				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
fully enable them. Fleet Naval METOC has updated the definition and structure of the METOC program along the lines of operational mission needs. This update focuses on the operational characteristics of Tasking, Collection, Processing, Exploitation, and Dissemination (TCPED) of METOC data and information. Identified efforts supporting METOC are realigned to projects and activities that align to the TCPED updated program structure.							
FY 2023 Plans: -Continue evaluation and integration of sea surface composition and structure by remote and inverted (or "through-the-sensor" means. Validate electro-optical, acoustic and synthetic aperture radar observations in an operational setting and as suitable for improved ocean model bathymetry. -Continue integration of acoustic oceanographic data and model components as components to tactical decision aids. -Continue to improve the Navy Coupled Ocean Data Assimilation-Forward (NCODAf) ocean observation collection and assimilation system, to include operationalizing the capability to ingest physical ocean observations other than traditional static vertical soundings. -Continue development, validation and operationalization of software that enables Navy numerical weather and ocean prediction models to ingest observations from new and emergent satellites, including commercial and partner nation instruments. -Continue to update and expand applications of refractivity from radio (RFR) projects, including extraction of atmospheric information from radar clutter. -Continue to develop, validate and integrate processes for inclusion of quantified atmospheric aerosol data into 1) calibration and correction algorithms for satellite retrieval of other environmental parameters, and into 2) tactical data aids supporting multiple weapons, sensors and decision systems. -Continue efforts in data compression and delivery. Specific efforts include evaluation and integration of single-value decomposition applications to forecast model output, application of automation-based compression							

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023				
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications	Project (Number/Name) 2341 / METOC Data Acquisition				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>techniques. Objective is to enable delivery of timely and relevant environmental information to communications-limited assets.</p> <p>FY 2024 Base Plans:</p> <ul style="list-style-type: none">- Continue evaluation and integration of sea surface composition and structure by remote and inverted (or "through-the- sensor" means. Validate electro-optical, acoustic and synthetic aperture radar observations in an operational settings and as suitable for improved ocean model conditions, from wave state through bathymetry.- Continue integration of acoustic oceanographic data and model components as to tactical decision aids.- Continue to improve the Navy Coupled Ocean Data Assimilation-Forward (NCODAf) ocean observation collection and assimilation system, to include operationalizing the capability to ingest physical ocean observations beyond traditional static vertical soundings.- Continue development, validation and operationalization of software that enables Navy numerical weather and ocean prediction models to ingest and quality control observations from new and emergent satellites, including commercial and partner nation instruments.- Continue to update and expand applications of refractivity from radio (RFR) projects, including extraction of atmospheric information from radar clutter.- Continue to develop, validate and integrate processes for inclusion of quantified atmospheric aerosol data into 1) calibration and correction algorithms for satellite retrieval of other environmental parameters, and into 2) tactical data aids supporting multiple weapons, sensors and decision systems.- Continue efforts in data compression and delivery. Specific efforts include evaluation and integration of single-value decomposition applications to forecast model output, application of automation-based compression techniques. Objective is to enable delivery of timely and relevant environmental information to communications-limited assets.- Initiate validation and maturation of Ionospheric data collection and application programming interfaces important to forecasting the capabilities and limitations of long range communications.							

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603207N / <i>Air/Ocean Tactical Applications</i>		Project (Number/Name) 2341 / <i>METOC Data Acquisition</i>	

<u>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</u>	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Initiate advanced remote sensing retrievals of earth system characteristics, including using current and upcoming Satellite Based Environmental Monitoring (SBEM) frequencies available in optical, infrared and microwave spectral bands with a common processing software between sensors and applications.</p> <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> There is no significant funding change from FY 2023 to FY 2024.</p>					
Accomplishments/Planned Programs Subtotals	3.102	9.078	8.979	0.000	8.979

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
Acquisition, management and contracting strategies are to support the Meteorological and Oceanographic (METOC) Data Acquisition Project to develop, demonstrate, and validate METOC data collection methods and sensors, and to evolve the ability to provide timely and accurate METOC data and products to the Tactical Commander, all with management oversight by the Navy.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications				Project (Number/Name) 2341 / METOC Data Acquisition					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC (DATA) Collections	WR	NRL : Washington, DC	84.878	0.300	Nov 2021	0.800	Nov 2022	0.830	Nov 2023	-		0.830	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	WR	SSC PAC : California	23.363	0.200	Nov 2021	0.300	Nov 2022	0.200	Nov 2023	-		0.200	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	Various	Various : Various	45.516	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare (TOC USW)	Various	Various : Various	5.764	0.000		0.500	Nov 2022	0.510	Nov 2023	-		0.510	Continuing	Continuing	Continuing
Littoral Battlespace Sensing - Autonomous Undersea Vehicle	Various	Various : Various	8.422	0.000		0.500	Nov 2022	0.500	Nov 2023	-		0.500	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare (TOC USW)	WR	NSWC : Bethesda, MD	1.193	0.000		0.500	Nov 2022	0.500	Nov 2023	-		0.500	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	C/FP	APPLIED SCIENCE ASSOCIATED : RHODE ISLAND	0.466	0.000		0.450	Nov 2022	0.436	Nov 2023	-		0.436	Continuing	Continuing	Continuing
METOC (DATA) Collections	C/FP	University of Washington : Seattle, WA	0.943	0.250	Oct 2021	0.400	Oct 2022	0.400	Oct 2023	-		0.400	Continuing	Continuing	Continuing
METOC (DATA) Collections	C/FP	METRON : Reston, VA	1.124	0.400	Oct 2021	0.500	Oct 2022	0.200	Oct 2023	-		0.200	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	C/FP	SAIC : Virginia	1.781	0.000		0.000		0.200	Oct 2023	-		0.200	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	C/FP	CSC : Virginia	1.831	0.000		0.000		0.200	Oct 2023	-		0.200	Continuing	Continuing	Continuing
METOC (DATA) Collections	WR	NRL : Monterey,CA Stennis Space Center, MS	4.312	0.721	Oct 2021	2.156	Oct 2022	2.200	Oct 2023	-		2.200	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	C/CPFF	GDIT : Virginia	0.138	0.000		0.400	Oct 2022	0.200	Oct 2023	-		0.200	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications				Project (Number/Name) 2341 / METOC Data Acquisitions					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC (DATA) Collections	C/FP	Penn State University : PA	4.204	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			183.935	1.871		6.506		6.376		-		6.376	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	C/CPIF	Various : Various	6.537	0.481	Nov 2021	1.222	Nov 2022	1.230	Nov 2023	-		1.230	0.000	9.470	-
Littoral Battlespace Sensing - Autonomous Undersea Vehicle	C/FP	SAIC : Virginia	0.600	0.000		0.000		0.000		-		0.000	0.000	0.600	-
Tactical Oceanography Capabilities / Undersea Warfare (TOC USW)	WR	SSC PAC : California	0.247	0.000		0.000		0.000		-		0.000	0.000	0.247	-
METOC Future Mission Capabilities	C/CPFF	PSS/BAH : California	0.066	0.000		0.000		0.000		-		0.000	0.000	0.066	-
Subtotal			7.450	0.481		1.222		1.230		-		1.230	0.000	10.383	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	Various	Various : Various	0.860	0.750	Nov 2021	0.700	Nov 2022	0.723	Nov 2023	-		0.723	0.000	3.033	-
Subtotal			0.860	0.750		0.700		0.723		-		0.723	0.000	3.033	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications				Project (Number/Name) 2341 / METOC Data Acquisitions					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	Various	Not Specified : Not Specified	0.243	0.000		0.150	Oct 2022	0.150	Oct 2023	-		0.150	0.000	0.543	-
METOC Future Mission Capabilities Management Support	C/FP	BAH : Virginia	0.900	0.000		0.500	Oct 2022	0.500	Nov 2023	-		0.500	0.000	1.900	-
Subtotal			1.143	0.000		0.650		0.650		-		0.650	0.000	2.443	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			193.388	3.102		9.078		8.979		-		8.979	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																Date: March 2023																	
Appropriation/Budget Activity 1319 / 4												R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications								Project (Number/Name) 2341 / METOC Data Acquisition													
METOC Collections - global and theater scales	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028								
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q					
Oceanographic and Ocean Acoustics Database Development																																	
	Deep Ocean Bottom Backscattering Database																																
	Deep Ocean Bottom Backscattering Database																																
Satellite-based environmental monitoring for, analysis, assimilation and modeling																																	
	Atmospheric Data Assimilation																																
	DoD MW Sensors Special Sensor Microwave Imager Sounder (SSMIS),																																
	Operational Satellite Sea Ice Products																																
	Satellite Optical Data for Coupled Ocean-Atmosphere Models																																
	Extended Forecasts using Satellite Observations -- NRL-MRY																																

2024DON - 0603207N - 2341

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy														Date: March 2023																											
Appropriation/Budget Activity 1319 / 4														R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications								Project (Number/Name) 2341 / METOC Data Acquisition																			
METOC Collections - targeted and tactical scales	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028																
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q													
Emerging Air-Ocean Sensor Technology Test and Evaluation																																									
	ESTTE - LBS-G AN (Ambient Noise) -- SSC-PAC																																								
	ESTTE - SHARC RFR -- Various																																								
Forward-based ocean and ocean acoustics modeling and data assimilation																																									
	NCODA-Forward Collaborative Integration																																								
	NCODA-Forward Collaborative Integration -- NRL-DC																																								
	NCODA-Forward Collaborative Integration -- NSWCCD / METRON																																								
	RTP: An NCODA-based Capability for Forward Ocean Data Assimilation																																								
Through-the-sensor environmental data collections																																									
	P-8 Environmental Data Sensing																																								
2024DON - 0603207N - 2341																																									

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603207N / Air/Ocean Tactical Applications

Project (Number/Name)

2341 / METOC Data Acquisition

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
METOC Collections - global and theater scales				
Oceanographic and Ocean Acoustics Database Development: Deep Ocean Bottom Backscattering Database -- ARL-PSU	1	2022	4	2026
Oceanographic and Ocean Acoustics Database Development: Deep Ocean Bottom Backscattering Database -- NPS	1	2022	4	2026
Oceanographic and Ocean Acoustics Database Development: "Use of Mobile Acoustic Source for In-situ Transmission	1	2022	4	2026
Satellite-based environmental monitoring for, analysis, assimilation and modeling: Atmospheric Data Assimilation -- NRL-MRY	1	2022	4	2025
Satellite-based environmental monitoring for, analysis, assimilation and modeling: "DoD MW Sensors Special Sensor Microwave Imager Sounder (SSMIS),	1	2022	4	2026
Satellite-based environmental monitoring for, analysis, assimilation and modeling: Operational Satellite Sea Ice Products -- NRL-DC	1	2022	4	2025
Satellite-based environmental monitoring for, analysis, assimilation and modeling: Satellite Optical Data for Coupled Ocean-Atmosphere Models -- NRL-SSC	1	2022	4	2026
Satellite-based environmental monitoring for, analysis, assimilation and modeling: RTP: Flux Correction for Coupled System Extended Forecasts using Satellite Observations -- NRL-MRY	1	2022	4	2026
METOC Collections - targeted and tactical scales				
Emerging Air-Ocean Sensor Technology Test and Evaluation: ESTTE - LBS-G AN (Ambient Noise) -- SSC-PAC	1	2022	4	2026
Emerging Air-Ocean Sensor Technology Test and Evaluation: ESTTE - SHARC RFR -- Various	1	2022	4	2025
Forward-based ocean and ocean acoustics modeling and data assimilation: NCODA-Forward Collaborative Integration -- METRON Scientific Solutions, Inc.	1	2022	4	2025

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications	Project (Number/Name) 2341 / METOC Data Acquisition		
	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
Forward-based ocean and ocean acoustics modeling and data assimilation: NCODA-Forward Collaborative Integration -- NRL-DC	1	2022	4	2025
Forward-based ocean and ocean acoustics modeling and data assimilation: NCODA-Forward Collaborative Integration -- NSWCCD / METRON	1	2022	4	2027
Forward-based ocean and ocean acoustics modeling and data assimilation: RTP: An NCODA-based Capability for Forward Ocean Data Assimilation -- NRL-SSC	1	2022	4	2027
Through-the-sensor environmental data collections: P-8 Environmental Data Sensing -- SSC-LANT	1	2022	4	2026

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications				Project (Number/Name) 2342 / METOC Data Assimilation and Mod			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2342: METOC Data Assimilation and Mod	331.598	18.366	19.182	18.640	-	18.640	20.028	19.742	18.617	18.989	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Battlespace Data Assimilation and Prediction Project (2342) enables the future warfighter to leverage observed environmental data gathered under Project 2341 (METOC Data Acquisition) by assimilating data into and fusing them with sophisticated high-resolution (spatial and temporal) assessment and prediction models made possible by high-performance computing. These models gain increasing importance as weapons and sensors grow in sophistication and complexity, making them all the more sensitive to the effects of the natural environment. Meteorology and Oceanography (METOC) Processing enables full understanding of the limitations and constraints imposed by ocean and atmosphere, in space and time, thus quantifying and minimizing their impact on weapons, sensors, and mission. However, METOC Processing itself is limited by the temporal and spatial resolutions at which data are collected and numerically analyzed and predicted. Thus Projects 2341 and 2342 must remain aggressive in delivering higher and higher resolutions, demanding greater and greater computational and database capacities. METOC Processing efforts must also rise to the challenge of assimilating smaller-scale phenomena, particularly in the littorals, and predicting their spatial and temporal effects, as stated by Fleet and Force Commanders who require remote autonomous, clandestine, littoral battlespace sensing in near-shore areas to enable Sea Shield & Sea Basing. This next step in the Information Warfare (IW) Tasking, Collection, Processing, Exploitation and Dissemination (TCPED) continuum, METOC Processing, is critical to fully characterize the physical battlespace environment in real-time and in predictive/forecasting modes, and gives the warfighter a decisive advantage in the complex blue-water, littoral and deep-strike battlespaces.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Battlespace Data Assimilation and Prediction	18.366	19.182	18.640	0.000	18.640
Articles:	-	-	-	-	-
Description: The Battlespace Data Assimilation and Prediction Project (2342) enables the future warfighter to leverage observed environmental data gathered under Project 2341 (METOC Collections) by assimilating data into and fusing them with sophisticated high-resolution (spatial and temporal) assessment and prediction models made possible by high-performance computing. These models gain increasing importance as weapons and sensors grow in sophistication and complexity, making them all the more sensitive to the effects of the natural environment. METOC Processing enables full understanding of the limitations and constraints imposed by ocean and atmosphere, in space and time, thus quantifying and minimizing their impact on weapons, sensors and mission. However, METOC Processing itself is limited by the temporal and spatial resolutions at which data are collected and numerically analyzed and predicted. Thus Projects 2341 and 2342 must remain aggressive in delivering higher and higher resolutions, demanding greater and greater computational and database capacities.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603207N / <i>Air/Ocean Tactical Applications</i>	Project (Number/Name) 2342 / <i>METOC Data Assimilation and Mod</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2022	FY 2023	FY 2024 Base
<p>METOC Processing efforts must also rise to the challenge of assimilating smaller-scale phenomena, particularly in the littorals, and predicting their spatial and temporal effects, as stated by Fleet and Force Commanders who require remote autonomous, clandestine, littoral battlespace sensing in near-shore areas to enable Sea Shield & Sea Basing. This next step in the TCPED continuum, METOC Processing, is critical to fully characterize the physical battlespace environment in real-time and in predictive/ forecasting modes, and gives the warfighter a decisive advantage in the complex blue-water, littoral and deep-strike battlespaces.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none"> -Continue improvements for the operational global forecast model, NAVGEM, with components (including ensemble development) that will inform development of the next generation atmospheric model NEPTUNE. Develop and aerosol global forecasting capability that will integrate into NEPTUNE, and develop NEPTUNE to operational readiness. -Continue development of the Earth Systems Prediction Capability (ESPC) ensemble global prediction mode via upgrades to physics subroutines and incorporation of high-altitude capabilities in the ESPC atmosphere model, NAVGEM. Additionally, continue development, validation and operationalization of ESPC deterministic version 2.0. -Continue development of the Navy Ionosphere Model for Operations (NIMO) towards a 24 hors forecast of atmospheric electron density, which will inform predictions for sensors, communications, and weapons performance. -Continue improvements to the regional coupled ocean-atmospheric model COAMPS to enhance ocean surface, sea ice and near shore accuracy. Improve capabilities in soil moisture and flux representation to facilitate boundary layer and convective skill upgrades. -Continue and expand intermodal data assimilation efforts to merge code bases and algorithm development across ocean and atmospheric applications, to gain efficiencies in development and implementation. -Continue the design and implementation of seafloor acoustic, and ambient noise databases that include vertical and temporal dependencies, with the objective of providing higher resolution data to USW tactical decision aids. 					
					FY 2024 OCO
					FY 2024 Total

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications		Project (Number/Name) 2342 / METOC Data Assimilation and Mod		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>-Continue to improve, validate and implement ocean acoustic prediction models, analysis tools and critical environmental parameter databases in preparation for future increments of shipboard tactical combat system software and capability updates.</p> <p>-Initiate improvements to the Global Ocean Forecast System to include a higher order advective scheme and an expanded data assimilation capability via improvements to the NCODA data assimilation system.</p> <p>-Continue improvements to autonomous-platform control software, including integration with ocean circulation models and platform-specific interfaces.</p> <p>-Continue to integrate specific capability upgrades to regional models. Projects will include using tropical cyclone structure as an indicator of development potential, with the objective of increasingly accurate forecasts of rapid intensification of tropical storms.</p> <p>-Continue improvements to ocean data assimilation systems for global models (NCODA 3DVAR) and regional models. (NCODA 4DVAR), with the objective of using more of the globally available data.</p> <p>-Continue to increase predictive capabilities of tactical acoustic models. Specific projects include upgrades to Navy Standard Parabolic Equation model in sound channel propagation and surface duct loss, and integration of uncertainty and confidence measures.</p> <p>FY 2024 Base Plans:</p> <p>- Conclude improvements for the deterministic operational global forecast model, NAVGEM, with components that will inform development of the next generation atmospheric model NEPTUNE.</p> <p>- Conclude improvements to autonomous-platform control software, including integration with ocean circulation models and platform-specific interfaces.</p> <p>- Continue improvements for the ensemble version of the operational global forecast model, NAVGEM, with components that will inform ensemble development of the next generation atmospheric model NEPTUNE.</p>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications		Project (Number/Name) 2342 / METOC Data Assimilation and Models		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Continue development of the Earth Systems Prediction Capability (ESPC) ensemble global prediction mode via upgrades to physics subroutines and incorporation of high-altitude capabilities in the ESPC atmosphere model, NAVGEM.						
- Continue development of the Navy Ionosphere Model for Operations (NIMO) towards a 24 hr forecast of atmospheric electron density, which will inform predictions for sensors, communications, and weapons performance.						
- Continue improvements to the regional coupled ocean-atmospheric model COAMPS to enhance ocean surface, sea ice and near shore accuracy. Improve capabilities in soil moisture and flux representation to facilitate boundary layer and convective skill upgrades.						
- Continue and expand intermodal data assimilation efforts to merge code bases and algorithm development across ocean and atmospheric applications, to gain efficiencies in development and implementation.						
- Continue the design and implementation of seafloor acoustic, and ambient noise databases that include vertical and temporal dependencies, with the objective of providing higher resolution data to USW tactical decision aids.						
- Continue to improve, validate and implement ocean acoustic prediction models, analysis tools and critical environmental parameter databases in preparation for future increments of shipboard tactical combat system software and capability updates.						
- Continue enhancements to the Global Ocean Forecast System to include a higher order advective scheme and an expanded data assimilation capability via improvements to the NCODA data assimilation system.						
- Continue to integrate specific capability upgrades to regional modeling systems. Projects will include using improved tropical cyclone indicators for rapid intensification forecasts and probabilistic storm surge capabilities.						
- Continue improvements to ocean data assimilation systems for global models (NCODA 3DVAR) and regional models. (NCODA 4DVAR), with the objective of using more of the globally available data.						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603207N / <i>Air/Ocean Tactical Applications</i>		Project (Number/Name) 2342 / <i>METOC Data Assimilation and Modeling</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Continue to increase predictive capabilities of tactical acoustic models. Specific projects include upgrades to Navy Standard Parabolic Equation model in sound channel propagation and surface duct loss, and integration of uncertainty and confidence measures.</p> <p>- Initiate development of a unified aerosol global forecasting capability (deterministic, ensemble and retrospective) that will integrate into the NEPTUNE processing suite.,</p> <p>- Initiate improved coupled ocean-atmosphere modeling and validation strategies, including development of a common verification system between ocean and atmosphere modeling suites and targeted coupled modeling development and analysis focus areas (such as the Arctic.)</p> <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> There is no significant funding change from FY 2023 to FY 2024.</p>						
Accomplishments/Planned Programs Subtotals		18.366	19.182	18.640	0.000	18.640
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
Acquisition, management and contracting strategies are to support the Meteorological and Oceanographic (METOC) Data Assimilation and Modeling Project to develop, demonstrate, and validate METOC data assimilation and environmental prediction capabilities, enabling timely and accurate delivery of METOC prediction data and products to the Tactical Commander, all with management oversight by the Navy.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications				Project (Number/Name) 2342 / METOC Data Assimilation and Mod					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	WR	NRL : Washington DC	135.981	2.550	Nov 2021	2.295	Nov 2022	2.295	Nov 2023	-		2.295	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	Various	Various : Various	46.068	0.450	Oct 2021	1.117	Oct 2022	1.117	Oct 2023	-		1.117	0.000	48.752	-
METOC Space-Based Sensing Capabilities	WR	NRL : Washington, DC	17.092	0.650	Oct 2021	0.585	Oct 2022	0.585	Oct 2023	-		0.585	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare	WR	NRL : Washington, DC	9.480	0.400	Oct 2021	0.360	Oct 2022	0.360	Oct 2023	-		0.360	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	University of Texas : TX	1.663	0.400	Oct 2021	0.360	Oct 2022	0.360	Oct 2023	-		0.360	0.000	2.783	-
Tactical Oceanography Capabilities / Undersea Warfare	WR	NSWC Carderock : West Bethesda, MD	2.590	0.350	Oct 2021	0.315	Oct 2022	0.315	Oct 2023	-		0.315	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare	WR	NAVOCEANO : Mississippi	1.049	0.000		0.000		0.000		-		0.000	0.000	1.049	-
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	University of Washington : Seattle, WA	0.850	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	Johns Hopkins University : MD	0.594	0.200	Nov 2021	0.180	Nov 2022	0.180	Nov 2023	-		0.180	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	SAIC/QNA : Various	1.876	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	C/FP	SAIC/QNA : Various	3.096	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	Penn Sate University : Pennsylvania	0.125	0.000		0.000		0.000		-		0.000	0.000	0.125	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603207N / Air/Ocean Tactical Applications

Project (Number/Name)

2342 / METOC Data Assimilation and Mod

Product Development (\$ in Millions)

				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Tactical Oceanography Capabilities / Undersea Warfare	WR	SSC LANT : North Charleston	0.050	0.000		0.000		0.000		-		0.000	0.000	0.050	-
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	SPA : Virginia	0.375	0.000		0.000		0.000		-		0.000	0.000	0.375	-
METOC SUPPORT SPACE-SOFTWARE DEVELOPMENT	WR	NRL : WASHINGTON DC	0.640	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	METRON : Virginia	0.685	0.000		0.000		0.000		-		0.000	0.000	0.685	-
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	Vencore : Virginia	0.239	0.000		0.000		0.000		-		0.000	0.000	0.239	-
METOC Battlespace Data Assimilation and Prediction	WR	NRL : Monterey, CAI Stennis Space Center,MS	25.483	4.550	Oct 2021	4.597	Oct 2022	4.370	Oct 2023	-		4.370	0.000	39.000	-
Earth Systems Prediction Capability (ONR)	WR	NRL : Washington DC	55.421	5.726	Oct 2021	5.670	Oct 2022	5.419	Oct 2023	-		5.419	Continuing	Continuing	Continuing
ESPC	Various	Various : Various	9.329	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CHIEF OF NAVAL OPERATIONS SPEED TO FLEET INITIATIVE	WR	NRL : WASHINGTON DC	0.850	0.000		0.000		0.000		-		0.000	1.130	1.980	-
Subtotal			313.536	15.276		15.479		15.001		-		15.001	Continuing	Continuing	N/A

Support (\$ in Millions)

				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	Various	Various : Various	0.795	0.000		0.000		0.000		-		0.000	0.000	0.795	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications				Project (Number/Name) 2342 / METOC Data Assimilation and Modeling					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Littoral Battlespace Sensing - Autonomous Undersea Vehicle	C/FP	SAIC : Virginia	0.473	0.000		0.000		0.000		-		0.000	0.000	0.473	-
Tactical Oceanography Capabilities / Undersea Warfare	C/FP	SAIC : Virginia	0.634	0.000		0.000		0.000		-		0.000	0.000	0.634	-
METOC Future Mission Capabilities	C/FP	SAIC : VIRGINIA	0.915	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
METOC SUPPORT SPACE-PROGRAM SUPPORT	WR	SSC PACIFIC : SAN DIEGO, CA	1.256	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Earth System Modeling Framework - Common Software Architecture	Various	Various : Boulder, CO; Various	2.435	1.100	Dec 2021	1.000	Dec 2022	1.000	Dec 2023	-		1.000	0.000	5.535	-
Program Support and Subject Matter Expertise	Various	UW-APL : Seattle, WA	2.984	0.300	Oct 2021	0.270	Oct 2022	0.205	Oct 2023	-		0.205	Continuing	Continuing	Continuing
Subtotal			9.492	1.400		1.270		1.205		-		1.205	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	TBD	Charles River : Boston, MA	1.457	0.000		0.000		0.000		-		0.000	0.000	1.457	-
Subtotal			1.457	0.000		0.000		0.000		-		0.000	0.000	1.457	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	Various	Various : Various	0.090	0.000		0.000		0.000		-		0.000	0.000	0.090	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications				Project (Number/Name) 2342 / METOC Data Assimilation and Mod					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Space-Based Sensing Capabilities	Various	Various : Various	1.500	0.990	Oct 2021	0.783	Oct 2022	0.784	Oct 2023	-		0.784	0.000	4.057	-
Tactical Oceanography Capabilities / Undersea Warfare	WR	SSC PAC : San Diego, CA	1.468	0.700	Oct 2021	1.650	Oct 2022	1.650	Oct 2023	-		1.650	Continuing	Continuing	Continuing
METOC Future Mission Capabilities	C/FP	PSS/BAH : San Diego, CA	0.216	0.000		0.000		0.000		-		0.000	0.000	0.216	-
METOC Space-Based Sensing Capabilities	C/FP	BAH : VIRGINIA	0.892	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
METOC Space-Based Sensing Capabilities	WR	SSC PAC : SAN DIEGO, CA	2.202	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
METOC Acquisition Management	C/CPFF	PSS/BAH : SAN DIEGO, CA	0.745	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			7.113	1.690		2.433		2.434		-		2.434	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			331.598	18.366		19.182		18.640		-		18.640	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

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1319 / 4

R-1 Program Element (Number/Name)	Program Element Description	Program Element Type	Program Element Status	Program Element Location	Program Element Date	Program Element Time	Program Element Duration	Program Element Frequency	Program Element Priority	Program Element Impact	Program Element Notes
1	1.1	1.1.1	1.1.1.1	1.1.1.1.1	1.1.1.1.1.1	1.1.1.1.1.1.1	1.1.1.1.1.1.1.1	1.1.1.1.1.1.1.1.1	1.1.1.1.1.1.1.1.1.1	1.1.1.1.1.1.1.1.1.1.1	1.1.1.1.1.1.1.1.1.1.1.1

PE 0603207N / Air/Ocean Tactical Applicati
ons

Project (Number/Name)	Start Date	End Date	Duration (Days)	Actual Cost	Budgeted Cost	Variance	Cost Index	Performance Index	Cost Variance	Cost Performance	Cost Variance	Cost Performance
101	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
102	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
103	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
104	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
105	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
106	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
107	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
108	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
109	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
110	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
111	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
112	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
113	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
114	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
115	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
116	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
117	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
118	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
119	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
120	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
121	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
122	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
123	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
124	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
125	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
126	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
127	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
128	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
129	10/1/2010	10/1/2010	1	1000	1000	0	1.00	1.00	0	1.00	0	1.00
130	10/1/2010	10/1/2010	1	1000	1000	0						

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Proj 2342		FY 2022				FY 2023				FY 2024			
Page 1		1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
METOC Processing - global and theater scales		NAVGEM Upgrade for Improved Earth Orientation Parameters											
	Numerical prediction in support of Precise Time and Astrometry	Biological scattering and attenuation at tactical frequencies											
	Oceanographic and Ocean Acoustics Database Development	Boundary Interactions - TOTLOS Improvements											
		Cloud Enablement of Ocean and Atmospheric Master Library											
		OAML Models and Database Verification, Validation and Enhancement											
Satellite-based environmental monitoring for, analysis, assimilation and modeling		The Improved Synthetic Ocean Profiles (ISOP), Version 2											
		Advanced Satellite Data Assimilation											
		Aerosol observations for NAAPS validation											
		Mean sea surface height for Sentinel -3A/B x --											
		Modeling, Sensing and Forecasting Ocean Optical Products											
		NFLUX: Ocean Surface Bias Detection and Correction Using Satellites											
		Operationally implementing sat-derived ice products											
		Satellite Aerosol Data Assimilation											
		Space METOC: Sea Surface Temp (SST)											
		Validating and assimilating SAR											
Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation		Large Scale Prediction											
		National Unified Operational Prediction Capability											
		FALCON NRL-MRY											
		NCOM-4DVAR NRL-SSC											
		ESPC 1 : Coupled Global Prediction System -- NRL-MRY											
		-ESPC 1 : Coupled Global Prediction System -- NRL-SSC											
		NEPTUNE RTP											
	ESPC 10 Coupled Model Data Assimilation												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)					Project (Number/Name)		
1319 / 4					PE 0603207N / Air/Ocean Tactical Applications					2342 / METOC Data Assimilation and Models		
	ESPC 10 Coupled Model Data Assimilation											
	ESPC 1D Middle Atmosphere NRL-DC											
	ESPC 1D Middle Atmosphere NRL-MRY											
	ESPC 2: NRL-MRY											
	ESPC 2: NRL-SSC											
	ESPC 3: Coupled Global Ensemble Prediction System											
	ESPC 4 :Next Generation Model NEPTUNE											
	ESPC 4A - NexGen Ocean Model											
	ESPC 6 Climate Analysis LR Forecasting (ACAF) Navy											
	ESPC 8: Extended range Ensemble Prediction NRL-MRY											
	ESPC 8: Extended range Ensemble Prediction NRL-SSC											
	ESPC 8a: Navy ESPC NRL-MRY											
	ESPC 8a: Navy ESPC -- NRL-SSC											
	ESPC 9 National ESPC Committee Support -- NRL-MRY											
	ESPC 9 National ESPC Committee Support -- NRL-SSC											
	ESPC-7 Regional Arctic (Prediction) System -- NRL-MRY											
	ESPC-7 Regional Arctic (Prediction) System -- NRL-SSC											
	ESPC-99 Naval Capabilities Development and R2O											
	RTP Hi-res NAVGEM											
	MEOC Processing - assessments Numerical predictions computational efficiency assessments and Skill Assessments	ESPC 5: Computational Efficiency of Earth System Models - NRL-MRY										
ESPC 5: Computational Efficiency of Earth System Models - NRL												
ESPC 11: Integrated skill diagnostics - NRL-MRY												
ESPC 11: Integrated skill diagnostics - NRL-SSC												
ESPC-11A: Characterization and Assessment of Forecast Dropouts in NAVGEM												
METOC Processing - targeted and tactical scales												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications	Project (Number/Name) 2342 / METOC Data Assimilation and Modeling
Forward-based ocean and ocean acoustics modeling and data assimilation Numerical prediction in support of EM warfare and spectrum operations	Acoustic Propagation and Uncertainty Model Upgrades: NSPE v6	
	Global Ensemble Aerosol Prediction (ENAAPS)	
	Navy Aerosol Analysis and Prediction System (NAAPS)	
	ESPC 1 C NAVGEM Aerosol Model Development / NAVGEM In-Line NAAPS	
	BUILDER SUPPORT - NRL-DC	
		BUILDER SUPPORT - NIWC PAC
	RTP: Physics-based Ionosphere Model	
	Environmental and Tropical	
	Sphere Array Through-The-Sensor Bottom Loss Processing -- METRON Scientific Solutions, Inc.	
	Sphere Array Through-The-Sensor Bottom Loss Processing -- NRL	
Numerical prediction in support of Tropical Cyclone characterization Through-the-sensor environmental data collections	COAMPS-OS	
	Small Scale Atmospheric Models	
	Small scale oceanography	
2024OSD - 0603207N - 2342 Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation		

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603207N / <i>Air/Ocean Tactical Applicati</i> <i>ons</i>	Project (Number/Name) 2342 / <i>METOC Data Assimilation and Mod</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2342				
METOC Processing - global and theater scales: Numerical prediction in support of Precise Time and Astrometry: NAVGEM Upgrade for Improved Earth Orientation Parameters -- NRL-MRY	1	2022	4	2025
METOC Processing - global and theater scales: Oceanographic and Ocean Acoustics Database Development: Biological scattering and attenuation at tactical frequencies -- APL-JHU	1	2022	4	2023
METOC Processing - global and theater scales: Oceanographic and Ocean Acoustics Database Development: Boundary Interactions - TOTLOS Improvements -- APL-UW	1	2022	4	2023
METOC Processing - global and theater scales: Oceanographic and Ocean Acoustics Database Development: Cloud Enablement of Ocean and Atmospheric Master Library -- NRL-SSC	1	2022	4	2026
METOC Processing - global and theater scales: Oceanographic and Ocean Acoustics Database Development: "OAML Models and Database Verification, Validation and Enhancement	1	2022	4	2024
METOC Processing - global and theater scales: Oceanographic and Ocean Acoustics Database Development: The Improved Synthetic Ocean Profiles (ISOP), Version 2 -- NRL-SSC	1	2022	4	2023
METOC Processing - global and theater scales: Satellite-based environmental monitoring for, analysis, assimilation and modeling: Advanced Satellite Data Assimilation -- NRL-MRY	1	2022	4	2026
METOC Processing - global and theater scales: Satellite-based environmental monitoring for, analysis, assimilation and modeling: Aerosol observations for NAAPS validation -- NRL-MRY	1	2022	4	2026

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications		Project (Number/Name) 2342 / METOC Data Assimilation and Modeling	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
METOC Processing - global and theater scales: Satellite-based environmental monitoring for, analysis, assimilation and modeling: Mean sea surface height for Sentinel -3A/B x -- NRL-SSC		1	2022	4	2025
METOC Processing - global and theater scales: Satellite-based environmental monitoring for, analysis, assimilation and modeling: Modeling, Sensing and Forecasting Ocean Optical Products		1	2022	4	2024
METOC Processing - global and theater scales: Satellite-based environmental monitoring for, analysis, assimilation and modeling: NFLUX: Ocean Surface Bias Detection and Correction Using Satellites		1	2022	4	2024
METOC Processing - global and theater scales: Satellite-based environmental monitoring for, analysis, assimilation and modeling: Operationally implementing sat-derived ice products		1	2022	4	2026
METOC Processing - global and theater scales: Satellite-based environmental monitoring for, analysis, assimilation and modeling: Satellite Aerosol Data Assimilation -- NRL-MRY		1	2022	4	2026
METOC Processing - global and theater scales: Satellite-based environmental monitoring for, analysis, assimilation and modeling: Space METOC: Sea Surface Temp (SST) -- NRL-SSC		1	2022	4	2023
METOC Processing - global and theater scales: Satellite-based environmental monitoring for, analysis, assimilation and modeling: Validating and assimilating SAR		1	2022	4	2025
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: Large Scale Prediction -- NRL-SSC		1	2022	4	2024
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: National Unified Operational Prediction Capability		1	2022	4	2025
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: FALCON NRL-MRY		1	2022	4	2026

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications		Project (Number/Name) 2342 / METOC Data Assimilation and Models	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: NCOM-4DVAR NRL-SSC		1	2022	4	2024
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: ESPC 1 : Coupled Global Prediction System -- NRL-MRY		1	2022	4	2025
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: ESPC 1 : Coupled Global Prediction System -- NRL-SSC		1	2022	4	2025
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: NEPTUNE RTP		1	2022	4	2026
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: ESPC 10 Coupled Model Data Assimilation -- NRL-MRY		1	2022	4	2024
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: ESPC 10 Coupled Model Data Assimilation -- NRL-SSC		1	2022	4	2024
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: ESPC 1D Middle Atmosphere NRL-DC		1	2022	4	2025
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: ESPC 1D Middle Atmosphere NRL-MRY		1	2022	4	2025
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: ESPC 2: NRL-MRY		1	2022	4	2025
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: ESPC 2: NRL-SSC		1	2022	4	2025

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

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Appropriation/Budget Activity

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R-1 Program Element (Number/Name)

PE 0603207N / Air/Ocean Tactical Applications

Project (Number/Name)

2342 / METOC Data Assimilation and Models

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: ESPC 3: Coupled Global Ensemble Prediction System	1	2022	4	2025
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: ESPC 4 :Next Generation Model NEPTUNE -- NRL-MRY	1	2022	4	2025
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: ESPC 4A - NexGen Ocean Model -- NRL-SSC	1	2022	4	2025
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: ESPC 6 Climate Analysis LR Forecasting (ACAF) Navy	1	2022	4	2025
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: ESPC 8: Extended range Ensemble Prediction NRL-MRY	1	2022	4	2025
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: ESPC 8: Extended range Ensemble Prediction NRL-SSC	1	2022	4	2025
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: ESPC 8a: Navy ESPC NRL-MRY	1	2022	4	2025
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: ESPC 8a: Navy ESPC -- NRL-SSC	1	2022	4	2025
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: ESPC 9 National ESPC Committee Support -- NRL-MRY	1	2022	4	2025
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: ESPC 9 National ESPC Committee Support -- NRL-SSC	1	2022	4	2025

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

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Appropriation/Budget Activity

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R-1 Program Element (Number/Name)

PE 0603207N / Air/Ocean Tactical Applications

Project (Number/Name)

2342 / METOC Data Assimilation and Mod

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: ESPC-7 Regional Arctic (Prediction) System -- NRL-MRY	1	2022	4	2025
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: ESPC-7 Regional Arctic (Prediction) System -- NRL-SSC	1	2022	4	2025
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: ESPC-99 Naval Capabilities Development and R2O	1	2022	4	2025
METOC Processing - global and theater scales: Unified, coupled and ensemble environmental numerical prediction, modeling and data assimilation: RTP Hi-res NAVGEM -- NRL-MRY	1	2022	4	2024
MEOC Processing - assessments: Numerical predictions computational efficiency assessments and Skill Assessments: ESPC 5: Computational Efficiency of Earth System Models - NRL-MRY	1	2022	4	2024
MEOC Processing - assessments: Numerical predictions computational efficiency assessments and Skill Assessments: ESPC 5: Computational Efficiency of Earth System Models - NRL-SSC	1	2022	4	2024
MEOC Processing - assessments: Numerical predictions computational efficiency assessments and Skill Assessments: ESPC 11: Integrated skill diagnostics - NRL-MRY	1	2022	4	2024
MEOC Processing - assessments: Numerical predictions computational efficiency assessments and Skill Assessments: ESPC 11: Integrated skill diagnostics - NRL-SSC	1	2022	4	2024
MEOC Processing - assessments: Numerical predictions computational efficiency assessments and Skill Assessments: ESPC-11A: Characterization and Assessment of Forecast Dropouts in NAVGEM - NRL-MRY	1	2022	4	2025
METOC Processing - targeted and tactical scales: Forward-based ocean and ocean acoustics modeling and data assimilation: Acoustic Propagation and Uncertainty Model Upgrades: NSPE v6	1	2022	4	2024

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

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R-1 Program Element (Number/Name)

PE 0603207N / Air/Ocean Tactical Applications

Project (Number/Name)

2342 / METOC Data Assimilation and Mod

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
METOC Processing - targeted and tactical scales: Numerical prediction in support of EM warfare and spectrum operations: Global Ensemble Aerosol Prediction (ENAAPS) -- NRL-DC	1	2022	4	2025
METOC Processing - targeted and tactical scales: Numerical prediction in support of EM warfare and spectrum operations: Navy Aerosol Analysis and Prediction System (NAAPS) -- NRL-MRY	1	2022	4	2025
METOC Processing - targeted and tactical scales: Numerical prediction in support of EM warfare and spectrum operations: ESPC 1 C NAVGEM Aerosol Model Development / NAVGEM In-Line NAAPS -- NRL-MRY	1	2022	4	2026
METOC Processing - targeted and tactical scales: Numerical prediction in support of EM warfare and spectrum operations: BUILDER SUPPORT - NRL-DC	1	2022	4	2027
METOC Processing - targeted and tactical scales: Numerical prediction in support of EM warfare and spectrum operations: BUILDER SUPPORT - NIWC PAC	1	2024	4	2027
METOC Processing - targeted and tactical scales: Numerical prediction in support of EM warfare and spectrum operations: RTP: Physics-based Ionosphere Model - Upgrades NRL-DC / APL-JHU / ARL-UT	1	2022	4	2027
METOC Processing - targeted and tactical scales: Numerical prediction in support of Tropical Cyclone characterization: Environmental and Tropical NRL-MRY	1	2022	4	2026
METOC Processing - targeted and tactical scales: Through-the-sensor environmental data collections: Sphere Array Through-The-Sensor Bottom Loss Processing -- METRON Scientific Solutions, Inc.	1	2022	4	2026
METOC Processing - targeted and tactical scales: Through-the-sensor environmental data collections: Sphere Array Through-The-Sensor Bottom Loss Processing -- NRL-DC	1	2022	4	2024
METOC Processing - targeted and tactical scales: Through-the-sensor environmental data collections: COAMPS-OS and NEPTUNE-OS- NRL-MRY	1	2022	4	2026
METOC Processing - targeted and tactical scales: Through-the-sensor environmental data collections: Small Scale Atmospheric Models -- NRL-MRY	1	2022	4	2024

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications	Project (Number/Name) 2342 / METOC Data Assimilation and Mod		
		Start		End
Events by Sub Project	Quarter	Year	Quarter	Year
METOC Processing - targeted and tactical scales: Through-the-sensor environmental data collections: Small scale oceanography -- NRL-SSC	1	2022	4	2024
METOC Processing - targeted and tactical scales: Through-the-sensor environmental data collections: Global aerosol forecasting capability and integration with NEPTUNE	1	2024	4	2027
METOC Processing - targeted and tactical scales: Through-the-sensor environmental data collections: Integrate improved coupled ocean-atmosphere modeling	1	2024	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications				Project (Number/Name) 2344 / Precise Time and Astrometry			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2344: Precise Time and Astrometry	16.508	2.157	7.091	8.689	-	8.689	5.660	4.627	4.452	4.540	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Precise Timing and Astrometry (PTA) project funds research and development of improvements for the Master Clock (MC) System, the Department of Defense (DoD) Time Transfer capability, the Earth Orientation System, and the Astrometric Observation System. The MC System and Time Transfer provides precise time for use in modern military and National Technical Means (NTM) navigation, guidance, positioning, and tracking systems. The Earth Orientation System provides precise Earth Orientation Parameters (EOP) for use by the DoD and national civilian infrastructure to establish the specific orientation of the Earth and to provide input to the terrestrial reference frame. The Astrometric Observation System provides the basic data needed to generate the Celestial Reference Frame (CRF) which is the standard for calibrating all inertial navigation systems, satellite orbits, and earth rotation determinations. Improvement to the MC System, Time Transfer, Earth Orientation, and Astrometric Observation Systems are needed to ensure that new and upgraded DoD and NTM capabilities meet their performance requirements. The U.S. Naval Observatory (USNO), is responsible for coordinating Precise Time and Time Interval (PTTI) requirements and for maintaining a PTTI reference standard (astronomical and atomic) for use by all DoD, federal agencies, and related scientific laboratories. The Navy is also responsible for providing CRF data for military and NTM navigation, positioning, and guidance capabilities to all DoD.

The PTA research and development efforts are focused on several areas relating to timing and time transfer: (1) Fielding of Rubidium Fountain Atomic Clocks and development of improved Global Positioning System (GPS) Timing Receivers in order to meet the precise timing requirements for the GPS III system; (2) Research & development of the capability of distributing timing signals via Optical fiber lines, as an alternative and backup to GPS time distribution; and (3) Research & development (R&D) into Optical Clock technology, which is expected to be required for future DoD systems. The PTA research and development effort is also focused on the following areas related to EOP determination: (1) Upgrade of the Very Long Baseline Interferometry (VLBI) data acquisition system (2) Development of a Software (SW) Correlator for processing of VLBI data, necessary for the generation of EOP data; (3) Development of the capability for electronic transmission of the VLBI data from remote VLBI sites to the USNO correlator. The new SW Correlator and VLBI infrastructure upgrades are necessary in order to support daily updates of EOP data required by GPS III; (4) Development of an automated end-to-end EOP processing system, which combines input from multiple data sets (e.g. VLBI data, GPS orbit data, and laser ranging data, etc.). Automation is necessary to meet future DoD and GPS requirements; (5) Modifications to the EOP system for compatibility with the new international standard. PTA research and development for astrometry focuses on 1) Telescope research and deployment 2) research into the development of a GPS-denied reference frame as a navigation solution 3) instrumentation development across all wavelengths relevant to the DoD. These activities are necessary for producing CRF products in an era of new surveillance, targeting, intelligence, and reconnaissance technologies and instrumentation.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Precise Timing and Astronomy	2.157	7.091	8.689	0.000	8.689
Articles:	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications		Project (Number/Name) 2344 / Precise Time and Astrometry	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>FY 2023 Plans:</p> <ul style="list-style-type: none">- Continue development of the next generation GPS III receiver--move to operations in FY24- Optical Time Transfer: Fiber and Free Space optical time transfer capability development- Optical Clock Development: Demonstrate laser trapping (lattice)- Operational Clock upgrades/advancements (laser upgrades, test monolithic optical assembly)- Earth Orientation Combination and Prediction Optimal Estimation Investigation: Validate R&D code implementation and test- Earth Orientation Monitoring of Foreign GNSS experiment: Refine current non-GPS Global Navigation Satellite System processing.- Begin the development of the next generation Infrared (IR) camera: ASTROCAM- Develop Cislunar instrumentation for cislunar orientation study- Fund team of Research, Development, Test & Evaluation (RDTE) researchers to progress Optical Clock Development, Optical/Radio offsets in Active Galactic Nuclei study (FRAMEX), and next generation GPS denied navigation studies- Fund post-doctoral program to support basic research in Precise Time and Astrometry <p>FY 2024 Base Plans:</p> <ul style="list-style-type: none">- Finalize development of GPS III receiver--move to operations with Other Procurement Navy (OPN) tail in late FY24- Optical Time Transfer: Fiber and Free Space optical time transfer capability development- Optical Clock Development: Demonstrate cooling and develop final version of vacuum chamber- Operational Clock upgrades/advancements (laser upgrades, test slow atomic beam, component testing)- Earth Orientation Combination and Prediction Optimal Estimation Investigation: Validate R&D code implementation and test- Earth Orientation Monitoring of Foreign GNSS experiment: Begin validation operational implementation.- Continue the development of the next generation IR camera: ASTROCAM- Fund team of RDTE researchers to progress Optical Clock Development, Optical/Radio offsets in Active Galactic Nuclei study (FRAMEX), and next generation GPS denied navigation studies- Fund post-doctoral program to support basic research in Precise Time and Astrometry <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications		Project (Number/Name) 2344 / Precise Time and Astrometry		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
\$1.598K increase from FY23 to FY24 funds new U.S. Naval Observatory (USNO) Master Clock technologies.						
Accomplishments/Planned Programs Subtotals		2.157	7.091	8.689	0.000	8.689
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
The included technology developments are lead in-house with selected contractor participation.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications				Project (Number/Name) 2344 / Precise Time and Astrometry					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary HW Development (NPOI) 1.8m Telescope Project (1)	SS/FFP	Lowell Observatory : Flagstaff, AZ	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	-
Primary HW Development (NPOI) 1.8m Telescope (2)	SS/FFP	AZ Embedded System : Not Specified	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	-
Ancillary HW Development 1	Various	U.S. Naval Observatory : Washington, DC	0.309	0.089	Dec 2021	0.125	Dec 2022	0.187	Sep 2024	-		0.187	0.000	0.710	-
Ancillary HW Development 2	Various	U.S. Naval Observatory : Washington, DC	0.308	0.089	Jan 2022	0.125	Jan 2023	0.174	Jan 2024	-		0.174	0.000	0.696	-
Ancillary HW Development 3	Various	U.S. Naval Observatory : Washington, DC	0.346	0.090	Apr 2022	0.125	Apr 2023	0.174	Apr 2024	-		0.174	0.000	0.735	-
Ancillary HW Development 4	Various	U.S. Naval Observatory : Washington, DC	0.251	0.090	Jul 2022	0.125	Jul 2023	0.174	Jul 2024	-		0.174	0.000	0.640	-
Next Generation Secure Time Transfer	TBD	TBD : Not Specified	1.865	0.000		0.000		0.000		-		0.000	0.000	1.865	-
1.8 meter infrared camera development	TBD	NAVSEA : University of Hawaii	2.008	0.000		0.000		0.000		-		0.000	0.000	2.008	-
Primary Hardware Development (Antenna Receiver Electronics)	C/FFP	NASA : GSFC	1.000	0.000		0.000		0.000		-		0.000	0.000	1.000	-
Primary Hardware Development (Site Prep)	SS/FFP	NASA/GSFC : HI	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	-
1.8 meter Telescope Enclosure	C/FFP	NAVFAC SW : Not Specified	2.153	0.000		0.000		0.000		-		0.000	0.000	2.153	-
Advanced Time and Frequency Tranfer Upgrade	C/FFP	TBD : Not Specified	0.900	0.307	Apr 2022	0.850	Apr 2023	0.837	Apr 2024	-		0.837	0.000	2.894	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications					Project (Number/Name) 2344 / Precise Time and Astrometry				
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Optical Lattice Clocks	C/FFP	U.S. Naval Observatory : Washington, DC	0.710	0.100	Jul 2022	0.500	Jul 2023	0.698	Jul 2024	-		0.698	0.000	2.008	-
GPS III Receiver	Various	NAVSEA: University of Texas : Austin, Texas	1.239	1.000	Jan 2022	1.265	Jan 2023	0.307	Jan 2024	-		0.307	0.000	3.811	-
TST Replacement	Various	U.S. Naval Observatory : Washington, DC	0.135	0.000	Jul 2022	0.000		0.000		-		0.000	0.000	0.135	-
Modem	TBD	NAVSEA: APL : Not Specified	0.000	0.000		0.250	Jan 2023	0.349	Jan 2024	-		0.349	0.000	0.599	-
Astrocarn	C/FFP	TBD: NAVSUP Contracted : Not Specified	0.000	0.000		0.452	Mar 2023	1.725	Jan 2024	-		1.725	0.000	2.177	-
ARGOS/Cislunar Instrumentation	C/FFP	TBD:NAVSUP- Contracted : Not Specified	0.000	0.000		0.449	Mar 2023	0.000		-		0.000	0.000	0.449	-
Subtotal			12.024	1.765		4.266		4.625		-		4.625	0.000	22.680	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support (All PTA - Labor) 1	Allot	U.S. Naval Observatory (Civilian Labor) : Washington, DC	0.603	0.000		0.363	Dec 2022	0.536	Dec 2023	-		0.536	Continuing	Continuing	Continuing
Development Support (All PTA - Labor) 2	Allot	U.S. Naval Observatory (Civilian Labor) : Washington, DC	0.603	0.000		0.363	Jan 2023	0.536	Jan 2024	-		0.536	Continuing	Continuing	Continuing
Development Support (All PTA - Labor) 3	Allot	U.S. Naval Observatory (Civilian	0.603	0.000		0.363	Apr 2023	0.536	Apr 2024	-		0.536	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications						Project (Number/Name) 2344 / Precise Time and Astrometry			
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Labor) : Washington, DC													
Development Support (All PTA - Labor) 4	Allot	U.S. Naval Observatory (Civilian Labor) : Washington, DC	0.603	0.000		0.363	Jul 2023	0.536	Jul 2024	-		0.536	Continuing	Continuing	Continuing
Development Support (ALL PTA - Labor) 1 CTR	Allot	U.S. Naval Observatory : Washington, DC	0.000	0.000		0.600	Jan 2023	0.888	Jan 2024	-		0.888	0.000	1.488	-
EOP Optimal Estimation	C/FFP	U.S. Naval Observatory : Washington, DC	0.607	0.224	Feb 2022	0.250	Jan 2023	0.349	Jan 2024	-		0.349	0.500	1.930	-
Foreign GNSS	C/FFP	U.S. Naval Observatory : Washington, DC	0.612	0.168	Jan 2022	0.250	Jan 2023	0.349	Jan 2024	-		0.349	0.500	1.879	-
SLAC Software Upgrade	C/FFP	Classified : Not Specified	0.230	0.000		0.000		0.000		-		0.000	0.690	0.920	-
Primary Hardware Development (NPOI) 1.8m Telescope Project (2)	SS/FFP	NASA : Varies	0.342	0.000		0.000		0.000		-		0.000	0.000	0.342	-
SIBR Placeholder	SS/FFP	NASA : Varies	0.281	0.000		0.273	Mar 2023	0.334	Mar 2024	-		0.334	0.000	0.888	-
Subtotal			4.484	0.392		2.825		4.064		-		4.064	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering and Development Services	Various	Classified-4 : Not Specified	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Engineering and Development Services	Various	Classified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Subtotal			0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications					Project (Number/Name) 2344 / Precise Time and Astrometry			
	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	16.508	2.157		7.091		8.689		-		8.689	Continuing	Continuing	N/A

Remarks

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PE 0603207N: *Air/Ocean Tactical Applications*
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2344 / Precise Time and Astrometry

Precise Timing and Astronomy (PTA)	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Master Clock System					Rb FOC MC																							
													OFT Xmsn															
	FTT - Balt/DC																											
					FTT - Urban																							
	Master Clock System; Optical Clock Development																											
GPS M-Code Receiver	GPS Denied Navigation Pipeline																											
	M-Code IOC USNO																											
													M-Code FOC USNO															
USNO	FOC																											
	modem																											
1.8m Telescope Deployment					FAC-D																							
	Development of 1.8m Robotic Adaptive Optics System																											

2024DON - 0603207N - 2344.L60

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

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R-1 Program Element (Number/Name)

PE 0603207N / Air/Ocean Tactical Applications

Project (Number/Name)

2344 / Precise Time and Astrometry

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Precise Timing and Astronomy (PTA)				
Master Clock System: Rb Full Operational Capability (FOC) - AMC	1	2022	2	2024
Master Clock System: Optical Fiber Time (OFT) Transmission	1	2022	4	2027
Master Clock System: Fiber Time Transmission (FTT) in Baltimore/DC Area	2	2022	4	2022
Master Clock System: Fiber Time Transmission - Urban Demo	4	2022	4	2022
Master Clock System: Master Clock System; Optical Clock Development	1	2022	4	2027
GPS M-Code Receiver: GPS Denied Navigation Pipeline	1	2022	4	2022
GPS M-Code Receiver: M-Code IOC at USNO	2	2022	4	2022
GPS M-Code Receiver: M-Code FOC at USNO	1	2022	4	2024
USNO: Transition Earth Orientation Parameters (EOP) Automation software to operations (FOC)	1	2022	1	2023
USNO: Next Generation Time Transfer Transceiver (modem) CDR, transition to operations	1	2022	2	2023
1.8m Telescope Deployment: FAC-D Development for Telescope Enclosure	1	2022	4	2024
1.8m Telescope Deployment: Development of 1.8m Robotic Adaptive Optics System	1	2022	4	2024
1.8m Telescope Deployment: GPSIII development	1	2022	2	2025
1.8m Telescope Deployment: EO Optimal Estimation	2	2022	4	2027
1.8m Telescope Deployment: EO Foreign GNSS	1	2022	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications				Project (Number/Name) 2363 / Remote Sensing Capability Development			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2363: Remote Sensing Capability Development	2.829	0.314	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.143
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Remote Sensing Capability Development characterizes the ocean environment using a variety of remote sensing techniques that provide that capability to discriminate atypical oceanographic phenomena from the natural environment that will greatly improve undersea dominance capabilities. The Naval Oceanographic Office will employ oceanographic data to refine and extend environmental characterization of the phenomena and disseminate data to the Fleet.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Remote Sensing Capability Dev.								0.314	0.000	0.000	0.000	0.000
Articles:								-	-	-	-	-
Description: Collect remote sensing and ground truth data in various weather and sea states to broaden the range of environmental conditions and reduce uncertainty in environmental prediction. Develop and enhance software algorithms to automatically detect oceanographic phenomena. Integrate algorithms for access over the network. Enhance existing toolsets to provide users robust applications to assist in their daily tasks. Develop training to provide the user community education on using the different tools and applications. (Details held at a higher classification)												
FY 2023 Plans: N/A												
FY 2024 Base Plans: N/A												
FY 2024 OCO Plans: N/A												
Accomplishments/Planned Programs Subtotals								0.314	0.000	0.000	0.000	0.000
C. Other Program Funding Summary (\$ in Millions)												
N/A												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications	Project (Number/Name) 2363 / Remote Sensing Capability Development
C. Other Program Funding Summary (\$ in Millions)		
Remarks		
D. Acquisition Strategy		
Remote Sensing Capability Development is being managed as a PEO Project leveraging the Rapid Development and Deployment (RDD) construct for rigor and discipline.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications						Project (Number/Name) 2363 / Remote Sensing Capability Development			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
REMOTE SENSING CAPABILITY DEVELOPMENT DATA COLLECTION	Various	VARIOUS : VARIOUS	1.211	0.314	Nov 2021	0.000		0.000		-		0.000	5.176	6.701	-
Subtotal			1.211	0.314		0.000		0.000		-		0.000	5.176	6.701	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	SSC Pacific : SAN DIEGO, CA	1.081	0.000		0.000		0.000		-		0.000	0.375	1.456	-
Subtotal			1.081	0.000		0.000		0.000		-		0.000	0.375	1.456	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Remote Sensing Capability Development Data Collection	C/FP	BAH : VA	0.537	0.000		0.000		0.000		-		0.000	0.374	0.911	-
Subtotal			0.537	0.000		0.000		0.000		-		0.000	0.374	0.911	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			2.829	0.314		0.000		0.000		-		0.000	5.925	9.068	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

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R-1 Program Element (Number/Name)

PE 0603207N / Air/Ocean Tactical Applications

Project (Number/Name)

2363 / Remote Sensing Capability Development

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications	Project (Number/Name) 2363 / Remote Sensing Capability Development	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Remote Sensing Capability Dev.				
Data Collection:: Schedule Detail	1	2022	2	2022
Algorithm Development:: Schedule Detail	1	2022	1	2022
System Integration:: Schedule Detail	3	2022	4	2022
Testing:: Schedule Detail	1	2022	4	2022
System Engineering:: Schedule Detail	1	2022	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications				Project (Number/Name) 3207 / Fleet Synthetic Training			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3207: Fleet Synthetic Training	3.487	0.000	0.002	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.489
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Fleet Synthetic Training (FST) provides Naval Forces with an enhanced in-port training capability. This effort provides more effective training for our deploying naval forces by integrating embedded shipboard training devices, aircraft, and submarine simulators into an interoperable network with joint, coalition, and interagency partners.

The required training is based on realistic characterizations of the physical environment, a key factor in achieving this new way of training Naval Forces. This project develops and delivers software that characterizes the ocean and atmospheric environments; adjusts to meet fleet-required training scenarios; allows synthetic training to be conducted in areas of planned and contingency operations and provides sufficient detail to simulate the real-world conditions of the physical environment in those areas of interest.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Fleet Synthetic Training	0.000	0.002	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Ballistic Missile Defense (BMD) Fleet Synthetic Training (FST) at sea effort will provide the capability to conduct integrated Live, Virtual, and Constructive (LVC) single or multi-ship exercises with ships at sea using the Navy Continuous Training Environment (NCTE). This capability will support BMD mission area Fleet training and mission rehearsal in theater, allow ships to participate in Combatant Command (CCMD) mandated BMD exercises while pier-side or underway, as well as enhance BMD training objective accomplishment in current Optimized Fleet Response Plan (O-FRP) underway training events such as Composite Training Unit Exercises (COMPTUEX) and Joint Task Force Exercises (JTFEX). The NCTE and FST directly support Fleet training readiness, strike group and BMD platform deployment certifications.					
FY 2023 Plans: FY23 completion of FST/LVC providing integrated live, virtual, and constructive single or multi-ship exercises in support of Ballistic Missile Defense (BMD). FY23 funding in amount of \$0.002M provided to ensure final project closeout					
FY 2024 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications		Project (Number/Name) 3207 / Fleet Synthetic Training		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
FY 2024 OCO Plans:						
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement:						
FY24 reduction due to final project closeout.						
Accomplishments/Planned Programs Subtotals		0.000	0.002	0.000	0.000	0.000
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
The included technology developments are primarily in-house with contractor participation through existing vehicles.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications						Project (Number/Name) 3207 / Fleet Synthetic Training			
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	C/FFP	AER : VA	0.874	0.000	Sep 2022	0.002	Sep 2023	0.000		-		0.000	0.000	0.876	-
Software Development	C/FFP	AER : VA	0.367	0.000		0.000		0.000		-		0.000	0.000	0.367	-
Configuration Management	C/FFP	AER : VA	0.482	0.000		0.000		0.000		-		0.000	0.000	0.482	-
Studies and Analysis	C/FFP	AER : VA	0.582	0.000		0.000		0.000		-		0.000	0.000	0.582	-
Award Fees	C/FFP	NAWC TSD (Orlando, FL) : FL	0.146	0.000		0.000		0.000		-		0.000	0.000	0.146	-
Technical Data	C/FFP	N/A : N/A	0.119	0.000		0.000		0.000		-		0.000	0.000	0.119	-
Subtotal			2.570	0.000		0.002		0.000		-		0.000	0.000	2.572	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	C/FFP	AER : VA	0.917	0.000		0.000		0.000		-		0.000	0.000	0.917	-
Subtotal			0.917	0.000		0.000		0.000		-		0.000	0.000	0.917	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			3.487	0.000		0.002		0.000		-		0.000	0.000	3.489	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy												Date: March 2023							
Appropriation/Budget Activity 1319 / 4								R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications								Project (Number/Name) 3207 / Fleet Synthetic Training			

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 3207																												
Fleet Synthetic Training: Database Development:																												
Fleet Synthetic Training: Architecture:																												
Fleet Synthetic Training: Performance Surface Improvements:																												
Fleet Synthetic Training: Development Work:																												
Fleet Synthetic Training: Studies:																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications	Project (Number/Name) 3207 / Fleet Synthetic Training	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3207				
Fleet Synthetic Training: Database Development:	1	2022	1	2023
Fleet Synthetic Training: Architecture:	1	2022	4	2022
Fleet Synthetic Training: Performance Surface Improvements:	1	2022	4	2022
Fleet Synthetic Training: Development Work:	1	2022	4	2022
Fleet Synthetic Training: Studies:	1	2022	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications				Project (Number/Name) 3404 / Tactical Environmental Support			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3404: Tactical Environmental Support	7.880	1.913	3.168	3.100	-	3.100	2.878	2.929	2.975	3.035	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Tactical Environmental Support Project (3404) enables the future warfighter to leverage environmental data gathered, assimilated and predicted under Projects 2341 (METOC Collections) and 2342 (METOC processing) by incorporating them into warfighting technological, net-centric applications that shape the way in which commanders engage the enemy, take full advantage of environmental conditions (and their impacts on systems and sensors) and complete the mission in the most efficient manner feasible. These software decision support tools complement the capabilities found in the Naval Integrated Tactical Environmental System Next Generation (NITES-Next) Program of Record, and provide platform, sensor, communications, and weapon systems performance assessments for littoral and deep-strike warfighters. The following warfighting disciplines benefit directly from these METOC Exploitation capabilities: (1) Undersea Warfare(USW), Anti-Submarine Warfare(ASW), Mine Warfare(MIW), Amphibious Warfare(AMW), Anti-Surface Warfare (ASUW), Anti-Air Warfare, (AAW), Strike Warfare(STW), Expeditionary Warfare(EXW), Electronic Warfare (EW), Information Operations (IO), Intelligence Operations(INT), Non-Combat Operations (NCO), Command, Control, Communication (CCC), and Naval Special Warfare(NSW).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Tactical Environmental Support	1.913	3.168	3.100	0.000	3.100
Articles:	-	-	-	-	-
Description: The Tactical Environmental Support Project (3404) enables the future warfighter to leverage environmental data gathered, assimilated and predicted under Projects 2341 (METOC Collections) and 2342 (METOC processing) by incorporating them into warfighting technological, net-centric applications that shape the way in which commanders engage the enemy, take full advantage of environmental conditions (and their impacts on systems and sensors) and complete the mission in the most efficient manner feasible. These software decision support tools complement the capabilities found in the Naval Integrated Tactical Environmental System Next Generation (NITES-Next) POR, and provide platform, sensor, communications, and weapon systems performance assessments for littoral and deep-strike warfighters.					
The following warfighting disciplines benefit directly from these METOC Exploitation capabilities (1) Undersea Warfare (USW), Anti-Submarine Warfare (ASW), Mine Warfare (MIW), Amphibious Warfare (AMW), Anti-Surface Warfare (ASUW), Anti-Air Warfare, (AAW), Strike Warfare (STW), Expeditionary Warfare (EXW), Electronic Warfare (EW), Information Operations (IO), Intelligence Operations (INT), Non-Combat Operations					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023				
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications	Project (Number/Name) 3404 / Tactical Environmental Support				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>(NCO), Command, Control, Communication (CCC), and Naval Special Warfare (NSW). Accomplishments and plans described below are examples for each effort category.</p> <p>FY 2023 Plans:</p> <p>-Continue to add capability to the Interactive Scenario Builder Tactical Decision Aid (BUILDER). Specific elements including improved boundary layer characteristics (focused on vertical refractivity profiles), integration of expanded METOC numerical model information, and demonstration of probabilistic ensemble information to better inform uncertainty range of applications given environmental variability.</p> <p>-Continue to transition ocean acoustic prediction and database innovations via the Scalable Tactical Acoustic Propagation Loss Engine project, which leverages ties to USW programs of record via the APB/CPB incremental build processes.</p> <p>-Continue to transition Ocean-Atmosphere Master Library (OAML) model and database improvements into the Scalable Tactical Acoustic Propagation Loss Engine (STAPLE). The objective is to provide state-of-the-art propagation models and tactical environmental information to ASW units.</p> <p>-Continue to Leverage lessons learned from NAVSLaM to create a holistic approach to atmospheric boundary laryer turbulence observation, data-basing and modeling, as they pertains to Navy tactical problems.</p> <p>-Continue enhancements to newly fielded RF and EO capabilities per fleet feedback, including efforts to transition tactical EMW and undersea warfare environmental information dissemination systems, and adoption of new tactical decision aid capabilities.</p> <p>-Completion and demonstration of integrating the High Frequency skywave propagation code into the BUILDER EM/EW tactical decision aid.</p> <p>FY 2024 Base Plans:</p> <p>- Continue to add capability to the Interactive Scenario Builder Tactical Decision Aid (BUILDER). Specific elements including improved boundary layer characteristics (focused on vertical refractivity profiles), integration of expanded METOC numerical model information, and demonstration of probabilistic ensemble information to better inform uncertainty range of applications given environmental variability.</p>							

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603207N / <i>Air/Ocean Tactical Applications</i>		Project (Number/Name) 3404 / <i>Tactical Environmental Support</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Continue to transition ocean acoustic prediction and database innovations via the Scalable Tactical Acoustic Propagation Loss Engine (STAPLE) project, which leverages ties to USW programs of record via the APB/CPB incremental build processes.</p> <p>- Continue to transition Ocean-Atmosphere Master Library (OAML) model and database improvements into the Scalable Tactical Acoustic Propagation Loss Engine (STAPLE). The objective is to provide state-of-the-art propagation models and tactical environmental information to ASW units.</p> <p>- Continue enhancements to newly fielded RF and EO capabilities per fleet feedback, including efforts to transition tactical EMW and undersea warfare environmental information dissemination systems, and adoption of new tactical decision aid capabilities.</p> <p>- Conclude incorporating lessons learned from NAVSLaM to create a holistic approach to atmospheric boundary layer turbulence observation, data-basing and modeling.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: There is no significant funding change from FY 2023 to FY 2024.</p>						
Accomplishments/Planned Programs Subtotals		1.913	3.168	3.100	0.000	3.100
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy Acquisition, management and contracting strategies are to support the Tactical Environmental Support Project to develop, demonstrate and validate products and decision aids to understand and predict the impact of the environment on military operations.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023					
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications						Project (Number/Name) 3404 / Tactical Environmental Support					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total					
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract		
METOC Tactical Environmental Support	WR	NRL : Washington, DC	4.436	0.300	Nov 2021	1.230	Nov 2022	1.138	Nov 2023	-		1.138	0.000	7.104	-		
METOC Tactical Environmental Support	WR	NRL : Monterey, CD Stennis Space Center,MS	2.903	0.592	Nov 2021	0.854	Nov 2022	0.832	Nov 2023	-		0.832	Continuing	Continuing	Continuing		
METOC Tactical Environmental Support- Staple Transitions	WR	NSWC Carderock : West Bethesda, MD	0.541	0.400	Nov 2021	0.000		0.000		-		0.000	2.500	3.441	-		
METOC Tactical Environmental Support	C/FFP	Various : Various	0.000	0.621	Oct 2021	1.084	Oct 2022	1.130	Oct 2023	-		1.130	0.075	2.910	-		
Subtotal			7.880	1.913		3.168		3.100		-		3.100	Continuing	Continuing	N/A		
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals			7.880	1.913		3.168		3.100		-		3.100	Continuing	Continuing	N/A		
Remarks																	

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy													Date: March 2023																			
Appropriation/Budget Activity 1319 / 4													R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications								Project (Number/Name) 3404 / Tactical Environmental Support											
Proj 3404 METOC Exploitation - targeted and tactical scales Forward-based ocean and ocean acoustics modeling and data assimilation Numerical prediction in support of atmospheric acoustics characterization Numerical prediction in support of EM warfare and spectrum operations Oceanographic and Ocean Acoustics Database Development Satellite-based environmental monitoring for, analysis, assimilation and modeling Scalable, distributed and adaptive ocean data collections methodologies	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028							
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
	STAPLE Transitions																															
									Atmospheric Acoustic Propagation (AAP)																							
									RTP: Electromagnetic Spectrum Performance Products Ashore																							
	Improved Atmospheric Models for Electromagnetic Maneuver Warfare																															
	Navy Electro-Optical Sensor Performance Prediction																															
	TrueView team efforts																															
	Environmental Post-Mission Analysis																															
	Products from Satellite Sensors																															
	CAST: Cooperative Autonomous Sensing Team																															
Guidance for Heterogeneous Observation Systems																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603207N / Air/Ocean Tactical Applications

Project (Number/Name)

3404 / Tactical Environmental Support

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3404				
Forward-based ocean and ocean acoustics modeling and data assimilation: STAPLE Transitions -- NSWCCD	1	2022	4	2023
Numerical prediction in support of atmospheric acoustics characterization: Atmospheric Acoustic Propagation (AAP) -- NRL-MRY	1	2023	4	2026
Numerical prediction in support of EM warfare and spectrum operations: RTP: Electromagnetic Spectrum Performance Products Ashore -- NRL-MRY / NRL-DC / NIWC-PAC	1	2023	4	2026
Numerical prediction in support of EM warfare and spectrum operations: Improved Atmospheric Models for Electromagnetic Maneuver Warfare -- NPS	1	2022	4	2025
Numerical prediction in support of EM warfare and spectrum operations: REFRACTIVITY PROFILE SUPPORT -- NRL-MRY	1	2022	4	2024
Numerical prediction in support of EM warfare and spectrum operations: NEOSPP and EMSPPA and SSCPAC Code 55280 TrueView team efforts -- SSC-PAC	1	2023	4	2025
Oceanographic and Ocean Acoustics Database Development: Environmental Post-Mission Analysis - TTS ocean and atmosphere data collection -- NRL-SSC	1	2022	4	2024
Satellite-based environmental monitoring for, analysis, assimilation and modeling: Preparing Tactical Optical Ocean Products from Satellite Sensors -- NRL-SSC	1	2022	4	2025
Scalable, distributed and adaptive ocean data collections methodologies: CAST: Cooperative Autonomous Sensing Team -- APL-UW	1	2022	4	2022
Scalable, distributed and adaptive ocean data collections methodologies: Guidance for Heterogeneous Observation Systems (GHOST) -- NRL-SSC	1	2022	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications				Project (Number/Name) 3405 / Decision Support Products & Dissemination			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3405: Decision Support Products & Dissemination	3.545	1.120	1.216	1.245	-	1.245	1.265	1.289	1.309	1.335	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Decision Support Products & Dissemination efforts enable the future warfighter to leverage environmental data gathered, assimilated, predicted and exploited by optimizing data formatting, compression, packaging, depiction, data-basing and transfer methodologies that permit the rapid dissemination of actionable battlespace environmental (METOC) information over tactical and reach-back networks. This project ensures warfighters, commanders and those who support them are fully synchronized in terms of environmental data products shared among a multitude of platforms, systems and common operating pictures (COPs). METOC information is highly dynamic. Just as time synchronization is essential to navigation principles, timely METOC knowledge and information are vital to battlespace environmental exploitation, placing the warfighter and support elements in spatial and temporal synchronization, and at a collective advantage, in terms of the current and predicted states of the ocean and atmosphere.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Decision Support Products and Dissemination	1.120	1.216	1.245	0.000	1.245
Articles:	-	-	-	-	-
<p>Description: The Decision Support Products and Dissemination Project (3405) enables the future warfighter to leverage environmental data gathered, assimilated, predicted and exploited under Projects 2341 (METOC Collections), 2342 (METOC processing) and 3404 (METOC exploitation) by optimizing data formatting, compression, packaging, depiction, data-basing and transfer methodologies that permit the rapid dissemination of actionable battlespace environmental (METOC) information over tactical and reach-back networks. This project ensures warfighters, commanders and those who support them are fully synchronized in terms of environmental data products shared among a multitude of platforms, systems and common operating pictures (COPs). METOC information is highly dynamic. Just as time synchronization is essential to navigation principles, timely METOC knowledge and information synchronization is vital to battlespace environmental exploitation, placing the warfighter and all of those who support him on the "same sheet of music" and at a collective advantage, in terms of the current and predicted states of the ocean and atmosphere.</p> <p>Accomplishments and plans described below are examples for each effort category.</p> <p>FY 2023 Plans:</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603207N / <i>Air/Ocean Tactical Applications</i>	Project (Number/Name) 3405 / <i>Decision Support Products & Dissemination</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO
<p>-Continue development of modeling and simulation capabilities for maritime targeting into BUILDER's Target Acquisition Weather Software (TAWS) replacement feature, mitigating a gap in capability created by TAWS reaching program end-of-life.</p> <p>-Continue to operationally evaluate and integrate automated mission environmental forecast briefings for unmanned aircraft. Specific projects will address large unmanned aircraft and will develop the capability to rapidly generate NATOPS compliant flight weather briefs.</p> <p>-Continue development of enhanced visualization of meteorology and oceanography products for improved support to multiple mission areas.</p> <p>-Continue development of data compression and reduced-bandwidth transmission techniques to enable timely receipt of relevant environmental assessment and prediction data to forward platforms in strict communications environments.</p> <p>FY 2024 Base Plans:</p> <p>- Continue development of modeling and simulation capabilities for maritime targeting into BUILDER's Target Acquisition Weather Software (TAWS) replacement features, with increasing focus on next generation software integration, maturation, and verification/validation.</p> <p>- Continue to operationally evaluate and integrate automated mission environmental forecast briefings for unmanned aircraft. Specific projects will address large unmanned aircraft and will develop the capability to rapidly generate NATOPS compliant flight weather briefs.</p> <p>- Continue development of enhanced integration/visualization of meteorology and oceanography products for improved support to multiple mission areas.</p> <p>- Continue development of data compression and reduced-bandwidth transmission techniques to enable timely receipt of relevant environmental assessment and prediction data to forward platforms in strict communications environments.</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603207N / <i>Air/Ocean Tactical Applications</i>		Project (Number/Name) 3405 / <i>Decision Support Products & Dissemination</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Initiate improvements of aviation METOC services and integration into aviation decision tools, including integration into the next generation replacement for the Joint Mission Planning System (JMPS). <i>FY 2024 OCO Plans:</i> N/A <i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> There is no significant funding change from FY 2023 to FY 2024.						
Accomplishments/Planned Programs Subtotals		1.120	1.216	1.245	0.000	1.245
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
Acquisition, management and contracting strategies are to support the Decision Support Products & Dissemination Project to develop, demonstrate and validate products and decision aids to provide environmentally based recommendations to commanders at the Strategic, Operational, and Tactical levels of military operations.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications						Project (Number/Name) 3405 / Decision Support Products & Dissemination			
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Tactical Environmental Support	WR	NRL : Washington DC	1.087	0.300	Nov 2021	0.340	Nov 2022	0.365	Nov 2023	-		0.365	0.000	2.092	-
METOC Tactical Environmental Support	WR	NRL : Monterey, CA; Dtennis Space Center, MS	0.868	0.400	Nov 2021	0.413	Nov 2022	0.420	Nov 2023	-		0.420	Continuing	Continuing	Continuing
METOC Tactical Environmental Support	C/FFP	Various : Various	1.590	0.420	Nov 2021	0.463	Nov 2022	0.460	Nov 2023	-		0.460	0.000	2.933	-
Subtotal			3.545	1.120		1.216		1.245		-		1.245	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			3.545	1.120		1.216		1.245		-		1.245	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy									Date: March 2023							
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications				Project (Number/Name) 3405 / Decision Support Products & Dissemination							
METOC Decisions and Dissemination - assessments					FY 2022				FY 2023				FY 2024			
					1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Numerical predictions skill assessments																
					Global Ocean Multi-Model Comparison											
					Ocean model performance indicators											

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy					Date: March 2023							
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications				Project (Number/Name) 3405 / Decision Support Products & Dissemination			
METOC Decisions and Dissemination - targeted and tactical scales	FY 2022				FY 2023				FY 2024			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Forward-based ocean and ocean acoustics modeling and data assimilation												
	Adaptive Air ASW Planning and Evaluation Tool											
Numerical prediction in support of Navy Resource protection					ship routing and base preparedness algorithms							
Numerical prediction in support of EM warfare and spectrum operations												
	Environmental Performance Surfaces											
									Environmental Performance Surfaces			

2024OSD - 0603207N - 3405

2024OSD - 0603207N - 3405

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603207N / Air/Ocean Tactical Applications

Project (Number/Name)

3405 / Decision Support Products & Dissemination

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>METOC Decisions and Dissemination - assessments</i>				
Numerical predictions skill assessments: Global Ocean Multi-Model Comparison -- NRL-SSC	1	2022	4	2024
Numerical predictions skill assessments: Ocean model performance indicators for operational Navy ocean and acoustic model assessment -- NRL-SSC	1	2022	4	2024
<i>METOC Decisions and Dissemination - targeted and tactical scales</i>				
Forward-based ocean and ocean acoustics modeling and data assimilation: Adaptive Air ASW Planning and Evaluation Tool	1	2022	4	2024
Forward-based ocean and ocean acoustics modeling and data assimilation: Numerical prediction in support of Navy Resource protection: ADVANCED ship routing and base preparedness algorithms	1	2023	4	2026
Numerical prediction in support of EM warfare and spectrum operations: Environmental Performance Surfaces for OTH Radars and HF Communications (AKA, Pearman OTH RADAR Exploitation) -- NRL-SSC	1	2022	4	2024
Numerical prediction in support of EM warfare and spectrum operations: Improve aviation METOC services and integration into aviation decision tools, including integration to for replacement JMPS.	1	2024	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603207N / <i>Air/Ocean Tactical Applications</i>				Project (Number/Name) 9999 / <i>Congressional Adds</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	0.000	0.000	21.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	21.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification
 Conduct research in infrared optimized telescope and maritime unattended sensors.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023
Congressional Add: Infrared optimized telescope	0.000	3.000
FY 2022 Accomplishments: N/A		
FY 2023 Plans: Conduct research in infrared optimized telescope.		
Congressional Add: Maritime unattended sensors	0.000	18.000
FY 2022 Accomplishments: N/A		
FY 2023 Plans: Conduct research in maritime unattended sensors.		
Congressional Adds Subtotals	0.000	21.000

C. Other Program Funding Summary (\$ in Millions)
 N/A

Remarks

D. Acquisition Strategy
 N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications						Project (Number/Name) 9999 / Congressional Adds			
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Need Item Text	C/BA	Not Specified : Not Specified	0.000	0.000		21.000	Jul 2023	0.000		-		0.000	0.000	21.000	-
Subtotal			0.000	0.000		21.000		0.000		-		0.000	0.000	21.000	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		21.000		0.000		-		0.000	0.000	21.000	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy												Date: March 2023							
Appropriation/Budget Activity 1319 / 4								R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications								Project (Number/Name) 9999 / Congressional Adds			

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 9999																												
Environmental and Tropical																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603207N / Air/Ocean Tactical Applications	Project (Number/Name) 9999 / Congressional Adds

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
Environmental and Tropical	4	2024	3	2025

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	PE 0603216N / Aviation Survivability											
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	226.398	24.286	17.387	20.874	-	20.874	23.257	25.634	27.892	28.211	Continuing	Continuing
0584: <i>Acft Protective Clothing</i>	118.841	5.806	7.842	11.631	-	11.631	13.835	16.048	18.161	18.262	Continuing	Continuing
0591: <i>Acft Survivability, Vulnerability & Safety</i>	52.241	5.265	3.528	3.642	-	3.642	3.683	3.712	3.739	3.828	Continuing	Continuing
0592: <i>Acft & Ordnance Safety</i>	49.343	4.908	5.387	4.974	-	4.974	5.097	5.201	5.308	5.424	Continuing	Continuing
1819: <i>CV Acft Fire Suppress System</i>	5.973	0.584	0.630	0.627	-	0.627	0.642	0.673	0.684	0.697	Continuing	Continuing
9999: <i>Congressional Adds</i>	0.000	7.723	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.723

A. Mission Description and Budget Item Justification

Aviation Survivability addresses the issues of aircrew and platform survivability, focusing on enhancing overall opportunity for aircrew and platform protection and enhanced performance. The capabilities addressed under this program element counter emerging threats of next generation operational weapons systems and enhance combat effectiveness in future operational mission scenarios.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	24.815	17.434	19.054	-	19.054
Current President's Budget	24.286	17.387	20.874	-	20.874
Total Adjustments	-0.529	-0.047	1.820	-	1.820
• Congressional General Reductions	-	-0.047			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.529	0.000			
• Program Adjustments	0.000	0.000	1.654	-	1.654
• Rate/Misc Adjustments	0.000	0.000	0.166	-	0.166

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023	
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0603216N I Aviation Survivability	
Congressional Add Details (\$ in Millions, and Includes General Reductions)		FY 2022	FY 2023
Project: 9999: Congressional Adds			
Congressional Add: Context-based augmented reality identification framework		7.723	0.000
Congressional Add Subtotals for Project: 9999		7.723	0.000
Congressional Add Totals for all Projects		7.723	0.000
Change Summary Explanation			
\$1.820M increase from PB23 includes increases for Air Wing of the Future workstations and aircrew hearing damage research as well as other miscellaneous program adjustments.			
Schedule 0584: Ejection/Spine Pain Modeling is extended from 3rd QTR FY22 to 4th QTR FY28 to assess critical research projects in the areas of neck/back pain protection.			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability				Project (Number/Name) 0584 / Acft Protective Clothing			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0584: Acft Protective Clothing	118.841	5.806	7.842	11.631	-	11.631	13.835	16.048	18.161	18.262	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 0584 develops, demonstrates, prototypes, and validates technologies designed to enhance warfighter performance, protection, injury prevention, mission effectiveness, sustainment, and survivability. The project addresses readiness, life support equipment, physiological episodes, hearing protection and communication intelligibility, day / night digital advanced helmet vision systems, laser eye protection and supporting technologies, escape and crashworthy systems, active/passive restraint systems; survival and evasion, aircrew/injury modeling, crew centered cockpit design control stations, and aircraft maintainer protection. Fully protected and mission ready Aircrew are a critical component of Ready Basic Aircraft and mission execution. The goal is to ensure they are able to perform their mission effectively on time, safely, every time. Project 0584 responds to a number of operational requirements documents, including OR# 210-05-88 for Chemical and Biological protection, OR# 099-05-087 for Laser Eye Protection, Aircrew Laser Eye Protection (ALEP) joint operation requirements document JORD #513-88-99, and Capabilities Program Document (CPD) Night Vision Cueing and Display (NVCD).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Advanced Technology Crew Station	5.806	7.842	11.631	0.000	11.631
Articles:	-	-	-	-	-
FY 2023 Plans: Continue to refine the subsystems and components of the baseline Physiological Monitor. Mature the warning elements of the Physiological Monitor Holistic Modular Aircrew Physiologic Status (HMAPS) monitoring system and algorithms, to include warning and the capability to enact steps to mitigate physiologic episodes in real time. Refine algorithms, reduce the technology gaps in the subsystems/sensor components, and expand monitoring to other episode contributors such as, hydration and cognitive state. Verify and validate performance and refine component and subsystem capability as required.					
Begin integration of "Incapacitation Prediction for Readiness in Expeditionary Domains - an Integrated Computational Tool (I-PREDICT)" into Human System Engineering's (HSE) laboratories test and evaluation (T&E) infrastructure. Incorporate biomedically valid software and algorithms to predict chronic and acute injury to enable improved risk assessment in critical HSE laboratories and allow informed trade-off and accelerated, focused testing to enable effective design of PPE, vehicle interiors, and selection of protective tactics, techniques, and procedures. Move critical laboratory test capabilities from mannequin to a cadaver, model based system to improve the design and development of advanced personal protective equipment (PPE - e.g., crashworthy seating, vibration mitigation, helmet mounted displays, night vision devices, oxygen					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability		Project (Number/Name) 0584 / Acft Protective Clothing		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>masks, etc.) to predict and prevent chronic and acute back pain and long-term disabilities. Expand digital human modeling to be able to assess head, neck, spine vertebral alignment/position for the design of PPE and seating systems. Continue the development and testing of active vibration damping and restraint systems. Ensure adaptive damping systems address the full anthropometric range of male/female aviators to reduce the excessive impact and vibration causing debilitating neck/spine injuries while withstanding the harsh environments found on military platforms. Continue assessing other Basic and Applied Research PPE and mission endurance developmental efforts to prepare the most mature / promising for transition to programs of record.</p> <p>Investigate motion blur when using digital high resolution sensor and display technologies in the High Resolution Digital Goggle (HRDG). Determine the minimum acceptable /achievable refresh / frame rates to prevent blurring. Address improvements and preprogrammed upgrades of wavelength band/sensitivity for the silicon wafer to include Short Wavelength InfraRed (SWIR). SWIR is expected to improve resolution at extremely low light levels and in degraded visual environments. Develop and test a wide field of view (WFOV) HRDG goggle (68+ degs).</p> <p>Transition and continue spiral improvements to an aircraft/aircrew-mounted device to detect and alert the warfighter when targeted/irradiated by a laser. Record characteristics (e.g., wavelength, power, pulse duration, etc.) of the laser strike, as well as capture a picture of the scene with the global positioning system (GPS) location.</p> <p>Continue to refine and evaluate on-shore vapor deposition dielectric coatings to provide higher optical densities in the long wavelength visible and near infrared portion of the electromagnetic spectrum. Improve lamination and profiling of dielectric filters. Assess dielectric deposition profile (square vs. sinusoidal), uniformity, and thickness with a goal of increasing optical density. Continue to advance vapor deposition as the preferred approach. Continue advanced research and technology maturation activity for hearing protection, speech intelligibility improvement, active noise reduction (ANR), and dosimetry with emphasis on deep insert earplug technology transfer.</p> <p>Initiate and sign a Memorandum of Agreement (MOA) with the Naval Medical Research Unit - Dayton (NAMRU-D) Ohio. Identify critical research projects in the areas of neck and back pain, spatial disorientation, laser eye protection, and hearing protection. Ensure the research is coordinated and aligns with ongoing Human Systems Engineering research efforts.</p> <p>FY 2024 Base Plans:</p>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability		Project (Number/Name) 0584 / Acft Protective Clothing		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Continue integration of I-PREDICT (Incapacitation Prediction for Readiness in Expeditionary Domains - an Integrated Computational Tool) software/algorithms and digital twin into Human System Engineering's (HSE) laboratories test and evaluation (T&E) infrastructure. Incorporate biomedically based models to enable improved risk assessment and testing to allow informed trade-offs. Move critical laboratory test capabilities from mannequin to a cadaver based model to improve the design, development, and testing of advanced personal protective equipment (PPE - e.g., crashworthy seating, vibration mitigation, helmet mounted displays, night vision devices, oxygen masks, etc.). Expand digital human modeling to assess head, neck, spine vertebral alignment/position for the design of PPE and seating systems. Continue the development and testing of active vibration damping and restraint systems that will address the full anthropometric range of male/female aviators to reduce the excessive impact and vibration while withstanding the harsh environments found on military platforms.						
Continue to advance extended mission effectiveness/endurance through platform improvements of seating systems to reduce the incidence of chronic and acute back and neck pain/injury. Improve seating systems, flight posture, and seat/cockpit ergonomics. Reduce Helmet Mounted Display (HMD) weight, bulk, and vibration.						
Complete assessment digital high resolution sensor and display technologies motion blur. Determine the minimum acceptable /achievable refresh / frame rates to prevent blurring. Address improvements and preprogrammed upgrades of wavelength band/sensitivity for the silicon wafer to include Short Wavelength InfraRed (SWIR) to improve resolution at extremely low light levels and in degraded visual environments. Develop and test a wide field of view (WFOV) High Resolution Digital Goggle (HRDG) goggle (68+ degs). Assess the possibility of using wave guide optics to greatly simplify the optical train for helmet mounted displays.						
Mature prototypes of Active Noise Reduction (ANR), Dosimetry, Digital Signal Processing and related hearing protection and speech intelligibility technologies. Protect aircrew hearing while simultaneously providing effective protection, noise exposure level, intelligibility of voice and audio communication.						
Transition and continue spiral improvements to an aircraft/aircrew-mounted laser event recorder to detect and alert the warfighter when targeted/irradiated by a laser. Record characteristics of the laser strike (e.g., wavelength, power, pulse duration, etc.), as well as capture a picture of the scene with the global positioning system (GPS) coordinates.						
Continue to refine and evaluate dielectric coatings to provide higher optical densities in the long wavelength visible and near infrared portion of the electromagnetic spectrum. Improve lamination and profiling of dielectric						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability		Project (Number/Name) 0584 / Acft Protective Clothing	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>filters. Assess dielectric deposition profile, uniformity, and thickness with a goal of increasing optical density. Continue advanced research and technology maturation activity for hearing protection, speech intelligibility improvement, active noise reduction (ANR), and dosimetry with emphasis on deep insert earplug technology transfer.</p> <p>Complete the baseline Physiological Monitor. Mature the warning elements and blue tooth hub of the Holistic Modular Aircrew Physiologic Status (HMAPS) monitoring system to mitigate physiologic episodes in real time. Refine algorithms, subsystems/sensor components, and expand monitoring to other episode contributors such as, hydration and cognitive state. Verify and validate performance and refine component and subsystem capability as required.</p> <p>Begin Human Systems Integration to address Air Wing of the Future (AWOTF). Optimize work/crew station design to maximize cognitive performance/decision making to support integrated manned and unmanned teaming (MUM-T) Air Wing of the Future. Research will address human performance as a function of cognitive workload and decision support to optimize situational awareness to deliver integrated warfighting capabilities. Continue a coordinated effort with the Naval Medical Research Unit - Dayton (NAMRU-D) Ohio to assess critical research projects in the areas of hypoxia, anthropometry, neck/back pain, laser eye protection, and hearing protection. Ensure the research is coordinated and aligns with ongoing Human Systems Engineering research efforts.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The increase from FY23 to FY24 is for Biomedically Based T&E, Digital Night Vision Tech Maturation, Laser Event Recorder, Aircrew ANR & Dosimetry, and Air Wing of the Future workstations.</p>					
Accomplishments/Planned Programs Subtotals	5.806	7.842	11.631	0.000	11.631

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPN 4268: Aviation Support Equipment	62.496	82.118	82.115	-	82.115	113.003	133.709	140.261	131.545	Continuing	Continuing

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability	Project (Number/Name) 0584 / Acft Protective Clothing

D. Acquisition Strategy

Primary Hardware Development for the Navy Advanced Technology Crew Station efforts will be performed under a Cost Plus Fixed Fee (CPFF) Indefinite Delivery Indefinite Quantity contract (ID/IQ).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability				Project (Number/Name) 0584 / Acft Protective Clothing					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCAD : Pax River MD	37.539	0.616	Oct 2021	0.802	Oct 2022	2.232	Oct 2023	-		2.232	Continuing	Continuing	Continuing
Primary Hardware Development	C/CPFF	Intevac : San Jose CA	9.341	1.470	Dec 2021	1.000	Dec 2022	1.200	Dec 2023	-		1.200	0.000	13.011	13.011
Primary Hardware Development	MIPR	US Army CERDEC : Ft. Belvoir VA	3.640	0.087	Dec 2021	0.000		0.356	Dec 2023	-		0.356	0.000	4.083	4.083
Primary Hardware Development	C/CPFF	Innovital : Calverton MD	0.933	0.000		0.000		0.133	Dec 2023	-		0.133	0.000	1.066	1.066
Physiological Monitoring	C/CPFF	TBD : TBD	2.230	0.510	Dec 2021	0.870	Nov 2022	0.000		-		0.000	0.000	3.610	3.610
I-PREDICT	C/CPFF	TBD : TBD	1.000	1.500	Dec 2021	2.000	Nov 2022	2.000	Dec 2023	-		2.000	0.000	6.500	6.500
Laser Eye Protection	C/CPFF	TBD : TBD	0.350	0.089	Dec 2021	0.500	Nov 2022	0.600	Dec 2023	-		0.600	0.000	1.539	1.539
Prior Year Prod Dev no Longer Funded in Budget Year or Outyears	Various	Various : Various	23.380	0.000		0.000		0.000		-		0.000	0.000	23.380	23.380
Enhanced Visual	C/CPFF	SA Photonics, LLC : TBD	0.700	0.000		0.000		1.000	Dec 2023	-		1.000	0.000	1.700	1.700
Research & Development	MIPR	NAMRUD : Dayton, Oh	0.000	0.000		0.300	Oct 2022	0.900	Oct 2023	-		0.900	0.000	1.200	1.200
Subtotal			79.113	4.272		5.472		8.421		-		8.421	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Configuration Management	WR	NAWCAD : Pax River MD	4.641	0.511	Oct 2021	0.975	Oct 2022	1.340	Oct 2023	-		1.340	Continuing	Continuing	Continuing
Prior Year Support no Longer Funded in Budget Year or Outyears	Various	Various : Various	3.232	0.000		0.000		0.000		-		0.000	0.000	3.232	3.232
Subtotal			7.873	0.511		0.975		1.340		-		1.340	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability				Project (Number/Name) 0584 / Acft Protective Clothing					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NAWCAD : Pax River MD	7.804	0.698	Oct 2021	0.945	Oct 2022	1.300	Oct 2023	-		1.300	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	Various	Various : Various	18.240	0.000		0.000		0.000		-		0.000	0.000	18.240	18.240
Subtotal			26.044	0.698		0.945		1.300		-		1.300	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Pax River MD	5.270	0.320	Oct 2021	0.440	Oct 2022	0.560	Oct 2023	-		0.560	Continuing	Continuing	Continuing
Travel	PO	NAVAIR : Pax River MD	0.541	0.005	Oct 2021	0.010	Oct 2022	0.010	Oct 2023	-		0.010	Continuing	Continuing	Continuing
Need Item Text	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Subtotal			5.811	0.325		0.450		0.570		-		0.570	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			118.841	5.806		7.842		11.631		-		11.631	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy										Date: March 2023																		
Appropriation/Budget Activity										R-1 Program Element (Number/Name)								Project (Number/Name)										
1319 / 4										PE 0603216N / Aviation Survivability								0584 / Acft Protective Clothing										
Acft Protective Clothing	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
	Physiologic Monitoring																											
	Digital Human Modeling																											
	Dielectric Stack Technology																											
	Dye Doped Substrates																											
	Advanced Test Methodologies																											
					Holistic Modular Aircrew Physiologic Status (HMAPS)																							
	Advanced Technology Crew Station																											
								Laser Event Recorder (LER)																				
Digital Sensor Technologies																												
Digital Display Technologies																												
Ejection / Spine Pain Modeling																												
Energy Absorbing Seats																												
Vision Standards				Incapacitation Prediction for Readiness in Expeditionary Domains - an Integrated Computational Tool																								
				Aeromedical Research & Development, NAMRU-D																								

2024DON - 0603216N - 0584

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / <i>Aviation Survivability</i>	Project (Number/Name) 0584 / <i>Acft Protective Clothing</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Acft Protective Clothing</i>				
Physiologic Monitoring	1	2022	4	2028
Digital Human Modeling	1	2022	4	2028
Dielectric Stack Technology	1	2022	4	2028
Dye Doped Substrates	1	2022	4	2023
Advanced Test Methodologies	1	2022	4	2028
Holistic Modular Aircrew Physiologic Status (HMAPS)	1	2023	4	2023
Advanced Technology Crew Station: Laser Event Recorder (LER)	1	2023	1	2027
Advanced Technology Crew Station: Digital Sensor Technologies	1	2022	4	2028
Advanced Technology Crew Station: Digital Display Technologies	1	2022	4	2028
Advanced Technology Crew Station: Ejection / Spine Pain Modeling	1	2022	4	2028
Advanced Technology Crew Station: Energy Absorbing Seats	1	2022	4	2022
Advanced Technology Crew Station: Vision Standards	1	2022	4	2022
Advanced Technology Crew Station: Incapacitation Prediction for Readiness in Expeditionary Domains - an Integrated Computational Tool (I-PREDICT)	1	2023	4	2028
Advanced Technology Crew Station: Aeromedical Research & Development, NAMRU-D	1	2023	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability				Project (Number/Name) 0591 / Acft Survivability, Vulnerability & Safety			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0591: Acft Survivability, Vulnerability & Safety	52.241	5.265	3.528	3.642	-	3.642	3.683	3.712	3.739	3.828	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Aircraft Survivability, Vulnerability and Safety. This project evaluates and develops prototype hardware and software solutions to improve the survivability of Navy and Marine Corps aircraft. This project addresses the likelihood of an aircraft being hit (susceptibility) and the probability of a kill if the aircraft is hit (vulnerability). Types of programs funded under this project include signature reduction efforts, subsystem and component hardening and development of integrated Aviation Survivability Equipment (iASE) architectures for simulation and training systems. This project also provides an engineering level modeling and simulation capability to assess electronic warfare capabilities and to support future electronic warfare investment strategies. Further, this effort expands upon existing high fidelity Hardware In The Loop (HITL) capability and this expanded capability will enable the assessment of Electronic Warfare (EW) concepts versus future (i.e. not fully defined) threat systems. This project will include the development of new or modification of existing modules which are high fidelity representations of the EW and threat system's components and will support iASE hardware and software research and future technological survivability concepts as they become available.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Technology Requirements	0.045	0.045	0.045	0.000	0.045
Articles:	-	-	-	-	-
FY 2023 Plans: Continue to update and expand threats assessments to include new and/or evolved threats. Update modeling and simulation capabilities to better reflect the evolving threat environment.					
FY 2024 Base Plans: Continue to update and expand threats assessments to include new and/or evolved threats. Update modeling and simulation capabilities to better reflect the evolving threat environment.					
FY 2024 OCO Plans: N/A					
Title: Technology Design & Development	3.215	3.301	3.532	0.000	3.532
Articles:	-	-	-	-	-
FY 2023 Plans: The Advanced Electronic Warfare (ADVEW) effort expands upon existing high fidelity Hardware-in-the-Loop capability. This expanded capability will enable the assessment of EW concepts versus future (i.e. not fully					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability	Project (Number/Name) 0591 / Acft Survivability, Vulnerability & Safety			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
defined) threat systems. The effort will include the development of new or modification of existing Modelling & Simulation (M&S) modules which are high fidelity representations of the EW and threat system's components. The effort will ultimately enable a continuum that enables development of new systems from requirements definition, to development and continual assessments, which support the Model Based Systems Engineering approach.						
FY 2024 Base Plans: The Advanced Electronic Warfare (ADVEW) effort expands upon existing high fidelity Hardware-in-the-Loop capability. This expanded capability will enable the assessment of EW concepts versus future (i.e. not fully defined) threat systems. The effort will include the development of new or modification of existing Modelling & Simulation (M&S) modules, and will incorporate products from the Benchmark threat model library, which are high fidelity representations of the EW and threat system's components. Benchmark operates at the dwell-to-dwell level and carries its pedigree through decades of development of high-precision radar tracking algorithms developed under the Missile Defense Agency (MDA). These highly advanced algorithms form the basis for a threat radars receive chain, a critical component not found in existing open-loop stimulation systems and other modeling tools. The effort will ultimately enable a continuum that enables development of new systems from requirements definition, to development and continual assessments, which support the Model Based Systems Engineering approach.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$0.231M due to addition of Benchmark products to ADVEW simulation modules.						
Title: Technology Test & Evaluation		2.005	0.182	0.065	0.000	0.065
Articles:		-	-	-	-	-
FY 2023 Plans: Continue prototype hardware testing in support of the iASE architecture development and in support of Common Carriage countermeasures simulation hardware. Continue testing combat situational awareness capability in a simulated environment. Test newly developed or modified modules to validate accuracy of representations of the EW and threat system's components. Address test anomalies identified during MOB HUB integration test events completed in FY22.						
FY 2024 Base Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability		Project (Number/Name) 0591 / Acft Survivability, Vulnerability & Safety		
<u>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</u>						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Continue prototype hardware testing in support of ASE architecture development and in support of countermeasures simulation hardware. Test newly developed or modified modules to validate accuracy of representations of the EW and threat systems components.						
<i>FY 2024 OCO Plans:</i> N/A						
<i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Decrease of \$0.117M is due to the MobHUB testing and anomaly evaluation that is scheduled to be completed in FY23.						
Accomplishments/Planned Programs Subtotals		5.265	3.528	3.642	0.000	3.642
<u>C. Other Program Funding Summary (\$ in Millions)</u> N/A						
<u>Remarks</u>						
<u>D. Acquisition Strategy</u> Primary Hardware Development will be performed under either a Cost Plus Fixed Fee or a Firm Fixed Price contract.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability						Project (Number/Name) 0591 / Acft Survivability, Vulnerability & Safety			

Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCAD : Pax River, MD	13.888	1.191	Oct 2021	1.188	Oct 2022	2.822	Oct 2023	-		2.822	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCWD : China Lake, CA	0.679	0.731	Jan 2022	0.461	Nov 2022	0.055	Mar 2024	-		0.055	Continuing	Continuing	Continuing
Systems Engineering	MIPR	DTIC : Ft. Belvoir, VA	3.311	0.820	Nov 2021	1.200	Nov 2022	0.450	Oct 2023	-		0.450	0.000	5.781	5.781
System Engineering	C/CPFF	TEKLA : Dumfries, VA	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	0.200
System Engineering	WR	NAWCWD : Pt Mugu, CA	0.000	0.060	Jan 2022	0.060	Jan 2023	0.050	Dec 2023	-		0.050	0.000	0.170	0.170
System Engineering	C/CPFF	Mantech : Fairfax, VA	0.000	0.300	Jan 2022	0.000		0.000		-		0.000	0.000	0.300	0.300
System Engineering	WR	NSWC : Crane, IN	0.000	0.095	Jan 2022	0.095	Jan 2023	0.050	May 2024	-		0.050	0.000	0.240	0.240
Prior Year Prod Dev cost no longer funded in FYDP	Various	Various : Various	21.268	0.000		0.000		0.000		-		0.000	0.000	21.268	21.268
System Engineering	MIPR	AFRL : Eglin AFB, FL	0.000	0.000		0.250	Jan 2023	0.000		-		0.000	0.000	0.250	0.250
System Engineering	C/CPFF	SURVICE : Belcamp, MD	0.000	0.000		0.000		0.100	Jan 2024	-		0.100	0.000	0.100	0.100
Subtotal			39.346	3.197		3.254		3.527		-		3.527	Continuing	Continuing	N/A

Remarks

All prior year lines have been consolidated

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Support cost no longer funded in FYDP	Various	Various : Various	4.569	0.000		0.000		0.000		-		0.000	0.000	4.569	4.569
Subtotal			4.569	0.000		0.000		0.000		-		0.000	0.000	4.569	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability				Project (Number/Name) 0591 / Acft Survivability, Vulnerability & Safety					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NAWCAD : Patuxent River, MD	2.603	0.000		0.000		0.070	Feb 2024	-		0.070	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NAWCWD : China Lake, CA	0.050	2.023	Oct 2021	0.229	Oct 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	C/CPFF	GTRI : Atlanta, GA	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	0.100
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	Various	Various : Various	2.995	0.000		0.000		0.000		-		0.000	0.000	2.995	2.995
Subtotal			5.748	2.023		0.229		0.070		-		0.070	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Pax River, MD	1.853	0.045	Oct 2021	0.045	Oct 2022	0.045	Oct 2023	-		0.045	Continuing	Continuing	Continuing
Prior Year Mgmt cost no longer funded in FYDP	Various	Various : Various	0.725	0.000		0.000		0.000		-		0.000	0.000	0.725	0.725
Subtotal			2.578	0.045		0.045		0.045		-		0.045	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			52.241	5.265		3.528		3.642		-		3.642	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy												Date: March 2023																
Appropriation/Budget Activity 1319 / 4												R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability								Project (Number/Name) 0591 / Acft Survivability, Vulnerability & Safety								
Acft Survivability, Vulnerability & Safety	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Technology Des/Development																												
	Future Vertical Lift Trade-Offs																											
	Miniaturized Self Defense Missile System																											
	EW Enhancements																											
Technology Test & Evaluation																												
	Test & Evaluation of Miniaturized Self Defense Missile System																											
	Advanced Electronic Warfare (ADVEW)																											
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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability	Project (Number/Name) 0591 / Acft Survivability, Vulnerability & Safety

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Acft Survivability, Vulnerability & Safety				
Technology Des/Development: Future Vertical Lift Trade-Offs	1	2022	4	2028
Technology Des/Development: Miniaturized Self Defense Missile System	1	2022	4	2027
Technology Des/Development: EW Enhancements	1	2022	4	2028
Technology Test & Evaluation: Test & Evaluation of Miniaturized Self Defense Missile System	1	2023	4	2027
Technology Test & Evaluation: Advanced Electronic Warfare (ADVEW)	1	2023	1	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability				Project (Number/Name) 0592 / Acft & Ordnance Safety			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0592: Acft & Ordnance Safety	49.343	4.908	5.387	4.974	-	4.974	5.097	5.201	5.308	5.424	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Aircraft and Ordnance Safety Program transitions innovative munitions safety technology to Navy and Marine Corps air weapons, to comply with the Chief of Naval Operations direction that all munitions carried aboard Navy ships be insensitive to unplanned stimuli (thermal, impact, and shock events). The Aircraft and Ordnance Safety Program also ensures the safety and protection of personnel, aircraft, ships, and operational facilities, through improved precision targeting, fail-safe ordnance, selective effects munitions and shock/blast force protection technologies.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Insensitive Munitions (IM)	4.908	5.387	4.974	0.000	4.974
Articles:	-	-	-	-	-
<p>FY 2023 Plans:</p> <p>Air-to-Air Demonstration: Exploring technology to mitigate explosive reaction in rocket motors demonstrated by using thermite as means of ignition prior to an explosion during slow cook-off and/or fast cook-off. Documenting more than 30 insensitive munitions tests completed with more than 6 different Sidewinder warhead concepts in support of a potential major missile upgrade. Demonstration of an improved liner system for GP bombs.</p> <p>Improved Air-Launched Weapons: A new cook-off mitigating liner system for bombs will be demonstrated. Development of novel electronic safe and arm devices for loitering munitions. Loitering munitions fulfill an essential needs gap but pose unique fuze design constraints.</p> <p>Advanced Containment/Case/Warhead Material:</p> <p>Shock/Blast Barrier Protection/Modeling and Simulation: Continued development of remote sensing for slow cook-off, which will be advantageous for ships carrying weapons. Generating data to support advancements in predictive capabilities of shock initiation in regard to explosive trains, insensitive munitions threats, and warhead performance.</p> <p>FY 2024 Base Plans:</p> <p>Air-to-Air Demonstration: Exploring technology to mitigate explosive reaction in rocket motors demonstrated by using thermite as means of ignition prior to an explosion during slow heating and/or fast heating.</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability		Project (Number/Name) 0592 / Acft & Ordnance Safety		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Improved Air-Launched Weapons: Development of novel electronic safe and arm devices for loitering munitions. Loitering munitions fulfill an essential needs gap but pose unique fuze design constraints. Assessing fragment impact survivability for the variable fragmentation warhead in a RAM/Sidewinder form factor including design refinement and CTH modeling of the configuration. Documenting results of an improved liner system demonstration for GP bombs.</p> <p>Advanced Containment/Case/Warhead Material: Investigating how an IM compliant payload reacts during fragment impact testing when pyrophoric liners are incorporated into the payload designs. There has been little to no research demonstrated on how pyrophoric materials affect the insensitive munitions performance of systems.</p> <p>Shock/Blast Barrier Protection/Modeling and Simulation: Advancing predictive capabilities and characterizing a Navy explosive of interest for shock initiation. Continued development of remote sensing for slow cook-off, which will be advantageous for ships carrying weapons. Generating data to support advancements in predictive capabilities of shock initiation in regard to explosive trains, insensitive munitions threats, and warhead performance. Evaluating, through energy fluence techniques, the shock mitigation of the Precision-controlled Additively Manufactured (PAM) Fragmentation Technology when exposed to fragment impact conditions.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The budget was decreased from FY23 to FY24 to account for the anticipated successful completion of the Improved Air to Air Missile Demonstration Testing for the Sidewinder Rocket Motor.</p>						
Accomplishments/Planned Programs Subtotals		4.908	5.387	4.974	0.000	4.974
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
All planned programs are accomplished via civilian labor and use of government testing facilities.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability				Project (Number/Name) 0592 / Acft & Ordnance Safety					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCWD : China Lake, CA	49.335	4.908	Oct 2021	5.387	Oct 2022	4.974	Oct 2023	-		4.974	Continuing	Continuing	Continuing
Subtotal			49.335	4.908		5.387		4.974		-		4.974	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Mgmt no longer funded in FYDP	Various	Various : Various	0.008	0.000		0.000		0.000		-		0.000	0.000	0.008	0.008
Subtotal			0.008	0.000		0.000		0.000		-		0.000	0.000	0.008	N/A
			Prior Years	FY 2022	FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals			49.343	4.908	5.387		4.974		-		4.974	Continuing	Continuing	N/A	
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy														Date: March 2023														
Appropriation/Budget Activity 1319 / 4										R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability								Project (Number/Name) 0592 / Acft & Ordnance Safety										
Acft & Ordnance Safety	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
	Improved Air to Air Missile Demonstration Testing: Electromagnetic Compatibility (EMC)																											
	Improved Air to Air Missile Demonstration Testing: Sidewinder Rocket Motor IM DEMO (2)																											
	Improved Air to Air Missile Demonstration Testing: Sidewinder IM Compatible Warhead																											
	Improved Air Launched Weapons: Explosive Fill Evaluation																											
	Improved Air Launched Weapons: Advanced Anti-Radiation Guided missile (AARGM RM)																											
	Improved Air Launched Weapons: AARGM RM IM Evaluation																											
	Improved Air Launched Weapons: Fuze Munitions (FMU)-139 D/B Modeling																											
	Improved Air Launched Weapons: Impulse Motor																											
	Improved Air Launched Weapons: Long Range Anti-Ship Missile (LRASM)																											
	Shock/Blast Barrier Protection Modeling and DEMO: Barriers																											
	Shock/Blast Barrier Protection Modeling and DEMO: Supersonic Range Strike Missile																											
	Shock/Blast Barrier Protection Modeling and DEMO: Warhead Initiation																											
	Shock/Blast Barrier Protection Modeling and DEMO: Warhead Liner																											
	Shock/Blast Barrier Protection Modeling and DEMO: Remote Sensing of SCO Events																											
	Shock/Blast Barrier Protection Modeling and DEMO: Precision controlled additive																											

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																				Date: March 2023														
Appropriation/Budget Activity															R-1 Program Element (Number/Name)										Project (Number/Name)									
1319 / 4															PE 0603216N / Aviation Survivability										0592 / Acft & Ordnance Safety									
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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603216N / Aviation Survivability

Project (Number/Name)

0592 / Acft & Ordnance Safety

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Acft & Ordnance Safety				
Improved Air to Air Missile Demonstration Testing: Electromagnetic Compatibility (EMC)	1	2022	4	2028
Improved Air to Air Missile Demonstration Testing: Sidewinder Rocket Motor IM DEMO (2)	1	2022	2	2023
Improved Air to Air Missile Demonstration Testing: Sidewinder IM Compatible Warhead	1	2022	2	2023
Improved Air Launched Weapons: Explosive Fill Evaluation	1	2022	4	2023
Improved Air Launched Weapons: Advanced Anti-Radiation Guided missile (AARGM RM)	1	2022	4	2028
Improved Air Launched Weapons: AARGM RM IM Evaluation	1	2022	3	2023
Improved Air Launched Weapons: Fuze Munitions (FMU)-139 D/B Modeling	1	2022	1	2023
Improved Air Launched Weapons: Impulse Motor	1	2022	4	2023
Improved Air Launched Weapons: Long Range Anti-Ship Missile (LRASM)	1	2022	3	2024
Shock/Blast Barrier Protection Modeling and DEMO: Barriers	1	2022	4	2028
Shock/Blast Barrier Protection Modeling and DEMO: Supersonic Range Strike Missile	1	2022	4	2027
Shock/Blast Barrier Protection Modeling and DEMO: Warhead Initiation	1	2022	4	2027
Shock/Blast Barrier Protection Modeling and DEMO: Warhead Liner	1	2022	4	2027
Shock/Blast Barrier Protection Modeling and DEMO: Remote Sensing of SCO Events	1	2022	4	2027
Shock/Blast Barrier Protection Modeling and DEMO: Precision controlled additive	1	2022	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability				Project (Number/Name) 1819 / CV Acft Fire Suppress System			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
1819: CV Acft Fire Suppress System	5.973	0.584	0.630	0.627	-	0.627	0.642	0.673	0.684	0.697	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This project develops improved fire-fighting systems and fire protective measures for aircraft-related fires on aircraft carriers, including assessment of fire properties, definition of fire threats, improvements to fire-fighting agents and delivery systems, fire detection and suppression system performance evaluations, and fire-fighter training improvements.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Fire-Fighting Articles: FY 2023 Plans: Continue support for Naval Air Training and Operating Procedures Standardization improvements for aircraft fire prediction and protection. Continue monitoring aqueous film forming foam developments and other clean agents. Continue to monitor new equipment improvements for saws, spreaders, and other improvements to reduce or discontinue the use of Motor Gasoline on ships. Continue evaluations for flash-hood, crash-fire-rescue face shield and firefighter personnel floatation device improvements. Continue to monitor and recommend Electromagnetic Aircraft Launch Systems fire doctrine, Carrier Fixed Wing Aircraft Nuclear hangar bay conflagration management system operations, and unmanned carrier launched airborne surveillance and strike firefighting operations impacts. Continue project looking at firefighter issues related to composites, weapons and fuels and develop procedures to be used aboard ship to rapidly and safely extinguished deep-seated smoldering fires with composite materials. Continue to evaluate training and certification requirements and equipment to bring the ship up to aviation boatswains mate capabilities and readiness for Air Capable Ships, ships that rely on the ships damage control team and limited resources to fight aircraft related fires. Continue improved weapons cooling scenario testing. Continue project looking at options for firefighter equipment storage on Carrier Fixed-Wing Aircraft Nuclear's(CVN)and Landing Helicopter Assault/Dock (LHA/D) ships. FY 2024 Base Plans: Continue support for Naval Air Training and Operating Procedures Standardization improvements for aircraft fire prediction and protection. Continue monitoring aqueous film forming foam developments and other clean agents. Continue to monitor and test new equipment improvements for saws, spreaders, and other improvements to reduce or discontinue the use of Motor Gasoline on ships. Continue evaluations for flash-								0.584	0.630	0.627	0.000	0.627
								-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603216N / <i>Aviation Survivability</i>		Project (Number/Name) 1819 / <i>CV Acft Fire Suppress System</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>hood, crash-fire-rescue face shield and firefighter personnel floatation device improvements. Add the testing of radiant heat testing for proximity firefighting ensembles. Continue to monitor and recommend Electromagnetic Aircraft Launch Systems fire doctrine, Carrier Fixed Wing Aircraft Nuclear hangar bay conflagration management system operations, and unmanned carrier launched airborne surveillance and strike firefighting operations impacts. Continue project looking at firefighting issues related to aircraft composites, weapons and fuels and develop procedures to be used aboard ship to rapidly and safely extinguished deep-seated smoldering fires with composite materials. Add firefighting and rescue operational testing for effective aircraft canopy breaching. Continue to evaluate training and certification requirements and equipment to bring the ship up to aviation boatswains mate capabilities and readiness for Air Capable Ships, ships that rely on the ships damage control team and limited resources to fight aircraft related fires. Continue improved weapons cooling scenario testing. Continue project looking at options for firefighter equipment storage on Carrier Fixed-Wing Aircraft Nuclear (CVN) and Landing Helicopter Assault/Dock (LHA/D) ships.</p> <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> FY24 decrease to fund higher priority requirement changes within the department.</p>						
Accomplishments/Planned Programs Subtotals		0.584	0.630	0.627	0.000	0.627
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
This is a non-ACAT program. Procurement strategy is determined by market survey and cooperative opportunities.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability				Project (Number/Name) 1819 / CV Acft Fire Suppress System					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCWD : China Lake, CA	0.379	0.072	Oct 2021	0.072	Oct 2022	0.077	Oct 2023	-		0.077	Continuing	Continuing	Continuing
Prior Yr Prod Dev no longer funded in the FYDP	Various	Various : Various	0.335	0.000		0.000		0.000		-		0.000	0.000	0.335	0.335
Subtotal			0.714	0.072		0.072		0.077		-		0.077	Continuing	Continuing	N/A
Remarks															
All prior year lines have been consolidated.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	C/CPFF	ICI : Virginia Beach, VA	0.135	0.000		0.000		0.000		-		0.000	0.000	0.135	0.135
Engineering Support	WR	NAWCWD : China Lake, CA	0.948	0.164	Oct 2021	0.181	Oct 2022	0.180	Oct 2023	-		0.180	Continuing	Continuing	Continuing
Engineering Support	C/CPFF	Hughes Associates : Baltimore, MD	0.172	0.010	Nov 2021	0.010	Nov 2022	0.000		-		0.000	0.000	0.192	0.192
Engineering Support	C/CPFF	AVW : Chesapeake, VA	0.149	0.000		0.000		0.000		-		0.000	0.000	0.149	0.149
Engineering Support	WR	NRL : Washington, DC	0.049	0.010	May 2022	0.010	May 2023	0.010	May 2024	-		0.010	Continuing	Continuing	Continuing
Subtotal			1.453	0.184		0.201		0.190		-		0.190	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NAWCWD : China Lake, CA	2.237	0.208	Oct 2021	0.237	Oct 2022	0.220	Oct 2023	-		0.220	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	C/FFP	Hughes Associates : Baltimore, MD	0.718	0.060	Nov 2021	0.060	Nov 2022	0.080	Nov 2023	-		0.080	0.000	0.918	0.918

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability				Project (Number/Name) 1819 / CV Acft Fire Suppress System					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	Various	Various : Various	0.329	0.000		0.000		0.000		-		0.000	0.000	0.329	0.329
Subtotal			3.284	0.268		0.297		0.300		-		0.300	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	WR	NAWCWD : China Lake, CA	0.522	0.060	Oct 2021	0.060	Oct 2022	0.060	Oct 2023	-		0.060	Continuing	Continuing	Continuing
Subtotal			0.522	0.060		0.060		0.060		-		0.060	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			5.973	0.584		0.630		0.627		-		0.627	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0603216N / Aviation Survivability

Project (Number/Name)
1819 / CV Acft Fire Suppress System

CV Acft Fire Suppress System	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Product Development-Systems Engineering																												
	Monitor Systems (Aqueous Film Forming Foam, Cleaning Agents, EMALS, etc.)																											
Engineering Support																												
	Firefighting NATOPS																											
	ACS Aviation Firefighting Readiness																											
Test & Evaluation																												
	Aircraft Rescue Systems																											
	Aircraft Firefighting PPE																											
	Firefighting Hazards (Composite)																											
	Weapons Cooling																											

2024DON - 0603216N - 1819

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / <i>Aviation Survivability</i>	Project (Number/Name) 1819 / <i>CV Acft Fire Suppress System</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>CV Acft Fire Suppress System</i>				
Product Development-Systems Engineering: Monitor Systems (Aqueous Film Forming Foam, Cleaning Agents, Electro Magnetic Aircraft Launch System (EMALS), etc.)	1	2022	4	2028
Engineering Support: Firefighting NATOPS	1	2022	4	2028
Engineering Support: Air Capable Ship (ACS) Aviation Firefighting Readiness	1	2022	4	2028
Test & Evaluation: Aircraft Rescue Systems	1	2022	4	2028
Test & Evaluation: Aircraft Firefighting Personal Protective Equipment (PPE)	1	2022	2	2028
Test & Evaluation: Firefighting Hazards (Composite)	1	2022	4	2028
Test & Evaluation: Weapons Cooling	1	2022	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability				Project (Number/Name) 9999 / Congressional Adds			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: Congressional Adds	0.000	7.723	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.723
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification
FY2022 Congressional Add
C747: Context based augmented reality identification framework

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023
Congressional Add: Context-based augmented reality identification framework	7.723	0.000
FY 2022 Accomplishments: Funding will support Congressional Add efforts in context based augmented reality.		
FY 2023 Plans: N/A		
Congressional Adds Subtotals	7.723	0.000

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
FY2022 Congressional Add for 0584 - TBD

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability				Project (Number/Name) 9999 / Congressional Adds					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Congressional Add TBD		TBD	TBD : TBD	0.000	7.723	Sep 2022	0.000		0.000		-	0.000	0.000	7.723	-
Subtotal			0.000	7.723		0.000		0.000		-		0.000	0.000	7.723	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	7.723		0.000		0.000		-		0.000	0.000	7.723	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0603216N / Aviation Survivability

Project (Number/Name)
9999 / Congressional Adds

Proj 9999	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	
Context-based augmented reality identification framework			Development																										
2024OSD - 0603216N - 9999																													

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603216N / Aviation Survivability	Project (Number/Name) 9999 / Congressional Adds

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
Context-based augmented reality identification framework: Context-based augmented reality identification framework	3	2022	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603239N I (U)NAVAL CONSTRUCTION FORCES							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	2.251	5.271	1.706	7.821	-	7.821	7.640	4.038	3.408	3.261	Continuing	Continuing
3444: Airfield/Port Damage Repair	2.251	5.271	1.706	7.821	-	7.821	7.640	4.038	3.408	3.261	Continuing	Continuing

A. Mission Description and Budget Item Justification

Project 3444 directly supports Joint Force resiliency in accordance with the National Defense Strategy (NDS) of 2022, A Design for Maintaining Maritime Superiority 2.0, and the NAVFAC Strategic Design 2.0 Guidance. Investment in EABO technologies enables Naval Construction Force (NCF) capability modernization and adaption for Naval Integration. These technologies enable capabilities such as Airfield Damage Repair (ADR), Port Damage Repair (PDR), Expeditionary Ordinance Re-load (ExORD), Expeditionary Fuel Distribution (ExFUEL), and Expeditionary Force Sustainment in a littoral environment. New warfighting concepts and Marine Corps organizational changes will necessitate future changes to NCF capabilities, organization, and table of allowance material. Further, mobile infrastructure capabilities are envisioned to supplement these vulnerable fixed airfield and port infrastructure assets. This program provides for investment in technologies, materials, and process solutions to improve logistics resiliency and enhance Expeditionary Navy performance in the following portfolio areas; ADR, PDR, Expeditionary Engineering Materials and Equipment (EEME), and Advanced Manufacturing (AdvM). The AdvM portfolio area has been aligned under Project 3444 beginning in FY24, complementary efforts previously funded under RDTE,N PE/Project 0204413N/2477.

Investments that facilitate rapid ADR include; saltwater concrete, full-depth reclamation, autonomous airfield inspection and survey, and follow-on RDTE for transition of Joint Capability Technology Demonstration (JCTD) products. Additional investments that facilitate PDR include; mini robotic salvage dredge research, expedient pier assessment and repair, quay wall repair technologies, port assessment sensor integration of survey data for real time operational decisions, and integration of metadata for 3D virtual assessments. Innovative AdvM capabilities will address the operational and logistic deficiencies associated with obtaining repair parts and producing EOD training aids during distributed maritime operations (DMO) along with other predicted readiness and expeditionary operational challenges. The Expeditionary Navy will gain the capability to print parts, material, and structures in austere environments at remote sites with limited external logistical support to augment the existing supply system, and to bridge gaps and shortfalls keeping personnel and equipment actively engaged in mission execution. This effort will develop and assess technologies for Organizational-Level Maintenance (OM) usage; develop and assess modified COTS and GOTS AdvM equipment, techniques, and procedures for Intermediate-Level Maintenance (IM) usage to mitigate logistics gaps during operational events within the Expeditionary Navy. Development includes evaluation and modification of the Expeditionary Fabrication (EXFAB) concept to meet expeditionary warfighter requirements as detailed in the NECE Advanced Manufacturing Analysis of Alternatives.

Development of alternative expeditionary engineering materials and equipment will maximize agility and resiliency while minimizing supply chain risk. These technologies will enable in-the-field production of parts (including original and spare parts for expeditionary equipment) and in-situ fabrication of expeditionary structures. This includes production equipment (such as advanced manufacturing systems), raw materials (such as locally sourced construction materials), inspection and quality certification equipment, as well as support methods and criteria to employ these systems in the expeditionary environment. New concepts for expeditionary engineering equipment technologies enhance expeditionary engineering operations, to include site identification, selection, and planning; site clearing and preparation; construction activities; site operations support (including local material handling, damage repair, etc.); and site deconstruction and retrograde activities. Technologies demonstrated

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0603239N I (U)NAVAL CONSTRUCTION FORCES			
will provide required engineer support capability while maximizing the ability to deploy (by minimizing size and weight) and enhancing operator safety (by providing direct operator protection or allowing for remote or autonomous operation).					
The results of these efforts will enhance Navy force response plans, and Joint Force Commander's flexibility to deploy and employ from expeditionary airfields, as well as deliver and sustain warfighting capabilities at the point of effect. This includes "right size, just-in-time" technologies that can facilitate both conventional and autonomous rapid assessment, repair, and re-constitution of expeditionary airfields. These efforts to develop technologies supporting NCF's PDR capabilities include just-in-time assessment and rapid repair of piers, quay- walls, fleet moorings, critical expeditionary waterfront facilities and infrastructure, and port facilities above, at, and below the waterline to enable the reviving, re-armament, repair, re-fueling, re-calibration and re-constitution of fleet platforms at Sea Ports of Debarkation (SPODs) available during Major Combat Operations (MCO). FYDP effort involves transitioning these capabilities into a program of record within an existing Table of Allowance (TOA) and Supports NDS requirements of Resilient and Agile Logistics and supplements the Navy's ExADR Program of DMO 38-Operational Logistics allowing dynamic operational maneuverability with both fixed and mobile logistics					
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	5.290	1.706	2.465	-	2.465
Current President's Budget	5.271	1.706	7.821	-	7.821
Total Adjustments	-0.019	0.000	5.356	-	5.356
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.019	0.000			
• Program Adjustments	0.000	0.000	5.300	-	5.300
• Rate/Misc Adjustments	0.000	0.000	0.056	-	0.056
Change Summary Explanation					
Increase of \$6.115 million is due to the requirement to mitigate deficiencies identified in the PDR AoA and re-alignment of the advanced manufacturing capability set under project 3444.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603239N / (U)NAVAL CONSTRUCTIO N FORCES				Project (Number/Name) 3444 / Airfield/Port Damage Repair			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3444: Airfield/Port Damage Repair	2.251	5.271	1.706	7.821	-	7.821	7.640	4.038	3.408	3.261	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 3444 directly supports Joint Force resiliency in accordance with the National Defense Strategy (NDS) of 2022, A Design for Maintaining Maritime Superiority 2.0, and the NAVFAC Strategic Design 2.0 Guidance. Investment in EABO technologies enables Naval Construction Force (NCF) capability modernization and adaption for Naval Integration. These technologies enable capabilities such as Airfield Damage Repair (ADR), Port Damage Repair (PDR), Expeditionary Ordinance Re-load (ExORD), Expeditionary Fuel Distribution (ExFUEL), and Expeditionary Force Sustainment in a littoral environment. New warfighting concepts and Marine Corps organizational changes will necessitate future changes to NCF capabilities, organization, and table of allowance material. Further, mobile infrastructure capabilities are envisioned to supplement these vulnerable fixed airfield and port infrastructure assets. This program provides for investment in technologies, materials, and process solutions to improve logistics resiliency and enhance Expeditionary Navy performance in the following portfolio areas; ADR, PDR, Expeditionary Engineering Materials and Equipment (EEME), and Advanced Manufacturing (AdvM). The AdvM portfolio area has been aligned under Project 3444 beginning in FY24, complementary efforts previously funded under RDTE,N PE/Project 0204413N/2477.

Investments that facilitate rapid ADR include; saltwater concrete, full-depth reclamation, autonomous airfield inspection and survey, and follow-on RDTE for transition of Joint Capability Technology Demonstration (JCTD) products. Additional investments that facilitate PDR include; mini robotic salvage dredge research, expedient pier assessment and repair, quay wall repair technologies, port assessment sensor integration of survey data for real time operational decisions, and integration of metadata for 3D virtual assessments. Innovative AdvM capabilities will address the operational and logistic deficiencies associated with obtaining repair parts and producing EOD training aids during distributed maritime operations (DMO) along with other predicted readiness and expeditionary operational challenges. The Expeditionary Navy will gain the capability to print parts, material, and structures in austere environments at remote sites with limited external logistical support to augment the existing supply system, and to bridge gaps and shortfalls keeping personnel and equipment actively engaged in mission execution. This effort will develop and assess technologies for Organizational-Level Maintenance (OM) usage; develop and assess modified COTS and GOTS AdvM equipment, techniques, and procedures for Intermediate-Level Maintenance (IM) usage to mitigate logistics gaps during operational events within the Expeditionary Navy. Development includes evaluation and modification of the Expeditionary Fabrication (EXFAB) concept to meet expeditionary warfighter requirements as detailed in the NECE Advanced Manufacturing Analysis of Alternatives.

Development of alternative expeditionary engineering materials and equipment will maximize agility and resiliency while minimizing supply chain risk. These technologies will enable in-the-field production of parts (including original and spare parts for expeditionary equipment) and in-situ fabrication of expeditionary structures. This includes production equipment (such as advanced manufacturing systems), raw materials (such as locally sourced construction materials), inspection and quality certification equipment, as well as support methods and criteria to employ these systems in the expeditionary environment. New concepts for expeditionary engineering equipment technologies enhance expeditionary engineering operations, to include site identification, selection, and planning; site clearing and preparation; construction activities; site operations support (including local material handling, damage repair, etc.); and site deconstruction and retrograde activities. Technologies demonstrated

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023				
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603239N / (U)NAVAL CONSTRUCTIO N FORCES	Project (Number/Name) 3444 / Airfield/Port Damage Repair				
will provide required engineer support capability while maximizing the ability to deploy (by minimizing size and weight) and enhancing operator safety (by providing direct operator protection or allowing for remote or autonomous operation).							
The results of these efforts will enhance Navy force response plans, and Joint Force Commander's flexibility to deploy and employ from expeditionary airfields, as well as deliver and sustain warfighting capabilities at the point of effect. This includes "right size, just-in-time" technologies that can facilitate both conventional and autonomous rapid assessment, repair, and re-constitution of expeditionary airfields. These efforts to develop technologies supporting NCF's PDR capabilities include just-in-time assessment and rapid repair of piers, quay- walls, fleet moorings, critical expeditionary waterfront facilities and infrastructure, and port facilities above, at, and below the waterline to enable the reviving, re-armament, repair, re- fueling, re-calibration and re-constitution of fleet platforms at Sea Ports of Debarkation (SPODs) available during Major Combat Operations (MCO). FYDP effort involves transitioning these capabilities into a program of record within an existing Table of Allowance (TOA) and Supports NDS requirements of Resilient and Agile Logistics and supplements the Navy's ExADR Program of DMO 38-Operational Logistics allowing dynamic operational maneuverability with both fixed and mobile logistics							
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Airfield Damage Repair (ADR)			1.261	0.252	0.936	0.000	0.936
Articles:			-	-	-	-	-
FY 2023 Plans: Invest in technologies, materials, and process solutions that facilitate rapid airfield damage repair including saltwater concrete, full-depth reclamation, autonomous airfield inspection and survey, along with continued RDTE to transition Joint Capability Technology Demonstration (JCTD) products. - Full-depth Reclamation: Year 2 of 3, effort continues with the integration and validation of commercial roadway pavement reclamation techniques and equipment for military use in the rehabilitation of expeditionary airfields. - AoA Technical Gap: Year 2 of 3, effort continues with the integration and optimization of crater damage repair methods and equipment into capability sets for the Naval Construction Forces Expeditionary Rapid Airfield Damage Repair (NCF ExRADR) table of allowance (TOA) and unified facilities criteria (UFC).							
FY 2024 Base Plans: - Full-depth Reclamation: Year 3 of 3, effort culminates with data consolidation and analysis from the full-scale test section testing. Final full-depth reclamation process criteria is then developed and readied for transition into Tri-service pavements working group supplemental criteria or unified facilities criteria (UFC).							

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023					
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603239N / (U)NAVAL CONSTRUCTIO N FORCES		Project (Number/Name) 3444 / Airfield/Port Damage Repair				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)				FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- AoA Technical Gap: Year 3 of 3, effort culminates with the final transition of crater damage repair methods and equipment into capability sets for the Naval Construction Forces Expeditionary Rapid Airfield Damage Repair (NCF ExRADR) table of allowance (TOA) and unified facilities criteria (UFC).</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$0.684 million will support developing the remaining technologies identified in the AoA which was completed end of FY2021.</p>								
				3.565	1.125	3.647	0.000	3.647
				-	-	-	-	-
<p>Title: Port Damage Repair (PDR)</p> <p>Articles:</p> <p>FY 2023 Plans: Investment in technologies and process solutions that facilitate port damage repair including mini robotic salvage dredge research, expedient pier assessment and repair, quay wall repair technologies, port assessment sensor integration of survey data for real time operational decisions, integration of collected meta data to create 3D virtual assessments.</p> <p>- AoA Technical Gap: Year 3 of 6, effort continues with a solicitation of proposals for the mitigation of identified capability gaps and down selection of proposals informed by operational risk assessments.</p> <p>- Expedient Pier Assessment and Repair: Year 3 of 4, effort continues with full-scale destructive testing of PIER JCTD class IV materials and components to validate working load limits and ability to meet pier side logistics/ seaport-of-debarkation offload requirements.</p> <p>- Quay wall Repair: Year 3 of 3, effort continues with the finalized documentation and transition of recommended quay wall repair equipment and methodologies into the NCF table of allowance and relevant criteria products.</p> <p>- Port Assessment Sensor Integration: Year 2 of 2, effort continues with the demonstration and validation of identified pier/ port survey tools and sensors; culminating in a transition recommendation for the UCT and NCF table of allowance.</p>								

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023					
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603239N I (U)NAVAL CONSTRUCTIO N FORCES		Project (Number/Name) 3444 I Airfield/Port Damage Repair				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)				FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Pillar Training Package & Pier Recon & Assessment Tool (PRAT): Year 1 of 1, effort focuses on providing necessary updates to the PRAT software tool and transitioning the tool for operational use within the NCF.</p> <p>- Expeditionary 3D Virtual Assessments (Scan to Publish): Year 3 of 3, effort culminates with the final documentation and publication of site survey/assessment, tools, processes, and vignettes.</p> <p>FY 2024 Base Plans:</p> <p>- AoA Technical Gap: Year 4 of 6, effort continues with the initiation of selected project proposals. Specific projects include expedient port assessment and analysis tools, e.g. magnetic sensor technology identified to improve the current LIDAR capability which is limited to Level One (superficial) assessments, real-time engineering assessment methodologies that support expeditionary timelines, and additional repair technologies for PDR necessary to meet expedient PDR timeline requirements.</p> <p>- Expedient Construction Barge: Year 1 of 2, effort begins with the identification of modular construction barge platforms/systems, evaluation of alternatives, procurement of prototype platforms, and limited user evaluation of prototype systems in an expeditionary environment.</p> <p>- Aerial Port Assessment System (APAS): Year 1 of 3, effort begins with the identification of relevant commercial technologies to enable rapid autonomous pier condition surveys to assess operational utility of expeditionary and host nation facilities.</p> <p>- PDR Technology Test and Evaluation: Year 1 of 2, effort begins with the development of PDR test and evaluation master plan (TEMP) to include development of Critical Operational Issues (COIs), Measures of Effectiveness (MOEs), Measures of Suitability (MOSSs), and Measures of Performance (MOPs). The TEMP will be used to evaluate capability set alterations, improvements, and progress towards meeting required operational capability (ROC) in the projected operational environment (POE).</p> <p>- Expedient Pier Assessment and Repair: Year 4 of 4, effort continues with additional full-scale destructive testing of PIER JCTD class IV materials and components to validate working load limits and ability to meet pier side logistics/seaport-of-debarkation offload requirements. Logistics support and provisioning of components is also completed and transitioned to the program for ongoing support.</p> <p>FY 2024 OCO Plans:</p>								

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603239N / (U)NAVAL CONSTRUCTIO N FORCES		Project (Number/Name) 3444 / Airfield/Port Damage Repair		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$2.522 million will be used to further define and develop the PDR capability shortfalls defined in the AoA.						
Title: Expeditionary Engineering Materials and Equipment (EEME) Articles: FY 2023 Plans: Investment in materials and equipment that facilitate expeditionary battle damage repair and reduce the logistics burden of Class IV construction materials. - ACES JCTD: Year 3 of 3, effort culminates with the integration of the expeditionary automated construction system into an operational prototype for evaluation at the final military utility assessment event. Program deliverables are finalized and readied for transition to program of record. FY 2024 Base Plans: - Autonomous Construction Equipment: Year 1 of 3, effort begins with the identification of relevant commercial remote/autonomous construction equipment, e.g. excavators, compact track loaders (CTLs), bulldozers, scrapers, graders; evaluation of alternative systems and assessment of technology readiness levels necessary for integration into the ADR and PDR capability sets. Autonomous construction equipment is a potential force multiplier necessary to mitigate current NCF active/reserve component manpower trends. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$0.397 million will support initiation of the Autonomous Construction Equipment research and development.		0.200 -	0.129 -	0.526 -	0.000 -	0.526 -
Title: Expeditionary Advance Base Operations (EABO) Articles: FY 2023 Plans: In support of the NCF Force Re-design, this Program Element provides for continued investment in Expeditionary Navy table of allowance gap identification, prioritization, and mitigation supporting Distributed		0.245 -	0.200 -	0.306 -	0.000 -	0.306 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603239N I (U)NAVAL CONSTRUCTIO N FORCES		Project (Number/Name) 3444 I Airfield/Port Damage Repair		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Maritime Operations (DMO), Expeditionary Advanced Base Operations (EABO), and Littoral Operations in a Contested Environment (LOCE) in multiple GCC AORs. - Solicitation and Selection of Proposals: Year 1 of 1, effort begins with the development of a call for proposals to address identified ADR/PDR/AdvM capability gaps reflected in current NECC SONs and CNs. Effort then concludes with the selection of proposals that best mitigate capability gaps in the near/long-term. FY 2024 Base Plans: Initiate the proposals selected above utilizing organic resources, other DoD labs and facilities, academia, and appropriate commercial resources. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$0.106 million will support the initial development activities for the proposed solutions.						
Title: Advanced Manufacturing (AdvM) Articles:		0.000 -	0.000 -	2.406 -	0.000 -	2.406 -
FY 2023 Plans: N/A FY 2024 Base Plans: This effort will develop and assess technologies for Organizational-Level Maintenance (OM) usage; develop and assess modified COTS and GOTS AdvM equipment, techniques, and procedures for Intermediate-Level Maintenance (IM) usage to mitigate logistics gaps during operational events within the Expeditionary Navy. - AoA O-Level Technical Gap: Year 1 of 5, effort begins with the identification and assessment of relevant commercial technologies for the mitigation of O-Level maintenance capability and training aid production gaps. - AoA I-Level Technical Gap: Year 1 of 5, effort begins with a solicitation of proposals for the mitigation of identified I-Level maintenance capability gaps and down selection of proposals to produce a prototype in Year 2 informed by operational risk assessments. FY 2024 OCO Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603239N / (U)NAVAL CONSTRUCTIO N FORCES		Project (Number/Name) 3444 / Airfield/Port Damage Repair		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
<i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Increase of \$2.406 million will support research to determine employment of new technologies in the expeditionary operational environment with an end goal to reduce operational dependency on supply and logistic systems in austere environments.						
Accomplishments/Planned Programs Subtotals		5.271	1.706	7.821	0.000	7.821
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy The Projects identified in this budget are carefully selected to respond to resiliency considerations of evolving and aging airfields, ports, expeditionary operations, and to facilitate rational risk based decisions and solutions to protect and decrease risk levels for Department of the Navy-critical expeditionary waterfront facilities and infrastructure. The results of these projects will be the development of design and construction criteria and/or components that directly influence Navy-critical expeditionary and waterfront facilities and infrastructure.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603239N / (U)NAVAL CONSTRUCTIO N FORCES						Project (Number/Name) 3444 / Airfield/Port Damage Repair			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Airfield Damage Repair	WR	NAVFAC EXWC : Pt Hueneme, CA	0.240	1.261	Jan 2022	0.252	Dec 2022	0.936	Jan 2024	-		0.936	Continuing	Continuing	Continuing
Port Damage Repair	WR	NAVFAC EXWC : Pt Hueneme, CA	0.681	2.065	Jan 2022	0.330	Dec 2022	2.391	Jan 2024	-		2.391	Continuing	Continuing	Continuing
Port Damage Repair	Various	ERDC : Vicksburg, MS	1.000	1.500	Feb 2022	0.795	Dec 2022	1.256	Jan 2024	-		1.256	Continuing	Continuing	Continuing
Expeditionary Engineering Materials and Equipment	Reqn	NAVFAC EXWC : Pt Hueneme, CA	0.080	0.200	Jan 2022	0.000		0.526	Jan 2024	-		0.526	Continuing	Continuing	Continuing
Expeditionary Engineering Materials and Equipment	Reqn	ERDC : Vicksburg, MS	0.250	0.000		0.129	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing
EABO(Expeditionary Advance Base Operations)	Various	NAVFAC EXWC : Pt Hueneme, CA	0.000	0.245	Jan 2022	0.200	Dec 2022	0.306	Jan 2024	-		0.306	Continuing	Continuing	Continuing
Advanced Manufacturing	Various	NAVFAC EXWC : Pt Hueneme, CA	0.000	0.000		0.000		2.406	Feb 2024	-		2.406	Continuing	Continuing	Continuing
Subtotal			2.251	5.271		1.706		7.821		-		7.821	Continuing	Continuing	N/A
Remarks															
The increase of \$6.115M is a result of the need to mitigate deficiencies identified in the PDR AoA (completed in May 2022) and re-alignment/initiation of the advanced manufacturing capability set under project 3444.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			2.251	5.271		1.706		7.821		-		7.821	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603239N / (U)NAVAL CONSTRUCTIO
N FORCES

Project (Number/Name)

3444 / Airfield/Port Damage Repair

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Airfield Damage Repair Group																												
Rapid Airfield Material Recycling and Rehabilitation (RAMRR)																												
Saltwater Concrete																												
AoA Technical Gap																												
Autonomous Airfield and Port Inspection																												
Port Damage Repair Group																												
AoA Technical Gap																												
MRSD Testing																												
Expedient Pier Assessment and Repair																												
Quaywall Repair																												
Pillar Trng Packg. & Pier Recon & Assesment Tool (PRAT)																												
Aerial Port Assesment System (APAS)																												
Port Assessment Process																												
Expeditionary 3D Virtual Assessments (Scan to Publish)																												
Port Assessment Sensor Integration																												
Expeditionary Engineering Materials and Equipment:																												
ACES JCTD																												
EABO: Test and Evaluation Oversight																												
Advanced Manufacturing																												
Analysis of Alternatives - Organziation Level Maintenance Technical Gap																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																				Date: March 2023								
Appropriation/Budget Activity 1319 / 4										R-1 Program Element (Number/Name) PE 0603239N / (U)NAVAL CONSTRUCTIO N FORCES										Project (Number/Name) 3444 / Airfield/Port Damage Repair								
	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Analysis of Alternatives - Intermediate Level Maintenance Technical Gap																												
Expeditionary Advanced Base Operations																												
Test and Evaluation Oversight																												
Solicitation and Selection of Proposals																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603239N / (U)NAVAL CONSTRUCTIO
N FORCES

Project (Number/Name)

3444 / Airfield/Port Damage Repair

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Airfield Damage Repair Group				
Rapid Airfield Material Recycling and Rehabilitation (RAMRR)	3	2022	2	2025
Saltwater Concrete	2	2022	2	2023
AoA Technical Gap	3	2022	3	2025
Autonomous Airfield and Port Inspection	1	2024	4	2026
Port Damage Repair Group				
AoA Technical Gap	1	2022	1	2026
MRSD Testing	3	2022	2	2023
Expedient Pier Assessment and Repair	3	2022	2	2025
Quaywall Repair	3	2022	2	2025
Pillar Trng Packg. & Pier Recon & Assesment Tool (PRAT)	1	2023	4	2023
Aerial Port Assesment System (APAS)	2	2024	1	2027
Port Assessment Process	1	2024	4	2026
Expeditionary 3D Virtual Assessments (Scan to Publish)	2	2022	1	2024
Port Assessment Sensor Integration	3	2022	2	2023
Expeditionary Engineering Materials and Equipment:				
ACES JCTD	3	2022	1	2023
EABO: Test and Evaluation Oversight	1	2022	4	2026
Advanced Manufacturing				
Analysis of Alternatives - Organziation Level Maintenance Technical Gap	1	2024	1	2028
Analysis of Alternatives - Intermediate Level Maintenance Technical Gap	1	2024	1	2028
Expeditionary Advanced Base Operations				

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603239N / (U)NAVAL CONSTRUCTIO N FORCES	Project (Number/Name) 3444 / Airfield/Port Damage Repair	
		Start		End
Events by Sub Project		Quarter	Year	Quarter Year
Test and Evaluation Oversight		1	2022	1 2026
Solicitation and Selection of Proposals		1	2023	4 2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	PE 0603254N / ASW Systems Development											
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	168.135	20.079	15.977	17.090	-	17.090	20.183	20.518	20.895	21.314	Continuing	Continuing
1292: <i>Adv ASW Sensors & Proc</i>	165.239	17.183	15.977	17.090	-	17.090	20.183	20.518	20.895	21.314	Continuing	Continuing
9999: <i>Congressional Adds</i>	2.896	2.896	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.792

A. Mission Description and Budget Item Justification

Includes RDT&E funds for advanced development and developmental testing of airborne Anti-Submarine Warfare (ASW) systems including aircraft, equipment, and devices for use against all types of submarine targets.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	20.598	15.986	17.021	-	17.021
Current President's Budget	20.079	15.977	17.090	-	17.090
Total Adjustments	-0.519	-0.009	0.069	-	0.069
• Congressional General Reductions	-	-0.009			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.512	0.000			
• Rate/Misc Adjustments	-0.007	0.000	0.069	-	0.069

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 9999: *Congressional Adds*

Congressional Add: *Innovative AWS technologies*

	FY 2022	FY 2023
	2.896	0.000
Congressional Add Subtotals for Project: 9999	2.896	0.000
Congressional Add Totals for all Projects	2.896	0.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603254N / ASW Systems Development	
<p>Change Summary Explanation</p> <p>FY22 -\$0.519M SBIR and cancelled account adjustments FY23 -\$0.009M Congressional General reductions FY24 +\$0.069M Rate/Misc adjustments</p> <p>Schedule: Improved descriptors for Performance Assessment, Algorithm maturation and Software and Experiment/Exercise Participation, to better reflect execution plans. Two additional "over-the-side" demonstrations added to schedule in 3Q/23 and 4Q/23 respectively. Two additional Signal Processing deliverables added to schedule in 1Q/23 and 3Q/23 respectively.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603254N / ASW Systems Development				Project (Number/Name) 1292 / Adv ASW Sensors & Proc			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
1292: Adv ASW Sensors & Proc	165.239	17.183	15.977	17.090	-	17.090	20.183	20.518	20.895	21.314	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program improves Air Anti-Submarine Warfare (ASW) effectiveness through development and maturation of advanced hardware and software associated with airborne acoustic and non-acoustic systems. This includes sensors and components, processing, post-processing, data recording and display capabilities to address near-peer threat scenarios against surfaced or submerged conventionally and nuclear powered submarines. Key objectives include: advancing active and passive sensors and components; improving detection, classification, localization and tracking; and increasing capacity and flexibility to handle multi-sensor data loads. Technology evaluations include sonobuoy communication links to/from aircraft, distributed netted sensors, transient signals, and source and receiver technologies that will enhance passive and multistatic active sensor systems.

Products being funded during the FYDP will provide for the development and maturation of persistent tactical search technologies that will allow transition to the localization and attack phase in operationally relevant environments. In addition, the program will provide for the development and subsequent experimentation, including data collection and engineering measurement, of the next generation of multistatic sources and receivers; passive sensors and processors; and non-acoustic technologies. Matured technologies that increase operational capability will transition to acquisition programs of record for eventual release on ASW platforms. The RDT&E test articles, which consist of sensors, components and associated processing, are employed and expended in support of and during in-water experimentation.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: System performance assessments	17.183	15.977	17.090	0.000	17.090
Articles:	100	90	180	-	180
FY 2023 Plans: Mature the air-deployable vertical line array prototype sensor for UnderSea Advantage by employing the related test articles, models, processors and algorithms in air-deployable demonstrations to validate technical maturity and assess operational performance. Execute test(s) in relevant operational environments, and conduct data analyses to evaluate the prototype hardware and associated algorithms. Conduct performance assessments, gap analyses, and rapid prototyping to demonstrate the next generation of active and passive system components, through advancements in high-gain sensing.					
FY 2024 Base Plans: Employ the UnderSea Advantage prototypes, models, processors and algorithms in relevant demonstrations to validate technical maturity and assess operational performance. Execute test(s) in operational environments, and conduct data analyses to evaluate the prototype hardware and associated algorithms. Progress towards					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy								Date: March 2023				
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603254N / ASW Systems Development				Project (Number/Name) 1292 / Adv ASW Sensors & Proc				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>the acquisition phase by addressing performance assessments, gap analyses, and rapid prototyping of the next generation of active and passive system enhancements.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The increase from FY23 to FY24 represents purchasing air-deployable prototype sensors in support of associated at-sea demonstrations and verifications.</p>												
Accomplishments/Planned Programs Subtotals								17.183	15.977	17.090	0.000	17.090
C. Other Program Funding Summary (\$ in Millions)												
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>	
• RDT&E/0480: ASW Sensors & Proc	38.956	46.001	43.874	-	43.874	44.284	44.981	45.882	46.794	Continuing	Continuing	
Remarks												
D. Acquisition Strategy												
Develop and mature acoustic and non-acoustic ASW technologies that have high potential for meeting documented capability gaps and Fleet requirements. As funding permits, transition those technologies to acquisition programs of record for eventual Fleet release on ASW platforms.												

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023					
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603254N / ASW Systems Development				Project (Number/Name) 1292 / Adv ASW Sensors & Proc							
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total					
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract		
Primary Hdw Development			Various	Various : Various	12.175	5.559	Dec 2021	5.066	Dec 2022	5.521	Dec 2023	-		5.521	Continuing	Continuing	Continuing
Subtotal				12.175	5.559			5.066		5.521		-		5.521	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total					
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract		
Software Development			WR	NAWCAD : PATUXENT RIVER, MD	11.788	3.780	Dec 2021	3.546	Dec 2022	3.781	Dec 2023	-		3.781	0.000	22.895	-
Studies & Analysis			WR	NAWCAD : PATUXENT RIVER, MD	12.776	2.636	Dec 2021	2.363	Dec 2022	2.194	Dec 2023	-		2.194	Continuing	Continuing	Continuing
Subtotal				24.564	6.416			5.909		5.975		-		5.975	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total					
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract		
Developmental Test & Evaluation (DT&E)			Various	Various : Various	32.568	3.172	Dec 2021	3.150	Dec 2022	3.580	Dec 2023	-		3.580	Continuing	Continuing	Continuing
Subtotal				32.568	3.172			3.150		3.580		-		3.580	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total					
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract		
Contractor Eng Spt			Various	Various : Various	25.590	1.186	Dec 2021	1.103	Dec 2022	1.151	Dec 2023	-		1.151	Continuing	Continuing	Continuing
ENG & TECH SVCS (NON-FFRDC)			Various	Various : Various	3.394	0.100	Dec 2021	0.100	Dec 2022	0.100	Dec 2023	-		0.100	Continuing	Continuing	Continuing
MGT & PROF SVCS (FFRDC)			Various	Various : Various	1.857	0.100	Dec 2021	0.091	Dec 2022	0.100	Dec 2023	-		0.100	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603254N / ASW Systems Development				Project (Number/Name) 1292 / Adv ASW Sensors & Proc					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Eng Spt	WR	NAWCAD : PATUXENT RIVER, MD	64.903	0.642	Dec 2021	0.550	Dec 2022	0.655	Dec 2023	-		0.655	Continuing	Continuing	Continuing
Travel	Various	VARIOUS : VARIOUS	0.188	0.008	Dec 2021	0.008	Dec 2022	0.008	Dec 2023	-		0.008	Continuing	Continuing	Continuing
Subtotal			95.932	2.036		1.852		2.014		-		2.014	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			165.239	17.183		15.977		17.090		-		17.090	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603254N / ASW Systems Development

Project (Number/Name)

1292 / Adv ASW Sensors & Proc



PMA-264 Advanced ASW Sensors & Processing (1292)

FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Performance Assessment

Data Analysis/Engineering Measurement

Adv ASW Sensing / UnderSea Advantage

Next Generation of Passive Sensors

Transition Decision

Initial Demonstration

Algorithm maturation & Software

Signal Processing Deliverables

Algorithm maturation & Signal Processing Development

Experiment/Exercise Participation

Over-the-side Demonstrations

Experiment/Exercise Participation

Trade Studies

Study and Analyze ASW processing & sensing system concepts and develop early prototypes

Congressional Add

Adv ASW technologies

Innovative AWS technologies

Deliveries

Test Articles

100

90

180

180

90

90

90

The RDT&E test articles, which consist of sensors, components and associated processors are employed and expended in support of and during in-water experimentation.

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603254N / ASW Systems Development

Project (Number/Name)

1292 / Adv ASW Sensors & Proc

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj: 1292 - Adv ASW Sensors & Processors				
Performance Assessment: Data Analysis/Engineering Measurement	1	2022	4	2028
Performance Assessment: Advanced ASW sensing / Undersea Advantage	1	2022	4	2028
Performance Assessment: Next Generation of Passive Sensors	1	2022	4	2026
Transition Decision: Initial Demonstration	4	2025	4	2025
Algorithm maturation & Software: Signal Processing Deliverable 1	1	2023	1	2023
Algorithm maturation & Software: Signal Processing Deliverable 2	3	2023	3	2023
Algorithm maturation & Software: Algorithm maturation & Signal Processing Development	1	2022	4	2028
Experiment/Exercise Participation: Over-the-side Demonstrations (1)	4	2022	4	2022
Experiment/Exercise Participation: Over-the-side Demonstrations (2)	3	2023	3	2023
Experiment/Exercise Participation: Over-the-side Demonstrations (3)	4	2023	4	2023
Experiment/Exercise Participation: Experiment/Exercise Participation	1	2022	4	2028
Trade Studies: Trade Studies	1	2022	4	2028
Congressional Add: Adv ASW technologies	1	2022	4	2022
Congressional Add: Innovative AWS technologies	2	2022	1	2024
Deliveries: Test Articles: FY22 Test Article Deliveries	1	2022	1	2022
Deliveries: Test Articles: FY23 Test Article Deliveries	2	2023	2	2023
Deliveries: Test Articles: FY24 Test Article Deliveries	1	2024	1	2024
Deliveries: Test Articles: FY25 Test Article Deliveries	1	2025	1	2025
Deliveries: Test Articles: FY26 Test Article Deliveries	1	2026	1	2026
Deliveries: Test Articles: FY27 Test Article Deliveries	1	2027	1	2027
Deliveries: Test Articles: FY28 Test Article Deliveries	1	2028	1	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603254N / ASW Systems Development				Project (Number/Name) 9999 / Congressional Adds			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	2.896	2.896	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.792
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification
FY22 \$2.896M Congressional Add for Innovative AWS technologies. Develop and mature acoustic and non-acoustic innovative ASW technologies.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023
Congressional Add: Innovative AWS technologies	2.896	0.000
FY 2022 Accomplishments: Support Congressional Add efforts.		
FY 2023 Plans: N/A		
Congressional Adds Subtotals	2.896	0.000

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
Develop, test and mature innovative ASW technologies. Funding applied to investments and innovative and operationally relevant sensors, processing, telemetry, and experimentation.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603254N / ASW Systems Development				Project (Number/Name) 9999 / Congressional Adds					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	Various	Various : Various	1.442	1.500	Aug 2022	0.000		0.000		-		0.000	0.000	2.942	-
Subtotal			1.442	1.500		0.000		0.000		-		0.000	0.000	2.942	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	Various	Various : Various	0.476	0.600	Aug 2022	0.000		0.000		-		0.000	0.000	1.076	-
Studies and Analysis	Various	Various : Various	0.678	0.546	Aug 2022	0.000		0.000		-		0.000	0.000	1.224	-
Subtotal			1.154	1.146		0.000		0.000		-		0.000	0.000	2.300	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Spt	WR	NAWCAD : PATUXENT RIVER, MD	0.300	0.250	Aug 2022	0.000		0.000		-		0.000	0.000	0.550	-
Subtotal			0.300	0.250		0.000		0.000		-		0.000	0.000	0.550	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			2.896	2.896		0.000		0.000		-		0.000	0.000	5.792	N/A
Remarks FY22 \$2.896M Congressional Add for Innovative AWS technologies.															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603254N / ASW Systems Development

Project (Number/Name)

9999 / Congressional Adds



PMA-264 Advanced ASW Sensors & Processing (1292)

FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Performance Assessment

Data Analysis/Engineering Measurement

Adv ASW Sensing / UnderSea Advantage

Next Generation of Passive Sensors

Transition Decision

Initial Demonstration

Algorithm maturation & Software

Signal Processing Deliverables

Algorithm maturation & Signal Processing Development

Experiment/Exercise Participation

Over-the-side Demonstrations

Experiment/Exercise Participation

Trade Studies

Study and Analyze ASW processing & sensing system concepts and develop early prototypes

Congressional Add

Adv ASW technologies

Innovative AWS technologies

Deliveries

Test Articles

100

90

180

180

90

90

90

The RDT&E test articles, which consist of sensors, components and associated processors are employed and expended in support of and during in-water experimentation.

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603254N / ASW Systems Development

Project (Number/Name)

9999 / Congressional Adds

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj: 1292 - Adv ASW Sensors & Processors				
Performance Assessment: Data Analysis/Engineering Measurement	1	2022	4	2028
Performance Assessment: Advanced ASW sensing / Undersea Advantage	1	2022	4	2028
Performance Assessment: Next Generation of Passive Sensors	1	2022	4	2026
Transition Decision: Initial Demonstration	4	2025	4	2025
Algorithm maturation & Software: Signal Processing Deliverable 1	1	2023	1	2023
Algorithm maturation & Software: Signal Processing Deliverable 2	3	2023	3	2023
Algorithm maturation & Software: Algorithm maturation & Signal Processing Development	1	2022	4	2028
Experiment/Exercise Participation: Over-the-side Demonstrations (1)	4	2022	4	2022
Experiment/Exercise Participation: Over-the-side Demonstrations (2)	3	2023	3	2023
Experiment/Exercise Participation: Over-the-side Demonstrations (3)	4	2023	4	2023
Experiment/Exercise Participation: Experiment/Exercise Participation	1	2022	4	2028
Trade Studies: Trade Studies	1	2022	4	2028
Congressional Add: Adv ASW technologies	1	2022	4	2022
Congressional Add: Innovative AWS technologies	2	2022	1	2024
Deliveries: FY22 Test Article Deliveries	1	2022	1	2022
Deliveries: FY23 Test Article Deliveries	2	2023	2	2023
Deliveries: FY24 Test Article Deliveries	1	2024	1	2024
Deliveries: FY25 Test Article Deliveries	1	2025	1	2025
Deliveries: FY26 Test Article Deliveries	1	2026	1	2026
Deliveries: FY27 Test Article Deliveries	1	2027	1	2027
Deliveries: FY28 Test Article Deliveries	1	2028	1	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>					R-1 Program Element (Number/Name) PE 0603261N / <i>Tactical Airborne Reconnaissance</i>							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	90.275	3.111	3.562	3.721	-	3.721	3.431	3.362	3.344	3.412	Continuing	Continuing
2467: <i>UxS Common Standards, Interoperability and Integration</i>	90.275	3.111	3.562	3.721	-	3.721	3.431	3.362	3.344	3.412	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element funds efforts to develop common technical and interoperability standards for current and future unmanned platforms, sensors, communications, and networking capabilities to achieve the required integration and interoperability of Unmanned Systems (UxS) represented in approved Naval Concept of Operations (CONOPS) in support of the Navy's Unmanned Campaign Framework.

This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies and representative models or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	3.111	3.562	3.708	-	3.708
Current President's Budget	3.111	3.562	3.721	-	3.721
Total Adjustments	0.000	0.000	0.013	-	0.013
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	0.013	-	0.013

Change Summary Explanation

Funding: FY 2024 was increased by \$0.013M due to inflation and adjustments in working capital fund rates.

Technical: Not applicable.

Schedule: Not applicable.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603261N / Tactical Airborne Reconnaissance				Project (Number/Name) 2467 / UxS Common Standards, Interoperability and Integration			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2467: UxS Common Standards, Interoperability and Integration	90.275	3.111	3.562	3.721	-	3.721	3.431	3.362	3.344	3.412	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Naval Unmanned Aircraft Systems (UAS) strategy employs a family of UAS to perform various missions in support of naval and joint service missions from forward bases/platforms and naval ships.

In support of the Navy and Marine Corps' overall UAS strategy, this program develops common technical and interoperability standards for current and future unmanned platforms, sensors, communications, and networking capabilities to achieve the integration and interoperability of UAS represented in approved Naval Concept of Operations (CONOPS) in support of the Navy's Unmanned Campaign Framework. Leveraging fleet input based on current operations and informed by future operational plans, these efforts ensure the desired interoperability and integration of Unmanned Systems (UxS) throughout the battlespace is achieved. This program also establishes the common architecture, including command & control, for all unmanned systems to support and inform future CONOPS development. This effort provides for a cross program view of naval unmanned systems and is the entry point for DoN and other services to address commonality and interoperability opportunities.

Specifically:

- Provides studies and demonstrations in support of Naval UAS Family of Systems (FoS) CONOPS development.
- Horizontally integrates across the Naval UAS FoS through the development of Naval Interoperability Profiles to achieve required unmanned capabilities and interoperability.
- Provides support for development of common and interoperable UAS standards for use throughout the Department of Defense (DoD) and the North Atlantic Treaty Organization (NATO).
- Conducts CONOPS studies, demonstrations, advanced development/prototyping, exercises for vehicle control, targeting, and weapons, sensor and payload employment.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Studies and Demonstrations	1.806	1.931	2.023	0.000	2.023
Articles:	-	-	-	-	-
Description: Studies and demonstrations to support CONOPS development from an interoperability perspective for effective integration of UAS. Develop a UAS architecture environment to allow for effective modeling and simulation of common UAS components in representative battlespace architectures.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603261N / Tactical Airborne Reconnaissance		Project (Number/Name) 2467 / UxS Common Standards, Interoperability and Integration		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>FY 2023 Plans: Continue development of the UAS modeling and simulation of Fleet CONOPS scenarios in support of the Navy Unmanned Campaign Framework. Demonstrate Manned/Unmanned Teaming interoperability and UAS autonomous capabilities. Provide technical government engineering support.</p> <p>FY 2024 Base Plans: Continue development of the UAS modeling and simulation of Fleet CONOPS scenarios in support of the Navy Unmanned Campaign Framework. Demonstrate Manned/Unmanned Teaming interoperability and UAS autonomous capabilities. Provide technical government engineering support.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The increase of \$0.092M is due to inflation and rate adjustments.</p>						
<p>Title: Naval Interoperability & Standardization</p> <p>Articles:</p> <p>Description: Develop UAS common technical standards implementations to achieve desired capabilities and interoperability between manned/unmanned systems.</p> <p>FY 2023 Plans: Continue to develop Unmanned Systems Naval Interoperability Profiles in support of approved Naval CONOPS. Support DoN, Joint Service and NATO coalition standardization and interoperability efforts. Provide government engineering support and contract services.</p> <p>FY 2024 Base Plans: Continue to develop Unmanned Systems Naval Interoperability Profiles in support of approved Naval CONOPS. Support DoN, Joint Service and NATO coalition standardization and interoperability efforts. Provide government engineering support and contract services.</p> <p>FY 2024 OCO Plans:</p>		1.305 -	1.631 -	1.698 -	0.000 -	1.698 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603261N / <i>Tactical Airborne Reconnaissance</i>		Project (Number/Name) 2467 / <i>UxS Common Standards, Interoperability and Integration</i>	
<u>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</u>					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A					
<i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> The increase of \$0.067M is due to inflation and rate adjustments.					
Accomplishments/Planned Programs Subtotals	3.111	3.562	3.721	0.000	3.721
<u>C. Other Program Funding Summary (\$ in Millions)</u> N/A					
<u>Remarks</u>					
<u>D. Acquisition Strategy</u> The department will leverage existing government facilities and resources to develop common technical and interoperability standards for current and future unmanned sensors, communications, and networking capabilities to achieve the required interoperability and integration of unmanned systems represented in approved Naval Concept of Operations (CONOPS). Government engineering support will be used for standards development, architectural analysis, modeling and simulation efforts and testing.					

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603261N / Tactical Airborne Reconnaissance				Project (Number/Name) 2467 / UxS Common Standards, Interoperability and Integration					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior year Prod Dev no longer funded in the FYDP	Various	Various : Various	18.711	0.000		0.000		0.000		-		0.000	0.000	18.711	-
Subtotal			18.711	0.000		0.000		0.000		-		0.000	0.000	18.711	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Studies & Demonstrations	WR	NAWCAD : Pax River, MD	5.865	0.155	Dec 2021	0.211	Dec 2022	0.260	Dec 2023	-		0.260	Continuing	Continuing	Continuing
Standards Development	C/CPFF	Engility : Lexington Park, MD	8.306	1.239	Apr 2022	1.548	Apr 2023	0.350	Apr 2024	-		0.350	Continuing	Continuing	Continuing
Standards Development	MIPR	Eglin AFB : Eglin, FL	0.000	0.000		0.000		0.700	Nov 2023	-		0.700	0.000	0.700	-
Prior year Support no longer funded in the FYDP	Various	Various : Various	29.815	0.000		0.000		0.000		-		0.000	0.000	29.815	-
Subtotal			43.986	1.394		1.759		1.310		-		1.310	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	Various	Various : Various	2.627	0.000		0.000		0.000		-		0.000	0.000	2.627	-
Subtotal			2.627	0.000		0.000		0.000		-		0.000	0.000	2.627	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603261N / Tactical Airborne Reconnaissance				Project (Number/Name) 2467 / UxS Common Standards, Interoperability and Integration					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Various	Various : Various	5.722	0.067	Jan 2022	0.083	Jan 2023	0.648	Jan 2024	-		0.648	Continuing	Continuing	Continuing
Government Engineering Support	WR	NAWCAD : Pax River, MD	17.619	1.650	Dec 2021	1.720	Dec 2022	1.763	Dec 2023	-		1.763	Continuing	Continuing	Continuing
Travel	WR	NAVAIR HQ : Pax River, MD	0.560	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Prior year Mgmt Services no longer funded in the FYDP	Various	Various : Various	1.050	0.000		0.000		0.000		-		0.000	0.000	1.050	-
Subtotal			24.951	1.717		1.803		2.411		-		2.411	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			90.275	3.111		3.562		3.721		-		3.721	Continuing	Continuing	N/A
Remarks															

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[illegible]

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2467 / UxS Common Standards,
Interoperability and Integration[illegible]

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603261N / Tactical Airborne Reconnaissance	Project (Number/Name) 2467 / UxS Common Standards, Interoperability and Integration

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
UxS Common Standards, Interoperability and Integration				
Studies and Demonstrations:	1	2022	4	2028
Naval Interoperability and Standardization:	1	2022	4	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	125.286	40.937	73.128	6.216	-	6.216	2.051	2.088	2.038	2.080	Continuing	Continuing
0324: Adv Combat System Technology	10.558	1.519	2.480	2.216	-	2.216	2.051	2.088	2.038	2.080	Continuing	Continuing
2480: SSL-TM	21.050	11.882	16.148	4.000	-	4.000	0.000	0.000	0.000	0.000	0.000	53.080
3422: SHARC Surface Platform	28.688	3.630	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	32.318
3423: LOCUST	6.886	3.270	40.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	50.156
3437: EMW/SEWIP/SSEE Accelerator	58.104	17.740	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	75.844
9999: Congressional Adds	0.000	2.896	14.500	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	17.396

A. Mission Description and Budget Item Justification

Open architecture sets standards for technology fields to promote interoperability. For defense systems, standards enable interconnectivity across services and in coalition operations at machine-to-machine speeds. Reducing barriers associated with proprietary software speeds development and delivery of warfighting advantage. The Advanced Combat System Technology line is to evolve the technical and business practices for programs to change to an open architecture construct. The program was constructed to mature both technical and business model integration for C5I systems programs of record in an open architecture environment. The priority was incorporating the principles of modular design and design disclosure, reusable application software, interoperability and secure information exchange, lifecycle affordability and encouraging competition and collaboration.

Project Unit 0324: Funding is to implement of the Naval Open Systems Architecture (OSA) strategy. The implementation of this strategy provides the tools and leadership for assisting programs and the Naval Research and Development Establishment through the technical, business and cultural transition to OSA. The primary tools and assistance will be established through an enterprise reference architecture that transforms and standardizes the Navy technical and interoperability baseline and through related enterprise sandbox technologies with consistent contract language guidance, Intellectual Property strategies and improvements in transparency of design disclosure and information exchange on past and current investments to support portfolio management and cross-program reuse. Applicable small business technologies such as Automated Test/Re-Test will also be leveraged to facilitate the Navy's implementation of OSA. The OSA transformation effort will be applied to programs of record. Those elements include ensuring that naval systems, families of systems, programs and prototypes move to modular OSA in accordance with DoD Instruction 5000.01 of 7 Jan 2015 which mandates that all DoD programs utilize Modular OSA to field affordable and interoperable systems. This project facilitates a strategic shift in the technical and business methods to establish cooperation and cross-domain/COI business relationships. This improves innovation and economies of scale throughout the Navy and Marine Corps. This project includes identification of business cases and return on investment for moving the Navy towards an open systems approach, supported by the development of open systems technologies and integrated best business and technical practices for open systems development within Naval acquisition. This project also supports Systems engineering and acquisition services to deliver capabilities through acquisition, development, integration, production, test, deployment and sustainment of interoperable command, control, communication, computers, intelligence, surveillance reconnaissance,

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech	
<p>cyber, microelectronics, and information technology capabilities enabling Information Warfare, un-crewed systems, and other functions. Naval OSA ensures Navy-wide system architectures become extensible and scalable in function, capacity, and workload to meet Joint warfighting requirements. This also includes the identification and development of common software components, functions, reuse methodologies, and extensible product lines.</p> <p>Project Unit 2480: The efforts described in this mission area address the advanced component development and prototype demonstration associated with the Navy's Solid State Laser Technology Maturation (SSL-TM) Innovative Naval Prototypes (INP) Program and the Leap Ahead Technology (LA-Tech) investments. The SSL-TM program is developing an integrated Laser Weapons System Demonstrator (LWSD). SSL-TM will provide a new capability to the Fleet to address known capability gaps against asymmetric threats (UAS, small boats, and ISR sensors) and will inform future acquisition strategies, system designs, integration architectures, and fielding plans for laser weapon systems.</p> <p>Project Unit 3422: The SHARC Surface Platforms demonstration project is part of the Department of Defense Third Offset Strategy as one element in the Sensor Grid category for 24/7 autonomy infused Situational Awareness (SA). This project will purchase Commercial-off-the-Shelf SHARC Platforms (wave gliders) and integrate four (4) unique Government-owned classified mission payloads focused on the detection of threats. These capabilities will enable CONOPS development in an operationally relevant environment to demonstrate how these technologies can improve the SA to the battlespace Commanders.</p> <p>Project Unit 3423: The LOCUST demonstration is part of the Department of Defense Third Offset Strategy as one element in the Effector Grid category for small autonomous systems. LOCUST leverages the BA-3 Innovative Naval Prototype program developing and demonstrating swarming technology. The BA-3 effort is developing both the air vehicle, UAS swarming behaviors, and miniaturized sensor systems. ONR has demonstrated an autonomous system capable of launching 33 UASs in 40 seconds and flying them in a coordinated swarm. This BA-4 effort is trailing the BA-3 demonstration of technologies by a fiscal quarter and then demonstrating the technology in operationally relevant environments with military mission applications.</p> <p>Project 3437: The EMW/SEWIP/SSEE Accelerator is part of the Department of Defense Third Offset Strategy to improve real time Electro-Magnetic Maneuver Warfare operations. This effort will develop integrated cross platform active and passive sensing solutions, next generation network and real time spectrum operations.</p> <p>Project 3438: This activity addresses the advanced component development and prototype demonstration associated with ONR's Innovative Naval Prototypes (INP) Program and the Leap Ahead Technology (LA-Tech) investments. INP and LA-Tech investments represent game changing technologies with the potential to revolutionize operational concepts. They are disruptive in nature as they would dramatically change the way naval forces fight. INPs and LA-Techs push the imagination of our nation's technical talent to deliver transformational warfighting capabilities. Investments may include such mission areas as Unmanned and Autonomous Systems, Directed Energy / Electric Weapons, Electromagnetic Maneuver Warfare, Cyber Warfare, and Undersea Warfare.</p> <p>Advanced Component Development and Prototypes (ACD&P) efforts necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment are funded in this PE. Most of the work in this PE can be classified between Technology Readiness Level (TRL) 6 (system/subsystem model or prototype demonstration in a relevant environment) and TRL 7 (system prototype demonstration in an operational environment).</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0603382N / Advanced Combat Systems Tech			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	35.310	18.628	2.205	-	2.205
Current President's Budget	40.937	73.128	6.216	-	6.216
Total Adjustments	5.627	54.500	4.011	-	4.011
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	54.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	6.700	0.000			
• SBIR/STTR Transfer	-1.073	0.000			
• Program Adjustments	0.000	0.000	4.000	-	4.000
• Rate/Misc Adjustments	0.000	0.000	0.011	-	0.011
Congressional Add Details (\$ in Millions, and Includes General Reductions)					
Project: 9999: Congressional Adds					
Congressional Add: <i>Minotaur data dissemination and interoperability</i>					
Congressional Add: <i>Force-level dynamic interoperable C2</i>					
Congressional Add Subtotals for Project: 9999					
Congressional Add Totals for all Projects					
Change Summary Explanation					
\$4M increase in FY 2024 supports the de-installation and program completion expenses for Solid-State Laser Technology Maturation (SSL-TM) program.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603382N / <i>Advanced Combat Systems Tech</i>				Project (Number/Name) 0324 / <i>Adv Combat System Technology</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0324: <i>Adv Combat System Technology</i>	10.558	1.519	2.480	2.216	-	2.216	2.051	2.088	2.038	2.080	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funding is to implement of the Naval Open Systems Architecture (OSA) strategy. The implementation of this strategy provides the tools and leadership for assisting programs and the Naval Research and Development Establishment through the technical, business and cultural transition to OSA. The primary tools and assistance will be established through an enterprise reference architecture that transforms and standardizes the Navy technical and interoperability baseline and through related enterprise sandbox technologies with consistent contract language guidance, Intellectual Property strategies and improvements in transparency of design disclosure and information exchange on past and current investments to support portfolio management and cross-program reuse. Applicable small business technologies such as Automated Test/Re-Test will also be leveraged to facilitate the Navy's implementation of OSA.

The OSA transformation effort will be applied to CNO priority capability deliveries. Those elements include ensuring that naval systems, families of systems, microelectronics, modeling and simulation, ADENA, Digital Transformation programs and prototypes to collectively move to modular OSA in accordance with DoD Instruction 5000.01 of 7 Jan 2015 which mandates that all DoD programs utilize Modular OSA to field affordable and interoperable systems. This project supports the Naval strategic shift in the technical and business methods to establish cooperation and cross-domain/COI business relationships. This improves innovation and economies of scale throughout the Navy and Marine Corps.

This project includes identification of business cases and return on investment for moving the Navy towards an open systems approach, supported by the development of open systems technologies and integrated best business and technical practices for open systems development within Naval acquisition.

This project also supports Systems engineering and acquisition services to deliver capabilities through acquisition, development, integration, production, test, deployment and sustainment of interoperable command, control, communication, computers, intelligence, surveillance reconnaissance, cyber, and information technology capabilities enabling Information Warfare; and other functions. Naval OSA ensures Navy-wide system architectures become extensible and scalable in function, capacity, and workload to meet Joint warfighting requirements. This also includes the identification and development of common software components, functions, reuse methodologies, and extensible product lines.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: OSA Prototyping and Demonstration	0.450	0.766	0.674	0.000	0.674
Articles:	-	-	-	-	-
FY 2023 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech		Project (Number/Name) 0324 / Adv Combat System Technology		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Continue to coordinate the development and scaling of supporting OSA enablers that include the Navy's Integrated Model Environment (IME) the Digital Warfighting Platform (DWP), and related enterprise sandbox technologies, with associated open standards and policy guidance development that enable application development conforming to open software development kits and application programming interfaces.</p> <p>- Continue to coordinate the prototyping, demonstration, and transition of OSA technologies to validate performance metrics, models, design, and system-of system requirements to meet fleet requirements.</p> <p>- Continue to coordinate the development of open standards and interfaces supported by the Automated Test/ Retest (ATRT) tool suite to enable further integration of third party tools and capabilities leveraging OSA.</p> <p>FY 2024 Base Plans:</p> <p>- Continue to coordinate the prototyping and demonstration of supporting OSA technologies and enablers that may include Modeling and Simulation, Live-Virtual-Constructive and related enterprise digital battlespace and sandbox technologies, cybersecurity and information assurance technologies, cloud technologies, network technologies, artificial intelligence/machine learning, automated test technologies, and microelectronics. Continue development of associated open standards and policy that enable application development conforming to open software development kits and application programming interfaces.</p> <p>Continue to coordinate the prototyping, demonstration, and transition of OSA technologies to validate performance metrics, models, design, and system-of system requirements for crewed and un-crewed platforms, systems, and operational, simulated and developmental environments.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease of \$92K from FY23 to FY24 is due to various program phasing plan adjustments to maintain alignment with supported programs and systems.</p>						
Title: OSA Scaling and Integration		1.069	1.406	1.234	0.000	1.234
Articles:		-	-	-	-	-
FY 2023 Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech		Project (Number/Name) 0324 / Adv Combat System Technology		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Continue to integrate Modular Open Systems Architecture capabilities and standards into the Navy's enterprise sandbox technologies and digital warfighting systems, with associated software development practices, policy changes, and standards development that enable improved test and evaluation, validation, verification, and certification of naval systems.</p> <p>- Leverage OSA implemented on the DWP and the sandbox, as supported by systems engineering and microelectronic subject matter expert support and enabling technologies such as Automated Test/Re-Test (ATRT) and the Force-Level Interoperability SoS Testbed (FLIST), to further scale prototyping, experimentation, demonstration, analysis, implementation and adoption of OSA for various Battle Management Aids (BMAs) / Mission Planning Aids (MPs) that include Artificial Intelligence / Machine Learning (AI/ML) applications, Networking capabilities, C2, data and track management tools and other common services, and related supporting hardware compute infrastructure solutions and related enterprise sandbox technologies.</p> <p>FY 2024 Base Plans:</p> <p>- Continue to scale and integrate Modular Open Systems Architecture capabilities and standards into the Navy's enterprise digital battlespace and sandbox technologies and digital warfighting systems, with associated software development practices, policy changes, and standards development that enable improved test and evaluation, validation, verification, and certification of naval systems.</p> <p>- Leverage OSA, the digital battlespace and the sandbox, as supported by systems engineering and microelectronic subject matter expert support and enabling technologies such as Automated Test/Re-Test (ATRT) to further scale the integration, implementation and adoption of OSA for various enterprise developmental and operational environments and crewed/un-crewed systems which may include various Battle Management Aids (BMAs) / Mission Planning Aids (MPs), Artificial Intelligence / Machine Learning (AI/ML), Networking capabilities, C2, data, track management tools and other common services, enterprise digital battlespace and sandbox and/or Modeling and Simulation / Live-Virtual-Constructive environments, related supporting hardware compute infrastructure solutions and microelectronics, related cloud technologies, and related enterprise sandbox technologies.</p> <p>FY 2024 OCO Plans:</p> <p>N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech		Project (Number/Name) 0324 / Adv Combat System Technology		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Decrease of \$172K from FY23 to FY24 due to various program phasing plan adjustments to maintain alignment with supported programs and systems.						
Title: OSA Systems Engineering and Analysis		0.000	0.308	0.308	0.000	0.308
Articles:		-	-	-	-	-
FY 2023 Plans:						
- Continue to coordinate the development and scaling of supporting OSA enablers that include the Navy's Integrated Model Environment (IME), the DWP, and related enterprise technologies, with associated open standards and policy guidance development that enable application development conforming to open software development kits and application programming interfaces.						
- Continue to coordinate the prototyping, demonstration, and transition of OSA technologies to validate performance metrics, models, design, and system-of system requirements to meet fleet requirements.						
- Continue to coordinate the development of open standards and interfaces supported by the Automated Test/ Retest (ATRT) tool suite to enable further integration of third party tools and capabilities leveraging OSA.						
FY 2024 Base Plans:						
- Continue to provide systems engineering support and analysis to coordinate the prototyping, demonstration, scaling, and integration of supporting OSA technologies and enablers that may include Modeling and Simulation, Live-Virtual-Constructive and related enterprise digital battlespace and sandbox technologies, cybersecurity and information assurance technologies, cloud technologies, network technologies, artificial intelligence/machine learning, automated test technologies, and microelectronics.						
- Continue development of associated open standards and policy that enable application development conforming to open software development kits and application programming interfaces.						
- Continue to provide systems engineering support and analysis to coordinate the prototyping, demonstration, scaling, integration, and transition of OSA technologies to validate performance metrics, models, design, and system-of system requirements for crewed and un-crewed platforms, systems, and operational, simulated, and developmental environments.						
FY 2024 OCO Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023	
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech				Project (Number/Name) 0324 / Adv Combat System Technology			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)											
				FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total			
N/A											
Accomplishments/Planned Programs Subtotals				1.519	2.480	2.216	0.000	2.216			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTEN/0307577N: Intelligence Mission Data (IMD)	0.907	0.851	0.788	-	0.788	0.793	0.807	0.821	0.837	Continuing	Continuing
• RDTEN/0308601N/2222: Modeling & Simulation	9.479	9.437	10.994	-	10.994	10.924	10.772	10.957	11.180	Continuing	Continuing
Remarks											
This effort synergizes with and leverages/supports other funded efforts including Intelligence Mission Data (IMD) (RDTEN/PE 0307577N) and Modeling & Simulation Support (RDTEN/PE 0308601N, OMN/4B3N) to support development of the Naval Operational Architecture, warfighting digital transformation efforts, and enterprise digital battlespace and sandbox technologies and environments.											
D. Acquisition Strategy											
This is a non-ACAT program. This project has been a Navy Acquisition Executive directed effort to fundamentally alter the business, technical and policy environment for warfare systems acquisition to result in improved affordability, increased access to innovation, entrepreneurialship, a reduction in time to field, improved operational availability, agility, and promote cultural environment change. The Navy's OSA Enterprise effort built off past successes such as the Acoustic Rapid Commercial-off-the-Shelf Insertion (ARCI) program policy statement dated 5 August 2004, the Deputy Chief of Naval Operations (DCNO) requirement dated 23 December 2005, and the Naval OSA Strategy of 2011) and is now being extended and scaled for applicability across the Department of the Navy to enable open, affordable and rapid integrated capability development. This effort continues to expand into and enable related strategic support for Rapid Prototyping, Experimentation and Demonstration and the leveraging of large and small business capabilities, the defense industrial base, government laboratories, and academia partnered with agile contracting approaches to support the evolution of the business, technical and policy landscape for warfare systems acquisition.											
This effort synergizes with and supports other funded efforts including Intelligence Mission Data (IMD) (RDTEN/PE 0307577N) and Modeling & Simulation Support (RDTEN/PE 0308601N, OMN/4B3N) to support development of the Naval Operational Architecture, warfighting digital transformation efforts, and enterprise digital battlespace and sandbox technologies and environments.											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech				Project (Number/Name) 0324 / Adv Combat System Technology					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
OSA Prototyping and Demonstration (1)	Various	WFCs : Various	3.902	0.464	Mar 2022	0.756	Mar 2023	0.607	Mar 2024	-		0.607	Continuing	Continuing	Continuing
OSA Scaling and Integration (1)	Various	NSWC, NRL, NUWC, NAWC WD; NAWC AD, VARIOUS : Various	2.932	0.794	Apr 2022	1.185	Apr 2023	1.106	Mar 2024	-		1.106	Continuing	Continuing	Continuing
OSA Systems Engineering and Analysis	Various	Various : Various	0.000	0.000		0.297	Apr 2023	0.277	Mar 2024	-		0.277	Continuing	Continuing	Continuing
Subtotal			6.834	1.258		2.238		1.990		-		1.990	Continuing	Continuing	N/A
Remarks															
(1) Funding changes from FY23 to FY24 are due to various program phasing plan adjustments to maintain alignment with supported programs and systems.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPAF	Miscellaneous : VARIOUS	3.724	0.261	Mar 2022	0.242	Mar 2023	0.226	Mar 2024	-		0.226	Continuing	Continuing	Continuing
Subtotal			3.724	0.261		0.242		0.226		-		0.226	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			10.558	1.519		2.480		2.216		-		2.216	Continuing	Continuing	N/A
Remarks															
Decrease of \$264K from FY 2023 to FY 2024 is due to various program phasing plan adjustments to maintain alignment with supported programs and systems.															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																							Date: March 2023				
Appropriation/Budget Activity 1319 / 4												R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech								Project (Number/Name) 0324 / Adv Combat System Technology							

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech	Project (Number/Name) 0324 / Adv Combat System Technology	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 0324				
Implement OSA: OSA Prototyping and Demonstration	1	2022	4	2028
Implement OSA: OSA Scaling and Integration	1	2022	4	2028
Implement OSA: OSA Systems Engineering and Analysis	1	2023	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603382N / <i>Advanced Combat Systems Tech</i>				Project (Number/Name) 2480 / <i>SSL-TM</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2480: <i>SSL-TM</i>	21.050	11.882	16.148	4.000	-	4.000	0.000	0.000	0.000	0.000	0.000	53.080
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

This PU 2480 includes Solid State Laser Technology Maturation (SSL-TM) resources and associated plans intended to provide advanced component development and prototyping for selected SSL-TM technologies maturing out of ONR's supporting Innovative Naval Prototype (INP) BA3 portfolio.

A. Mission Description and Budget Item Justification

The efforts described in this mission area address the advanced component development and prototype demonstration associated with the Navy's Solid State Laser Technology Maturation (SSL-TM) Innovative Naval Prototypes (INP) Program investments. The SSL-TM program is developing an integrated Laser Weapons System Demonstrator (LWSD). SSL-TM will provide a new capability to the Fleet to address known capability gaps against asymmetric threats (UAS, small boats, and ISR sensors) and will inform future acquisition strategies, system designs, integration architectures, and fielding plans for laser weapon systems. Based on ship's schedule, SSL-TM is planned to start de-installation, ship restoration, and hardware disposition activities during FY23.

INP and LA-Tech investments represent game changing technologies with the potential to revolutionize operational concepts. They are disruptive in nature as they would dramatically change the way naval forces fight. INPs and LA-Techs push the imagination of our nation's technical talent to deliver transformational warfighting capabilities. Successful demonstrations are intended to present the Department of the Navy with a programmatic challenge as these new capabilities can lead to the obsolescence of existing capabilities and significant decisions as to the path forward for integrating the new technological capabilities into the warfighting systems of the future.

ONR manages a continuum of INP and LA-Tech development from BA2 to BA3 to BA4. The goal of these BA4 investments is to further mature development and expend efforts necessary to evaluate integrated technologies, representative modes or prototype systems in high fidelity and realistic operating environments. This BA4 investment includes system specific efforts that help expedite technology transition from the laboratory to operational use. Emphasis is on proving component and subsystem maturity prior to integration in major and complex systems and may involve risk reduction initiatives. Projects in this category involve efforts prior to Milestone B and are referred to as advanced component development activities and include technology demonstrations. It is the goal of these projects to achieve Technology Readiness Levels 6 or 7. Successful experimentation and demonstration highlights the viability of new technological capabilities that could be implemented if an acquisition program were to be established to support further development. The portfolio is periodically refreshed through the selection of new INPs and LA-Tech investments as existing ones are completed.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Solid State Laser Technology Maturation (SSL-TM)	11.882	16.148	4.000	0.000	4.000
Articles:	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603382N / <i>Advanced Combat Systems Tech</i>		Project (Number/Name) 2480 / <i>SSL-TM</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Description: The Solid State Laser Technology Maturation (SSL-TM) Program is developing an integrated Laser Weapons System Demonstrator (LWSD) that will be installed on USS Portland (LPD-27) during FY 2019 with investments funded in the BA3 Innovative Naval Prototypes Program Element 0603801N. The investment programmed in Program Element 0603382N, Advanced Combat Systems Technology, funds costs for extended at-sea experimentation, operations, and support of the installed system on LPD-27 in the Pacific operating areas. SSL-TM will provide a new capability to the Fleet to address known capability gaps against asymmetric threats (UAS, small boats, and ISR sensors) and will inform future acquisition strategies, system designs, integration architectures, and fielding plans for laser weapon systems.</p> <p>FY 2023 Plans: Initiate Laser Weapons System Demonstrator de-installation.</p> <p>Complete final report, program closeout and hardware disposition after equipment is removed from the ship.</p> <p>FY 2024 Base Plans: Complete Laser Weapons System Demonstrator de-installation.</p> <p>Complete delayed final report, lessons learned and program closeout for SSL-TM program.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The decrease in funding from FY 2023 to FY 2024 in the SSL-TM project is due to completing the effort in FY 2024.</p>						
Accomplishments/Planned Programs Subtotals		11.882	16.148	4.000	0.000	4.000
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy The projects identified for execution are non-acquisition programs. The Office of Naval Research will provide Government oversight to the projects. Each project will develop a project plan to support execution. Project plans will include a schedule and the necessary technical requirements and objectives to measure and evaluate						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / <i>Advanced Combat Systems Tech</i>	Project (Number/Name) 2480 / <i>SSL-TM</i>
<p>performance. Additionally, each project will be subjected to experimentation then demonstrated in operationally relevant environments to assess their ability to meet warfighter requirements. Project deliverables will include the actual integrated hardware/software prototype systems, test reports, and technical data, necessary to support decision making. These decisions include the transition of technologies to acquisition, further refinement of the technology, or termination and reinvestment of remaining funds to other technologies that add military value.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603382N / <i>Advanced Combat Systems Tech</i>				Project (Number/Name) 2480 / <i>SSL-TM</i>					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	Naval Surface Warfare Center Dahlgren Division : Dahlgren, VA	3.185	0.600	Oct 2021	0.900	Oct 2022	0.000		-		0.000	0.000	4.685	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	Naval Surface Warfare Center, Port Hueneme Divisio : Port Hueneme, CA	13.068	2.670	Oct 2021	0.400	Oct 2022	0.000		-		0.000	0.000	16.138	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	C/CPFF	Northrup Grumman : Redondo Beach, CA	4.462	1.000	Oct 2021	0.700	Oct 2022	0.000		-		0.000	0.000	6.162	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	Naval Surface Warfare Center Crane Division : Crane, IN	0.000	0.150	Oct 2021	0.150	Oct 2022	0.000		-		0.000	0.000	0.300	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	MIPR	MITRE : Aberdeen Proving Ground, MD	0.000	0.050	Oct 2021	0.050	Oct 2022	0.000		-		0.000	0.000	0.100	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	C/CPFF	RCT Systems Inc : Baltimore, MD	0.000	0.462	Oct 2021	0.203	Oct 2022	0.000		-		0.000	0.000	0.665	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	C/CPFF	Gryphon Technologies : Washington, DC	0.000	0.250	Oct 2021	0.145	Oct 2022	0.000		-		0.000	0.000	0.395	-
Developmental Test & Evaluation (DT&E)	C/CPFF	Naval Surface Warfare Center, Port Hueneme Divisio : Port Hueneme, CA	0.335	0.000		0.300	Oct 2022	0.750	Dec 2023	-		0.750	0.000	1.385	-
Developmental Test & Evaluation (DT&E)	WR	Naval Surface Warfare Center Dahlgren Division : Dahlgren, VA	0.000	0.000		0.750	Oct 2022	1.250	Dec 2023	-		1.250	0.000	2.000	-
Developmental Test & Evaluation (DT&E)	WR	Naval Surface Warfare Center	0.000	0.000		1.550	Oct 2022	0.500	Dec 2023	-		0.500	0.000	2.050	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech				Project (Number/Name) 2480 / SSL-TM					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Crane Division : Cran : Crane, IN													
Developmental Test & Evaluation (DT&E)	C/CPFF	Huntington Ingalls : Not Specified	0.000	0.000		0.500	Oct 2022	0.250	Dec 2023	-		0.250	0.000	0.750	-
Developmental Test & Evaluation (DT&E)	SS/IDIQ	CACI : Chantilly, VA	0.000	6.700	Jun 2022	9.000	Oct 2022	0.250	Dec 2023	-		0.250	0.000	15.950	-
Developmental Test & Evaluation (DT&E)	TBD	TBD1 : Not Specified	0.000	0.000		0.750	Oct 2022	0.250	Dec 2023	-		0.250	0.000	1.000	-
Developmental Test & Evaluation (DT&E)	TBD	TBD2 : Not Specified	0.000	0.000		0.750	Oct 2022	0.750	Dec 2023	-		0.750	0.000	1.500	-
Subtotal			21.050	11.882		16.148		4.000		-		4.000	0.000	53.080	N/A
Remarks															
Increase funding to CACI and various subcontractors for de-installation, disposal, and final reporting costs.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			21.050	11.882		16.148		4.000		-		4.000	0.000	53.080	N/A
Remarks															

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech	Project (Number/Name) 2480 / SSL-TM	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2480				
SSL-TM: Sustainment & Maintenance (Groom Events): Sustainment & Maintenance (Groom Events)	1	2022	3	2023
SSL-TM: System Checkout and Data Collection: System Checkout and Data Collection	1	2022	3	2023
SSL-TM: Training, Demonstration & Experimentation Events: Training, Demonstration & Experimentation Events	1	2022	3	2023
SSL-TM: De-installation and Closeout: De-installation, final report, program closeout and hardware disposition	2	2023	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603382N / <i>Advanced Combat Systems Tech</i>				Project (Number/Name) 3422 / <i>SHARC Surface Platform</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3422: <i>SHARC Surface Platform</i>	28.688	3.630	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	32.318
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Sensor Hosting Autonomous Remote Craft (SHARC) Surface Platforms demonstration project is part of the Department of Defense Third Offset Strategy as one element in the Sensor Grid category for 24/7 autonomy infused Situational Awareness (SA). This project will purchase Unmanned Surface Vehicle (USV), autonomous wave gliders, and integrate four (4) unique Government-owned classified mission payloads focused on the detection of threats. The successful demonstration of one particular payload integration to support a high priority warfighting mission area will be followed by a prototype operational event. The full mission cannot be executed without the full array / mission set quantity. Without full mission execution, this will jeopardize our armed forces security by degrading and delaying a critical joint capability. These capabilities will enable Concepts of Operation (CONOPS) development in an operationally relevant environment to demonstrate how these technologies can improve the SA to the battlespace Commanders. This includes persistent, autonomous SA and early warning of submarines or related submarine activity as well as broad area, clandestine implementation of capabilities that enhance Intelligence Preparation of the Battlefield (IPB) and strike missions.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Sensor Hosting Autonomous Remote Craft (SHARC)	3.630	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: This project will demonstrate the warfighting utility of multiple, long endurance platforms with classified payloads conducting critical Intelligence, Surveillance and Reconnaissance (ISR) missions with simultaneous, wideband data links for signal and imagery data transmission between host assets and Operational level processing systems. Emerging technologies and engineering innovations from Naval/DoD research and development and industry, will be integrated to demonstrate secure and reliable collection, analysis, tactical level access to host asset ISR data and fusion of ISR and targeting data from organic assets and sensors.					
FY 2023 Plans: N/A					
FY 2024 Base Plans: N/A					
FY 2024 OCO Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603382N / <i>Advanced Combat Systems Tech</i>		Project (Number/Name) 3422 / <i>SHARC Surface Platform</i>	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A					
Accomplishments/Planned Programs Subtotals	3.630	0.000	0.000	0.000	0.000
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					
D. Acquisition Strategy					
FY 2019: T&E Milestone: Developmental Test (DT) and assessment of initial payloads installed on USV wave glider platforms					
FY 2020: T&E Milestone: DT and assessment of additional payloads installed on USV wave glider platforms					
FY 2021: T&E Milestone: Build and validate readiness of integrated Prototype Operational units					
FY 2022: T&E and Transition Milestone: COCOM Final Full Mission System Set Operational Demonstration and Transition to OPNAV N2N6F3.					

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech				Project (Number/Name) 3422 / SHARC Surface Platform					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Requirements and CONOPS Development	MIPR	Naval Undersea Warfare Center (NUWC) : Keyport, WA	1.775	0.400	Oct 2021	0.000		0.000		-		0.000	0.000	2.175	-
System & Payload Design, Engineering, and Integration	MIPR	Space and Naval Warfare System Center Pacific (SSC : San Diego, CA	9.703	0.950	Oct 2021	0.000		0.000		-		0.000	0.000	10.653	-
Purchase COTS SHARC platforms	C/FFP	Space and Naval Warfare System Center Pacific (SSC : San Diego, CA	12.721	0.920	Dec 2021	0.000		0.000		-		0.000	0.000	13.641	-
Subtotal			24.199	2.270		0.000		0.000		-		0.000	0.000	26.469	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	MIPR	PMS-485 Maritime Surveillance Systems, SSCPAC : San Diego, CA	1.897	0.413	Nov 2021	0.000		0.000		-		0.000	0.000	2.310	-
Subtotal			1.897	0.413		0.000		0.000		-		0.000	0.000	2.310	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	MIPR	PMS-485 Maritime Surveillance Systems, SSCPAC : San Diego, CA	2.592	0.947	Oct 2021	0.000		0.000		-		0.000	0.000	3.539	-
Subtotal			2.592	0.947		0.000		0.000		-		0.000	0.000	3.539	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023						
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech					Project (Number/Name) 3422 / SHARC Surface Platform							
					Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals					28.688	3.630		0.000		0.000		-		0.000	0.000	32.318	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																								Date: March 2023				
Appropriation/Budget Activity 1319 / 4												R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech								Project (Number/Name) 3422 / SHARC Surface Platform								
Proj 3422	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
SHARC technology demonstration																												
Purchase COTS SHARC platforms																												
Build/ Assemble/Integrate Phase/Lab Test																												
Test and Evaluation, Prototype Ops																												
Program Management																												
Transition and associate program office of record.																												
2024DON - 0603382N - 3422																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech	Project (Number/Name) 3422 / SHARC Surface Platform

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3422				
SHARC technology demonstration: Test and Evaluation, Prototype Ops: Test and Evaluation, Prototype Ops	2	2022	4	2022
SHARC technology demonstration: Program Management: Program Management	1	2022	4	2022
SHARC technology demonstration: Transition and associate program office of record.: Transition and program office of record.	3	2022	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603382N / <i>Advanced Combat Systems Tech</i>				Project (Number/Name) 3423 / <i>LOCUST</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3423: <i>LOCUST</i>	6.886	3.270	40.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	50.156
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Low-Cost UAV Swarming Technology (LOCUST) demonstration is part of the Department of Defense (DOD) Third Offset Strategy as one element in the Effector Grid category for small autonomous systems. LOCUST leverages the BA-3 Innovative Naval Prototype program developing and demonstrating swarming technology. The BA-3 effort is developing both the air vehicle, UAS swarming behaviors, and miniaturized sensor systems. ONR has demonstrated an autonomous system capable of launching 33 UASs in 40 seconds and flying them in a coordinated swarm. This BA-4 effort is trailing the BA-3 demonstration of technologies by a fiscal quarter and then demonstrating the technology in operationally relevant environments with military mission applications. To achieve the ability to operate in relevant environments with military applications, LOCUST is ruggedizing the air platform to survive extended deployments in high shock and vibration environments while in the launchers as well as in-flight for adverse electromagnetic and weather conditions. Significant additional effort is being done to integrate the air platform, command and control, and launchers into and onto several different manned and unmanned host platforms for mission deployment. Scale-up considerations for manufacturing and supply-chain assurance/vulnerability are being pursued.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Low-Cost Uav Swarming Technology (LOCUST)	3.270	40.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: This Project focuses on demonstration of mixed-initiative UAV swarming behaviors, enabling the development of payload appropriate CONOPS/TTPs for Many Vehicle/Many Salvo swarms, and provides unmanned system capability to degrade threat Integrated Air Defense Systems (IADS) in support of follow-on manned system operations.					
FY 2023 Plans: Complete the LOCUST INP and transition it to a program office to support combatant commander requirements. Funds will support pre-production activities, purchase of operational test assets, and engineering services, with FY 2023 funds added for Advanced Concept of Operations.					
Complete test planning and component safety qualification and testing. Provide test support.					
Complete program management and technical oversight of contractor fabrication efforts and production					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603382N / <i>Advanced Combat Systems Tech</i>		Project (Number/Name) 3423 / <i>LOCUST</i>	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>readiness. Provide management of testing and qualifications. Execute contract actions.</p> <p><i>FY 2024 Base Plans:</i> N/A</p> <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> The Decrease from FY 2023 to FY 2024 is due the completion in FY 2023 of the LOCUST INP.</p>					
Accomplishments/Planned Programs Subtotals	3.270	40.000	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTEN/0602792N/3423: <i>LOCUST</i>	8.031	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	28.807
• RDTEN/0603801N/3423: <i>LOCUST</i>	3.386	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.570
Remarks											
<p>D. Acquisition Strategy</p> <p>There are multiple phases for this non-acquisition project.</p> <p>Phase 1 - Marine Corps Warfighting Laboratory (MCWL) Air Combat Element (ACE) will lead the Phase I effort in FY 2018 & FY 2019. MCWL will procure additional launchers, LOCUST platforms and payloads. MCWL will work with the Common Launch Tube Program of Record to procure the multiple missile Common Launch Tube. MCWL will task NAWC AD to help integrate the launcher system onto the MV-22 and support flight test and flight certification. MCWL will use a supporting Warfare Center to integrate the launcher onto a Marine Corps Polaris Corporation M-RZR vehicle or M-RZR trailer. MCWL ACE will closely coordinate with the BA-3 LOCUST program manager to procure the new 6" diameter, additive manufactured, air frame (purchase through BA-3 activity contract). MCWL Experimental Division will define CONOPS/TTPs, the experimental parameters and measures of effectiveness, and operational experiments suitable to apply the capability in a relevant operational environment to evaluate the military utility of the system to a small Marine Corps maneuver element. The Center for Naval Analysis will consolidate the post demonstration report for the systems military utility.</p> <p>Phase II -ONR execute a multi-domain swarm effort in FY 2020-2023 to demonstrate the advantages of small swarming UAVs against adversary defenses. ONR will work with the Naval Warfare Development Center (NWDC) to develop CONOPS / TTPs for this mission capability and fleet experimentation. NSWC Panama City Division (NSWC PCD) will provide operational and logistics support for the launch and recovery of the vehicles. Initiation of Phase II in FY2020 intentionally follows the</p>											

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / <i>Advanced Combat Systems Tech</i>	Project (Number/Name) 3423 / <i>LOCUST</i>
<p>6.3 INP by two fiscal years to allow the INP to develop and mature the miniaturized payloads required for an operational demo. Additionally, close coordination and involvement with acquisition community through these NWDC events and well as simulation exercises and the objective experiments and demonstrations is being done to shape requirements and budget submissions</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603382N / <i>Advanced Combat Systems Tech</i>				Project (Number/Name) 3423 / <i>LOCUST</i>					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Multi-Rotor Platform Procur	MIPR	NRL : Wash, DC	0.013	0.000		0.000		0.000		-		0.000	0.000	0.013	-
Multi-Rotor Platform Payload	MIPR	MITRE : Mclean, VA	0.350	0.000		0.000		0.000		-		0.000	0.000	0.350	-
Payload Procurement	C/CPFF	Raytheon : Tucson, AZ	1.104	0.800	Nov 2021	0.000		0.000		-		0.000	0.000	1.904	-
Multi-Rotor Tests	MIPR	NSWC : Indian Head, MD	0.025	0.000		0.000		0.000		-		0.000	0.000	0.025	-
Fixed-Wing Procurement	C/CPFF	Raytheon : Tuxson, AZ	2.085	2.070	Nov 2021	0.000		0.000		-		0.000	0.000	4.155	-
Platform Specific Launcher Development	Various	Various : Various	1.201	0.000		0.000		0.000		-		0.000	0.000	1.201	-
Command and Control Integration	Various	Various : Various	0.560	0.000		0.000		0.000		-		0.000	0.000	0.560	-
Fixed Wing Tests	Various	Various : Various	1.288	0.300	Nov 2021	0.000		0.000		-		0.000	0.000	1.588	-
All Up Round Hardware	C/CPFF	Raytheon : Tucson, AZ	0.000	0.000		9.500	Apr 2024	0.000		-		0.000	0.000	9.500	-
Production Line Planning and Support	C/CPFF	Raytheon : Tucson, AZ	0.000	0.000		13.000	Jun 2023	0.000		-		0.000	0.000	13.000	-
Engineering Services and Readiness Support Planning	C/CPFF	Raytheon : Tucson, AZ	0.000	0.000		11.500	Jun 2023	0.000		-		0.000	0.000	11.500	-
Subtotal			6.626	3.170		34.000		0.000		-		0.000	0.000	43.796	N/A
Remarks Complete the LOCUST INP and transition it to a program office to support combatant commander requirements. Funds will support pre-production activities, purchase of operational test assets, and engineering services, with FY2023 funds added for Advanced Concept of Operations.															

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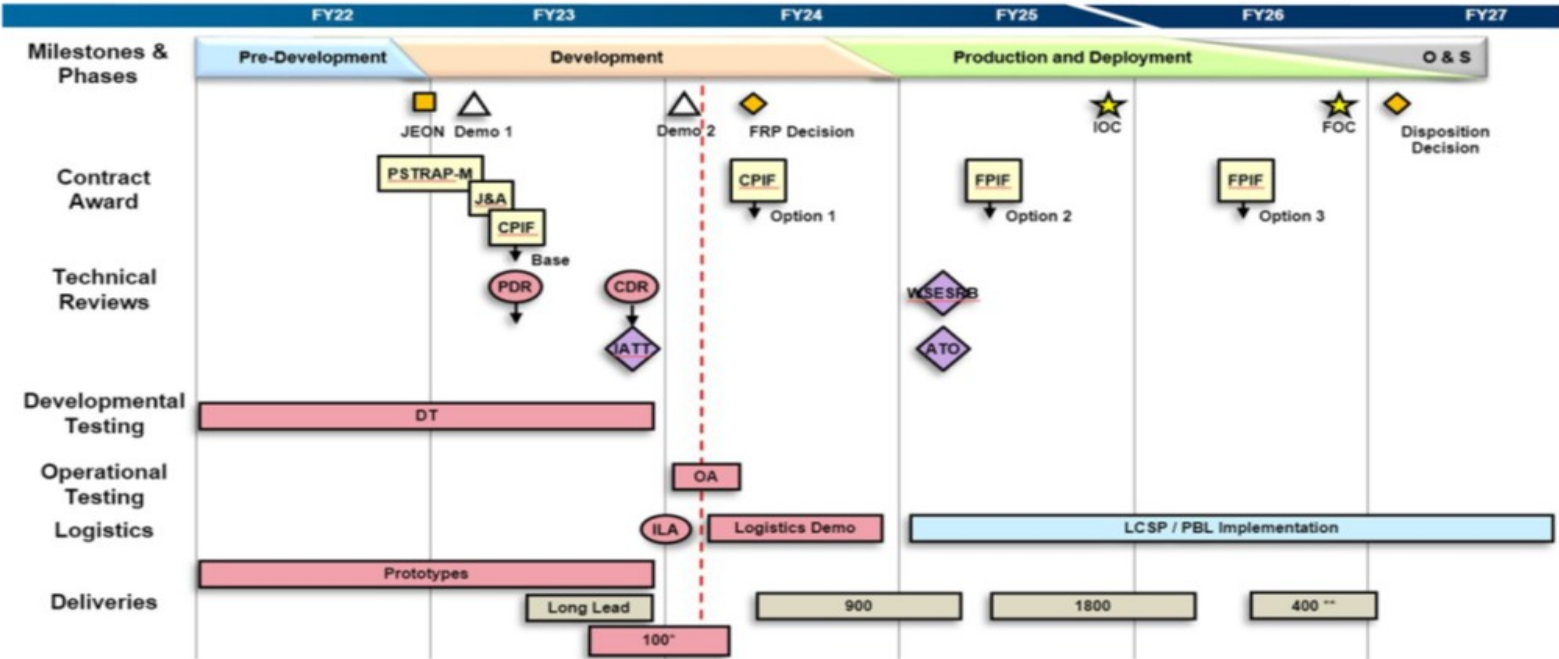
Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech				Project (Number/Name) 3423 / LOCUST					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	Various	Not Specified : Not Specified	0.000	0.000		1.200	May 2023	0.000		-		0.000	0.000	1.200	-
Developmental Test & Evaluation (DT&E)	MIPR	NSWC Indian Head : Not Specified	0.000	0.000		1.800	Mar 2023	0.000		-		0.000	0.000	1.800	-
Subtotal			0.000	0.000		3.000		0.000		-		0.000	0.000	3.000	N/A
Remarks															
NSWC Indian Head \$1,000K - System Safety T&E NSWC Indian Head \$800K - T&E Planning and Execution															
Perform test planning and component safety qualification and testing. Provide test support.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management	TBD	Not Specified : Not Specified	0.260	0.100	Nov 2021	0.000		0.000		-		0.000	0.000	0.360	-
Project management	MIPR	PMS340 : Not Specified	0.000	0.000		3.000	Mar 2023	0.000		-		0.000	0.000	3.000	-
Subtotal			0.260	0.100		3.000		0.000		-		0.000	0.000	3.360	N/A
Remarks															
Provide program management and technical oversight of contractor fabrication efforts and production readiness. Provide management of testing and qualifications. Execute contract actions.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			6.886	3.270		40.000		0.000		-		0.000	0.000	50.156	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																							Date: March 2023					
Appropriation/Budget Activity 1319 / 4											R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech								Project (Number/Name) 3423 / LOCUST									
Proj 3423	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
LOCUST Systems Demonstration - Phase I																												
LOCUST Systems Demonstration - Phase II																												
Procure Coyote, Launcher and Payloads																												
Coyote, Launcher and Payloads Integration																												
Conduct Experiment																												
Assess technical performance and operational utility																												
Support CONOPS/TTP refinement and transition through User Operational Evaluation System delivery																												
2024DON - 0603382N - 3423																												

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech	Project (Number/Name) 3423 / LOCUST

PE 0603382N / Advanced Combat Systems Tech, 3423 Locust – Schedule



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603382N / <i>Advanced Combat Systems Tech</i>		Project (Number/Name) 3423 / <i>LOCUST</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3423				
LOCUST Systems Demonstration - Phase II: Procure Coyote, Launcher and Payloads: Procure Coyote, Launcher and Payloads	1	2022	4	2022
LOCUST Systems Demonstration - Phase II: Coyote, Launcher and Payloads Integration: Coyote, Launcher and Payloads Integration	3	2022	4	2022
LOCUST Systems Demonstration - Phase II: Conduct Experiment: Conduct Experiment	3	2022	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech				Project (Number/Name) 3437 / EMW/SEWIP/SSEE Accelerator			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3437: EMW/SEWIP/SSEE Accelerator	58.104	17.740	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	75.844
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Electromagnetic Maneuver Warfare/Surface Electronic Warfare Improvement Program/Ship's Signals Exploitation Equipment (EMW/SEWIP/SSEE) Accelerator is part of the Department of Defense Third Offset Strategy to improve real time Electro-Magnetic Maneuver Warfare operations. EMW/SEWIP/SSEE Accelerator leverages the S&T Budget Activity (BA)-3 Electro-Magnetic Maneuver Warfare technology developments specifically in cross platform operations. The BA-3 effort is developing high speed sensor and electro-magnetic networking, real time spectrum operations and passive targeting technologies. ONR has demonstrated elements of next generation networking, passive tracking, and cross platform combat system coordination. This BA-4 effort is trailing the BA-3 demonstration of technologies deploying and demonstrating the technology in operationally relevant environments with military mission applications. The deployment will allow the ONR to significantly reduce risk, incorporate early warfighter improvements and test with real world data and scenarios.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: EMW/SEWIP/SSEE Accelerator	17.740	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: EMW/SEWIP/SSEE accelerator builds off of two BA-3 efforts: Surface platform arrays, radios and control software were developed under the Multi-Link CDL System Future Naval Capability and airborne relay were developed within the High Altitude Relay and Routing Future Naval Capability. To date ONR has demonstrated 4-beam CDL surface arrays, radios and controls via land based motion simulators, while the airborne relay functionality has been demonstrated on a P-3 platform in a relevant environment.					
FY 2023 Plans: N/A					
FY 2024 Base Plans: N/A					
FY 2024 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	17.740	0.000	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech	Project (Number/Name) 3437 / EMW/SEWIP/SSEE Accelerator
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy Projects identified for execution under this project number are non-acquisition programs. Each project will develop a project plan to support project execution. Project plans will include a project schedule and technical requirements and objectives to measure project performance. Based on prior BA-3 work prototype contracts are in place and can be used to develop hardware for at sea trials. Software and ship installation are expected to use a combination of existing shipyard contracts and government field activities.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech				Project (Number/Name) 3437 / EMW/SEWIP/SSEE Accelerator					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prototype Development	MIPR	NSWC : various	30.462	2.630	Oct 2021	0.000		0.000		-		0.000	0.000	33.092	-
Prototype Development	PO	NAWC : various	16.107	3.761	Oct 2021	0.000		0.000		-		0.000	0.000	19.868	-
Prototype Development	MIPR	SUPSHIP : Bath Maine	5.267	0.874	Oct 2021	0.000		0.000		-		0.000	0.000	6.141	-
Prototype Development	MIPR	NRL : Washington, DC	6.268	2.624	Oct 2021	0.000		0.000		-		0.000	0.000	8.892	-
Prototype Development	C/CPFF	Vectrus and BAE : various	0.000	3.916	Oct 2021	0.000		0.000		-		0.000	0.000	3.916	-
Prototype Demonstration	C/CPFF	LEIDOS : various	0.000	3.935	Oct 2021	0.000		0.000		-		0.000	0.000	3.935	-
Subtotal			58.104	17.740		0.000		0.000		-		0.000	0.000	75.844	N/A
Remarks															
NSWC: Prototype development of shipboard next generation networking apertures and EMW cross platform software.															
NAWC: Prototype development of airborne next generation apertures and networking software.															
SUPSHIP: Installation and testing of Cross platform EMW accelerator prototype on 2 Navy test vessels.															
NRL: Installation and testing of Cross platform EMW accelerator prototype on Navy maritime patrol aircraft.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			58.104	17.740		0.000		0.000		-		0.000	0.000	75.844	N/A
Remarks															

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PE 0603382N: *Advanced Combat Systems Tech*
Navy

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R-1 Program Element (Number/Name)	Program Element Description	Program Element Type	Program Element Status	Program Element Location	Program Element Contact	Program Element Date	Program Element Comments

PE 0603382N / Advanced Combat Systems
Tech

3437 / EMW/SEWIP/SSEE Accelerator

[illegible]

2024DON - 0603382N - 3437

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech	Project (Number/Name) 3437 / EMW/SEWIP/SSEE Accelerator

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3437				
EMW/SEWIP/SSEE Accelerator: Airborne Testing: Airborne Testing	1	2022	4	2022
EMW/SEWIP/SSEE Accelerator: DDG - Test & Integrate: DDG - Test & Integrate	1	2022	4	2022
EMW/SEWIP/SSEE Accelerator: Virtual Twin Distributive Combat System: Virtual Twin Distributive Combat System	1	2022	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603382N / <i>Advanced Combat Systems Tech</i>				Project (Number/Name) 9999 / <i>Congressional Adds</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	0.000	2.896	14.500	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	17.396
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification
Congressional Interest Items not included in other Projects.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023
<i>Congressional Add:</i> Minotaur data dissemination and interoperability	2.896	6.500
<i>FY 2022 Accomplishments:</i> Conduct Minotaur data dissemination and interoperability.		
<i>FY 2023 Plans:</i> The development of Minimum Viable Product (MVP) using the Business of Innovation for Tri-service Integration and Test (I&T) support efforts, systems and software engineering, technical, and programmatic requirements. Develop and use R&D DevSecOps Environment to leverage USCG USMC Lab infrastructure.		
<i>Congressional Add:</i> Force-level dynamic interoperable C2	0.000	8.000
<i>FY 2022 Accomplishments:</i> N/A		
<i>FY 2023 Plans:</i> Conduct Force-level dynamic interoperable C2 research		
Congressional Adds Subtotals	2.896	14.500

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech						Project (Number/Name) 9999 / Congressional Adds			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
TBD	TBD	TBD : TBD	0.000	2.896	Sep 2022	14.500	Sep 2023	0.000		-		0.000	0.000	17.396	-
Subtotal			0.000	2.896		14.500		0.000		-		0.000	0.000	17.396	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	2.896		14.500		0.000		-		0.000	0.000	17.396	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																Date: March 2023												
Appropriation/Budget Activity 1319 / 4												R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech								Project (Number/Name) 9999 / Congressional Adds								
Minotaur data dissemination and interoperability	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Minotaur data dissemination and interoperability																												
Minotaur data dissemination and interoperability advanced component development																												
2024DON - 0603382N - 9999																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603382N / Advanced Combat Systems Tech	Project (Number/Name) 9999 / Congressional Adds

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Minotaur data dissemination and interoperability				
Minotaur data dissemination and interoperability: Minotaur data dissemination and interoperability advanced component development: Component development and demonstration	4	2022	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603502N I Surface & Shallow Water MCM							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	283.267	51.637	87.746	34.690	-	34.690	25.998	26.294	27.374	27.975	Continuing	Continuing
1234: Unmanned Surface Vehicle (USV)	179.895	19.637	24.887	14.463	-	14.463	16.898	19.481	19.041	19.371	Continuing	Continuing
2989: Barracuda	103.372	32.000	62.859	20.227	-	20.227	9.100	6.813	8.333	8.604	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element provides resources for development of unmanned mine countermeasures systems to provide minehunting, minesweeping, and mine neutralization to counter known and projected mine threats. The mine countermeasures systems provide mobile, quick reaction forces capable of land-based or sea-based minehunting and minesweeping operations worldwide. Resources are for developing and deploying advanced minehunting and minesweeping systems and the intelligence and oceanographic capabilities that will enable mine warfare superiority. Tactics and techniques used vary across a diversity of environments and a diversity of threats, including both asymmetric and emerging. Resources provide for systems and support of mine warfare systems, maritime systems, and expeditionary systems to allow for continuous operations of the Navy's warships and support vessels, other military vessels, and commercial vessels. Core capabilities include forward presence, deterrence, sea control, power projection, maritime security, humanitarian assistance and disaster response to maintain freedom of the seas. Increased capability includes conducting minefield reconnaissance (mine density and location) at high area search rates, improving detection capability; decreasing sensor false alarm rates; reducing or eliminating post-mission analysis detect, classify, identify, decide time; improving neutralization time; improving network communications; automatic target recognition; and achieving in-stride detect-to-engage capability. Concept of operations includes development of cooperative, unmanned, modular systems; the establishment of a capable networked command and control system; and standing up an accurate and interactive environmental system with the ability to form and disseminate a Common Environmental Picture. Efforts benefit the Mine Countermeasure (MCM) force by transforming the Navy from the platform-centered legacy set of systems to a capability-centered force that is distributed, networked, and able to provide unique maritime influence and access across the entire maritime domain.

The Surface and Shallow Water MCM systems consist of two programs: The USV program develops: (1) unmanned surface minehunting capability USVs designed to integrate MCM systems employed by the Littoral Combat Ship (LCS) Class and other vessels of opportunity (VOO) platforms and (2) the integration and improvement of new and existing MCM capabilities and payloads (Minesweeping Payload Deployment System [PDS] , Minehunting PDS, and Mine Neutralization PDS) to provide detection, classification, localization, identification, neutralization, and influence clearance capabilities.

The Barracuda system is an expendable, modular, mine neutralizer launched from the Mine Countermeasures (MCM) Unmanned Surface Vessel (USV) as part of the Littoral Combat Ship (LCS) MCM Mission Package (MP) to autonomously reacquire and neutralize previously detected near-surface mines. Upon entering the water, the vehicle will conduct a search, capture an image, and use a communications buoy to send the image to the operator in the MCM MP to evaluate the image and order the weapon to fire, abort, or continue searching. Future capabilities may include launch from manned or unmanned aircraft or vessels of opportunity as well as the ability to neutralize mines in volume and on the bottom.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0603502N / Surface & Shallow Water MCM			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	53.327	87.825	63.558	-	63.558
Current President's Budget	51.637	87.746	34.690	-	34.690
Total Adjustments	-1.690	-0.079	-28.868	-	-28.868
• Congressional General Reductions	-	-0.079			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.690	0.000			
• Program Adjustments	0.000	0.000	-34.459	-	-34.459
• Rate/Misc Adjustments	0.000	0.000	5.591	-	5.591
Change Summary Explanation					
FY 2022: reduced by \$1,690K for SBIR assessments					
FY 2023: N/A					
FY 2024: reduced by \$28,868 for delayed Barracuda EDM delivery -\$34,459K and increased by \$5,220K for Barracuda Critical Test and misc. rate adjustments of \$371K.					
Technical: Not applicable.					
Schedule: Not applicable.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603502N / Surface & Shallow Water MCM				Project (Number/Name) 1234 / Unmanned Surface Vehicle (USV)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
1234: Unmanned Surface Vehicle (USV)	179.895	19.637	24.887	14.463	-	14.463	16.898	19.481	19.041	19.371	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

In FY20, the UISS program was subsumed into the MCM USV program.

A. Mission Description and Budget Item Justification

The MCM USV program consists of Unmanned Surface Vehicles (USVs) with Mine Countermeasures (MCM) payloads. The program began as the Unmanned Influence Sweep System (UISS) program which consisted of a USV paired with a magnetic and acoustic sweep capability. As the USV progressed, the Navy modified the program so the craft would integrated

and operate other payloads. The UISS program has been subsumed by the MCM USV program.

The program consists of four products:

- 1) The MCM USV is a semi-autonomous dual drive, 38 foot long, 10 foot wide aluminum hulled craft powered by two diesel engines. The craft contains a situational awareness and contact avoidance suite consisting of optical, radar, and GPS and is directed and monitored by the Multi Vehicle Communication System (MVCS) with a host station, such as LCS, Vessel of Opportunity (VOO), or shore site. The reconfigurable payload pay adds a modular mission capability enabling multiple payloads (mine sweep, mine hunt, mine neutralization).
- 2) The Mine Sweep Payload Delivery System (PDS) brings magnetic and acoustic mine influence sweep capability to the MCM USV. The PDS includes a winch, a magnetic sweep cable, and a Towed Acoustic Generator (TAG) along with capability to deploy and retrieve the towed equipment.
- 3) The Mine Hunt PDS brings a mine hunting capability by integrating the existing AN/AQS-20 on to the craft. The PDS includes a winch, cable and tow body handling equipment.
- 4) The Mine Neutralization PDS will neutralize mines previously identified throughout the water column using the Barracuda Mine Neutralizer. The PDS will consist of a launcher and communications gear to communicate with the neutralizer in the water.

The program completed IOT&E in FY21, and declared Initial Operational Capability in Q1FY22. Ship-based TECHEVAL and IOT&E completed in FY22. The UISS program reduced funding for Mine Neutralization Payload development prioritizing the completion of Minesweeping and Minehunting capabilities. In FY23, working with ONR, the MCM USV program will begin integration of a next generation Influence Sweep Payload (Magnetic & Acoustic Generation Next Unmanned Superconducting Sweep - MAGNUSS). Mine Neutralization payload design activities and Engineering Development Model (EDM) will start in FY26.

The MCM USV program will have a continuing reliability, autonomy and cyber-security engineering changes process. The program has developed improvements to address IOT&E findings. Leveraging ongoing developments for autonomous systems, the program will continue to develop performance improvements. Upgrades will consist of processing and sensing hardware, autonomy and situational awareness/collision avoidance algorithms. Engineering Change Proposals (ECPs) will be

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / Surface & Shallow Water MCM	Project (Number/Name) 1234 / Unmanned Surface Vehicle (USV)				
delivered in blocks over a two year cycle. Cybersecurity ECPs will be developed, tested, and released twice a year starting in FY23. MCM USV will continue to support Navy experimentation of Beyond Line of Sight (BLOS) and alternative payloads.						
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: MCM USV Product Development		12.922	16.661	6.632	0.000	6.632
Articles:		-	-	-	-	-
FY 2023 Plans:						
<ul style="list-style-type: none">- Commence USV Advance Autonomy Development effort- Complete Top-Level Requirements for Barracuda effort.- Continue requirements definition of Mine Neutralization (Barracuda) payload and integration with MCM USV.- Commence integration planning of the next generation Influence Sweep Payload, Magnetic and Acoustic Generation Next Unmanned Superconducting Sweep (MAGNUSS)onto the MCM USV- Next Unmanned Superconducting Sweep (MAGNUSS) onto the MCM USV- Beyond Line of Sight communication testing.						
FY 2024 Base Plans:						
<ul style="list-style-type: none">- Continue integration planning of the MAGNUSS payload on the MCM USV- Commence integration of new lower controller to facilitate an open autonomy system architecture for the MCM USV.- Integrate upgraded perception and situational suite into MCM USV.						
FY 2024 OCO Plans:						
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement:						
Decrease delayed integration of Barracuda payload on the MCM USV.						
Title: MCM USV Support		3.256	7.455	4.521	0.000	4.521
Articles:		-	-	-	-	-
FY 2023 Plans:						
<ul style="list-style-type: none">- Execute performance, autonomy, and cybersecurity improvement process for ECPs.- Design and deliver hardware improvements for ECPs.- Develop preliminary software build plan for ECPs.- Develop, test, and release Cybersecurity ECPs.- Develop, test and release reliability ECPs.- Develop Maintainability enhancements ECPs						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603502N / Surface & Shallow Water MCM		Project (Number/Name) 1234 / Unmanned Surface Vehicle (USV)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div>- Develop Maintainability enhancements ECPs</div> <div>FY 2024 Base Plans: - Continue its yearly development cycle to maintain the MCM USV Cybersecurity posture and compliance with updated requirements and instructions. - Incorporate ECP to introduce early MCM USV autonomy capability based on initial Fleet deployment feedback.</div> <div>FY 2024 OCO Plans: N/A</div> <div>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease reflects FY23 focus on implementing ECPs and in FY2024 the program will maintain the MCM USV Cybersecurity posture.</div>						
<div>Title: MCM USV Test and Evaluation</div> <div>Articles:</div> <div>FY 2023 Plans: - Conduct integration related test analysis and reporting. Address findings from Minehunt TECHEVAL and IOT&E as well as MCM MP testing.</div> <div>FY 2024 Base Plans: - Conduct initial on-water testing of various autonomy engines installed on MCM USV, including range time and support craft requirements.</div> <div>FY 2024 OCO Plans: N/A</div> <div>FY 2023 to FY 2024 Increase/Decrease Statement: Increase supports autonomy on-water testing.</div>		3.313 -	0.625 -	3.064 -	0.000 -	3.064 -
<div>Title: MCM USV Management Services</div> <div>Articles:</div> <div>FY 2023 Plans: - Provide program planning, management and acquisition document updates for the MCM USV program. - Manage payload development contract and options.</div> <div>FY 2024 Base Plans:</div>		0.146 -	0.146 -	0.246 -	0.000 -	0.246 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy								Date: March 2023				
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603502N / Surface & Shallow Water MCM				Project (Number/Name) 1234 / Unmanned Surface Vehicle (USV)				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Provide program planning, management and acquisition document updates for the MCM USV program. - Manage payload development contract and options.												
FY 2024 OCO Plans: N/A												
FY 2023 to FY 2024 Increase/Decrease Statement: No significant change.												
Accomplishments/Planned Programs Subtotals								19.637	24.887	14.463	0.000	14.463
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
• OPN/1601: LCS MCM Mission Modules	30.119	92.495	93.961	-	93.961	122.654	103.972	59.906	61.344	1,508.277	2,664.640	
Remarks												
RDT&E/0603596N - Funding shown only reflects funding for required USV development efforts.												
OPN/1601 - The above funding line accounts for several programs, of which the Unmanned Surface Vehicle programs are only a portion.												
OPN/2622 - The above funding line accounts for several programs, of which the Unmanned Surface Vehicle programs are only a portion.												
D. Acquisition Strategy												
UISS - Requirements are documented in the Unmanned Influence Sweep System (UISS) Capability Production Document (CPD). An Engineering and Manufacturing Development (E&MD) contract was awarded in FY14 with options for Low Rate Initial Production (LRIP) in FY19.												
In FY20, Mine Countermeasure Unmanned Surface Vehicle (MCM USV) awarded three LRIP craft with sweep payload, following a Milestone C Decision on development contract.												
In FY20-21, MCM USV developed a Capability Production Document (CPD) Annex leveraging existing requirements (UISS, AN/AQS-20, MCM MP, etc.).												
In FY21, MCM USV craft and Minesweep Payload completed IOT&E testing, validating technical data package for production. Program transitioned from concept development to mine neutralization initial requirements definition and design. Based on demonstrated performance improvements, a fourth UISS LRIP was authorized and procured.												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / <i>Surface & Shallow Water MCM</i>	Project (Number/Name) 1234 / <i>Unmanned Surface Vehicle (USV)</i>
<p>In FY22, MCM USV completed IOT&E for Minehunt Payload (with AN/AQS-20C). Continued requirements definition of the mine neutralization payload. Minehunt Payload LRIP/s will be procured to support MP requirements. A five-year MCM USV production contract was awarded to Bollinger Shipyards LLC (Lockport, LA).</p> <p>In FY23, MCM USV will continue mine neutralization payload requirements definition. In FY23, working with ONR, the MCM USV program will begin integration of the next generation Influence Sweep Payload (Magnetic & Acoustic Generation Next Unmanned Superconducting Sweep - MAGNUSS). Support testing of Beyond Line of Sight (BLOS) communications solution.</p> <p>In FY24, Minesweeping PDS and Minehunting PDS production will be procured under the Multiple Award Contracts (MAC) Indefinite Delivery Indefinite Quantity (IDIQ) USV Family of Systems (FoS) Contract.</p> <p>In FY26, the program will start Mine Neutralization Engineering Design Model design, fabrication and integration onto the craft. Commence MAGNUSS EDM payload integration with USV craft.</p> <p>In FY27, continue MAGNUSS integration actives, which includes an At-Sea Demonstration.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603502N / Surface & Shallow Water MCM						Project (Number/Name) 1234 / Unmanned Surface Vehicle (USV)			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
UISS: Product Development	C/CPIF	Textron Systems, Inc : Hunt Valley, MD	33.145	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MHU: Product Development	SS/CPFF	JHU APL : Laurel, MD	12.215	0.000		0.000		0.000		-		0.000	0.000	12.215	-
MHU: Product Development	C/FPIF	Textron Systems, Inc : Hunt Valley, MD	7.545	0.000		0.000		0.000		-		0.000	0.000	7.545	-
MHU: Product Development	WR	NSWC PC : Panama City, FL	0.922	0.000		0.000		0.000		-		0.000	0.000	0.922	-
MHU: Product Development	WR	NUWC N : Newport, RI	0.740	0.000		0.000		0.000		-		0.000	0.000	0.740	-
MHU: Product Development	WR	NSWC CD : Bethesda, MD	0.235	0.000		0.000		0.000		-		0.000	0.000	0.235	-
MHU: Product Development	WR	Various : Various	0.570	0.000		0.000		0.000		-		0.000	0.000	0.570	-
MCM USV: Product Development 1	C/CPIF	Textron Systems, Inc : Hunt Valley, MD	2.050	0.000		0.000		0.000		-		0.000	0.000	2.050	-
MCM USV: Product Development 2	C/FPIF	Textron Systems, Inc : Hunt Valley, MD	15.559	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MCM USV: Product Development1	C/CPFF	Textron Systems, Inc : Hunt Valley, MD	17.421	1.021	Nov 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MCM USV: Product Development	SS/CPFF	Raytheon : Portsmouth, RI	14.977	0.300	Feb 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MCM USV: Product Development	SS/CPFF	JHU APL : Laurel, MD	3.250	1.235	Feb 2022	1.316	Feb 2023	3.912	Feb 2024	-		3.912	Continuing	Continuing	Continuing
MCM USV: Product Development	WR	NSWC PC : Panama City, FL	8.976	1.652	Nov 2021	3.552	Dec 2022	1.236	Dec 2023	-		1.236	Continuing	Continuing	Continuing
MCM USV: Product Development	WR	NUWC N : Newport, RI	1.991	0.323	Nov 2021	0.078	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing
MCM USV: Product Development	WR	NSWC CD : Bethesda, MD	4.327	0.443	Nov 2021	0.892	Dec 2022	1.484	Dec 2023	-		1.484	Continuing	Continuing	Continuing
MCM USV: Product Development	C/IDIQ	Various : Various	0.000	7.948	Jan 2022	9.881	Jan 2023	0.000		-		0.000	0.000	17.829	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603502N / Surface & Shallow Water MCM				Project (Number/Name) 1234 / Unmanned Surface Vehicle (USV)					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MCM USV: Product Development	WR	NSWC PH : Philadelphia, PA	0.000	0.000		0.899	Oct 2022	0.000		-		0.000	0.000	0.899	-
Subtotal			123.923	12.922		16.618		6.632		-		6.632	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
UISS: Engineering Support	WR	NUWC N : Newport, RI	0.850	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Engineering Support	WR	NSWC PC : Panama City, FL	2.289	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Engineering Support	WR	NSWC CD : Bethesda, MD	1.911	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Engineering Support	C/CPFF	Textron Systems, Inc : Hunt Valley, MD	1.270	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Integrated Logistics	WR	NSWC PC : Panama City, FL	0.665	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Integrated Logistics	WR	NSWC CD : Bethesda, MD	0.951	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Integrated Logistics	C/CPFF	Textron Systems, Inc : Hunt Valley, MD	1.128	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MHU: Engineering Support	WR	SSC PAC : San Diego, CA	0.444	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MHU: Engineering Support	WR	NSWC PC : Panama City, FL	3.460	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MHU: Engineering Support	WR	NUWC N : Newport, RI	0.853	0.000		0.000		0.000		-		0.000	0.000	0.853	-
MHU: Engineering Support	WR	NSWC CD : Bethesda, MD	0.384	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MHU: Engineering Support	WR	Various : Various	0.520	0.000		0.000		0.000		-		0.000	0.000	0.520	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603502N / Surface & Shallow Water
MCM

Project (Number/Name)

1234 / Unmanned Surface Vehicle (USV)

Support (\$ in Millions)

				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MCM USV: Engineering Support	WR	NSWC PC : Panama City, FL	7.916	1.354	Nov 2021	3.149	Dec 2022	0.578	Dec 2023	-		0.578	Continuing	Continuing	Continuing
MCM USV: Engineering Support	WR	NUWC N : Newport, RI	4.113	0.434	Nov 2021	0.230	Dec 2022	0.212	Dec 2023	-		0.212	Continuing	Continuing	Continuing
MCM USV: Engineering Support	WR	NSWC CD : Bethesda, MD	0.935	0.232	Nov 2021	2.597	Dec 2022	0.570	Dec 2023	-		0.570	0.000	4.334	-
MCM USV: Engineering Support	C/CPFF	Textron Systems, Inc : Hunt Valley, MD	1.805	0.423	Nov 2021	1.522	Dec 2022	3.161	Dec 2023	-		3.161	Continuing	Continuing	Continuing
MCM USV: Integrated Logistics	WR	NSWC PC : Panama City, FL	0.161	0.219	Nov 2021	0.000		0.000		-		0.000	0.000	0.380	-
MCM USV: Integrated Logistics	WR	NSWC CD : Bethesda, MD	0.150	0.092	Nov 2021	0.000		0.000		-		0.000	0.000	0.242	-
MCM USV: Integrated Logistics	SS/CPFF	Raytheon : Portsmouth, RI	0.978	0.050	Jan 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MCM USV: Integrated Logistics	SS/CPFF	Northrup Grumman : Annapolis, MD	0.778	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MCM USV: Integrated Logistics	C/CPFF	Textron Systems, Inc : Hunt Valley, MD	2.239	0.452	Dec 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			33.800	3.256		7.498		4.521		-		4.521	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)

				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC PC : Panama City, FL	2.055	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC CD : Bethesda, MD	1.731	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603502N / Surface & Shallow Water MCM				Project (Number/Name) 1234 / Unmanned Surface Vehicle (USV)					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	C/CPIF	Textron Systems, Inc : Hunt Valley, MD	1.884	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	WR	NSWC PC : Panama City, FL	6.015	1.495	Dec 2021	0.343	Dec 2022	3.064	Nov 2023	-		3.064	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	WR	NSWC CD : Bethesda, MD	2.579	0.897	Dec 2021	0.282	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	SS/CPFF	Raytheon : Portsmouth, RI	1.225	0.323	Dec 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	C/CPFF	Textron Systems, Inc : Hunt Valley, MD	3.086	0.598	Dec 2021	0.000		0.000		-		0.000	0.000	3.684	-
Subtotal			18.575	3.313		0.625		3.064		-		3.064	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
UISS: Travel	WR	NAVSEA : Washington, DC	0.295	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
UISS: Management	C/CPAF	TBD : TBD	2.274	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MCM USV: Travel	WR	NAVSEA : Washington, DC	0.389	0.069	Jan 2022	0.055	Jan 2023	0.053	Jan 2024	-		0.053	Continuing	Continuing	Continuing
MCM USV: Management	C/CPAF	TBD : TBD	0.639	0.077	Nov 2021	0.091	Nov 2022	0.193	Jan 2024	-		0.193	Continuing	Continuing	Continuing
Subtotal			3.597	0.146		0.146		0.246		-		0.246	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			179.895	19.637		24.887		14.463		-		14.463	Continuing	Continuing	N/A
Remarks															

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PE 0603502N: *Surface & Shallow Water MCM*
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1234 / Unmanned Surface Vehicle (USV)

MCM

MCM USV		FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
		1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
System Development																													
	Mine Hunt Test & Evaluation				MH IOT&E			MH Cyber Testing																					
	Mine Neutralization Payload Fabrication									FFR																			
	System Integration & Test																												
Advanced Autonomy and MCM Systems																													
Engineering Change Proposals (ECPs)																													
Milestones																													
	Acquisition Milestones																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / Surface & Shallow Water MCM	Project (Number/Name) 1234 / Unmanned Surface Vehicle (USV)	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
MCM USV				
System Development: Mine Hunt Test & Evaluation: Mine Hunt (MCM USV +AQS-20) IOT&E	4	2022	4	2022
System Development: Mine Hunt Test & Evaluation: Mine Hunt Cyber Testing	1	2023	3	2023
System Development: Mine Hunt Test & Evaluation: MH post test Find Fix & Repair	1	2023	4	2024
System Development: Mine Neutralization Payload Fabrication: Barracuda Launcher / Payload Delivery System (PDS) Design	3	2026	2	2028
System Development: Mine Neutralization Payload Fabrication: Barracuda Launcher Fabrication	2	2026	2	2028
System Development: System Integration & Test: MAGNUSS Integration and Deomnstration	1	2023	4	2025
System Development: System Integration & Test: Barracuda Launcher Integration	1	2028	4	2028
System Development: System Integration & Test: Barracuda System Test	1	2028	4	2028
Advanced Autonomy and MCM Systems: Perception/Situational Awareness Improvements	2	2023	1	2024
Advanced Autonomy and MCM Systems: Advanced Autonomy Integration	3	2022	4	2025
Advanced Autonomy and MCM Systems: MCM USV Advanced Autonomy In-Water Test	4	2024	4	2024
Engineering Change Proposals (ECPs): Autonomy/Cyber Improvements (Ongoing)	1	2022	4	2025
Engineering Change Proposals (ECPs): MCM USV Enhancements (Ongoing)	2	2023	4	2025
Milestones: Acquisition Milestones: Minesweeping PDS Full Rate Production	3	2023	3	2023
Milestones: Acquisition Milestones: Minehunting PDS Full Rate Production	4	2023	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603502N / Surface & Shallow Water MCM				Project (Number/Name) 2989 / Barracuda			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2989: Barracuda	103.372	32.000	62.859	20.227	-	20.227	9.100	6.813	8.333	8.604	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

FY 2023 to FY 2024 decrease corresponds with Barracuda Program completion of Critical Design Review and Engineering Development Model fabrication in FY 2023

The Barracuda system is an expendable, modular, mine neutralizer launched from the Mine Countermeasures (MCM) Unmanned Surface Vessel (USV) as part of the Littoral Combat Ship (LCS) MCM Mission Package (MP) to autonomously reacquire and neutralize previously detected near-surface mines. Upon entering the water, the vehicle will conduct a search, capture an image, and use a communications buoy to send the image to the operator in the MCM MP to evaluate the image and order the weapon to fire, abort, or continue searching.

Future capabilities may include launch from manned or unmanned aircraft or vessels of opportunity as well as the ability to neutralize mines in volume and on the bottom.

The Barracuda detailed design and development contract includes system design, program management, systems engineering, software development, integrated product support and contractor testing.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Barracuda: Product Development	28.050	58.661	16.081	0.000	16.081
Articles:	-	-	-	-	-
FY 2023 Plans: - Complete final Critical Design Review for detailed design and initial product baseline. - Develop and award contract option for Barracuda Engineering Development Models (EDMs). - Conduct full vehicle assembly, integration, and checkout of contractor test assets based on the detailed design delivered to the Government at the Critical Design Review. - Commence qualification testing of contractor test assets to verify the detailed design, assembly, and integration of vehicles and support equipment against contract requirements.					
FY 2024 Base Plans: - Continue full vehicle assembly, integration, and checkout of contractor test assets based on the detailed design delivered to the Government at the Critical Design Review. - Continue Engineering Development Model fabrication for planned FY 2025 deliveries.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603502N / Surface & Shallow Water MCM		Project (Number/Name) 2989 / Barracuda		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div>- Continue qualification testing of contractor test assets to verify the detailed design, assembly, and integration of vehicles and support equipment against contract requirements.</div> <div>- Commence performance testing of contractor test assets for initial verification of system performance requirements prior to Government testing.</div> <div>FY 2024 OCO Plans: N/A</div> <div>FY 2023 to FY 2024 Increase/Decrease Statement: FY 2023 to FY 2024 decrease corresponds with program completion of CDR in FY 2023 and Barracuda EDM delivery delay into FY 2025.</div>						
<div>Title: Barracuda: Engineering Support</div> <div>Articles:</div> <div>FY 2023 Plans: - Support final Critical Design Review for approval of detailed design and initial product baseline. - Continue to conduct and manage technical documents, safety reviews, and contractor test plans and reports. - Continue management of contract deliverables and begin transition of system configuration management to the Government. - Continue to coordinate host and deployment platform compatibility and integration efforts.</div> <div>FY 2024 Base Plans: -Continue to conduct and manage technical documents, safety reviews, and contractor test plans and reports. -Continue to coordinate host and deployment platform compatibility and integration efforts. -Provide Government oversight of contractor test asset and Engineering Development Model fabrication. -Provide Government oversight of contractor qualification and performance testing.</div> <div>FY 2024 OCO Plans: N/A</div> <div>FY 2023 to FY 2024 Increase/Decrease Statement: No significant scope changes from FY 2023 to FY 2024.</div>		3.650 -	3.881 -	3.944 -	0.000 -	3.944 -
<div>Title: Barracuda: Management Services</div> <div>Articles:</div> <div>FY 2023 Plans:</div>		0.300 -	0.317 -	0.202 -	0.000 -	0.202 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603502N / <i>Surface & Shallow Water MCM</i>		Project (Number/Name) 2989 / <i>Barracuda</i>		
<u>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</u>						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Continue to provide program management, financial management and engineering support. <i>FY 2024 Base Plans:</i> Continue to provide program management, financial management and engineering support. <i>FY 2024 OCO Plans:</i> N/A <i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> No significant scope changes from FY 2023 to FY 2024.						
Accomplishments/Planned Programs Subtotals		32.000	62.859	20.227	0.000	20.227
<u>C. Other Program Funding Summary (\$ in Millions)</u> N/A						
<u>Remarks</u>						
<u>D. Acquisition Strategy</u> The Barracuda program awarded a competitive contract in FY 2018 to Raytheon Technologies Missiles and Defense (formerly Raytheon Integrated Defense Systems) in Portsmouth, RI. The Barracuda program is developing a semi-autonomous mine neutralization system that will be incorporated in LCS MCM MP. Initial concepts were based on small UUVs developed as part of the ONR Single Sortie, Detect to Engage Future Naval Capabilities project (FY 2015-FY 2018).						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603502N / Surface & Shallow Water MCM				Project (Number/Name) 2989 / Barracuda					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Barracuda Hardware/ Support	C/CPIF	Raytheon (Integrated Defense Systems) : Portsmouth, RI	86.672	28.050	Dec 2021	58.661	Dec 2022	16.081	Dec 2023	-		16.081	Continuing	Continuing	Continuing
Subtotal			86.672	28.050		58.661		16.081		-		16.081	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Barracuda Engineering Support	WR	NUWC NPT : Newport, RI	1.674	0.389	Dec 2021	0.412	Dec 2022	0.413	Dec 2023	-		0.413	0.000	2.888	-
Barracuda Engineering Services	C/CPIF	JHU APL : Baltimore, MD	2.030	0.512	Dec 2021	0.543	Dec 2022	0.481	Dec 2023	-		0.481	0.000	3.566	-
Barracuda Engineering Support	WR	NSWC, PC : Panama City, FL	6.783	2.064	Nov 2021	2.174	Nov 2022	2.541	Nov 2023	-		2.541	0.000	13.562	-
Barracuda Support	WR	NSWC, IHD : Indian Head, MD	3.174	0.310	Nov 2021	0.333	Nov 2022	0.344	Nov 2023	-		0.344	0.000	4.161	-
Barracuda Support	WR	Naval Research Lab : Washington, DC	0.926	0.089	Dec 2021	0.111	Dec 2022	0.055	Dec 2023	-		0.055	0.000	1.181	-
Barracuda Support	WR	NSWC, Carderock : Bethesda, MD	1.069	0.286	Nov 2021	0.308	Nov 2022	0.110	Nov 2023	-		0.110	0.000	1.773	-
Subtotal			15.656	3.650		3.881		3.944		-		3.944	0.000	27.131	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Barracuda Management Support	WR	NSWC, PC : Panama City, FL	1.044	0.300	Nov 2021	0.317	Nov 2022	0.202	Nov 2023	-		0.202	1.674	3.537	-
Subtotal			1.044	0.300		0.317		0.202		-		0.202	1.674	3.537	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023			
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603502N / Surface & Shallow Water MCM					Project (Number/Name) 2989 / Barracuda				
		Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		103.372	32.000		62.859		20.227		-		20.227	Continuing	Continuing	N/A

Remarks

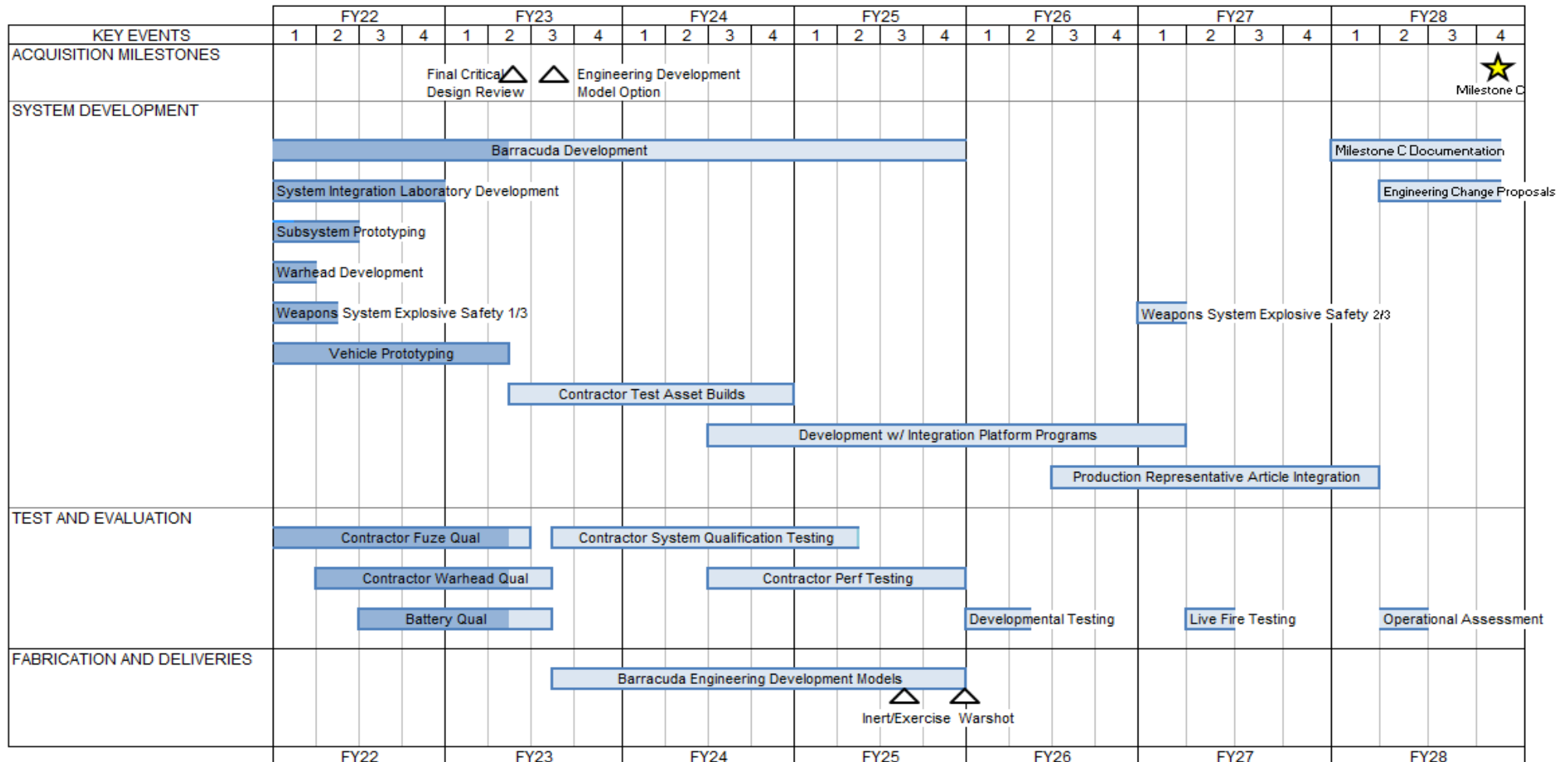
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MCM

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603502N / <i>Surface & Shallow Water MCM</i>	Project (Number/Name) 2989 / <i>Barracuda</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Acquisition Milestones</i>				
Barracuda Acquisition Milestones: Final Critical Design Review	2	2023	2	2023
Barracuda Acquisition Milestones: Engineering Development Models (EDM) Contract Option	3	2023	3	2023
System Development: Barracuda Development	1	2022	4	2025
System Development: Systems Integration Laboratory Development	1	2022	4	2022
System Development: Subsystem Prototyping	1	2022	2	2022
System Development: Warhead Development	1	2022	1	2022
System Development: Weapons Systems Explosive Safety Review Board 1/3	1	2022	2	2022
System Development: Vehicle Prototyping	1	2022	2	2023
System Development: Contractor Test Asset Builds	2	2023	4	2024
System Development: Weapons Systems Explosive Safety Review Board 2/3	1	2027	1	2027
System Development: Development with Integration Platform Programs	3	2024	1	2027
System Development: Production Representative Article Integration	3	2026	1	2028
Test and Evaluation: Contractor Fuze Qualification	1	2022	2	2023
Test and Evaluation: Contractor Warhead Qualification	2	2022	3	2023
Test and Evaluation: Contractor Battery Qualification	3	2022	3	2023
Test and Evaluation: Contractor System Qualification	3	2023	2	2025
Test and Evaluation: Contractor System Performance	3	2024	4	2025
Test and Evaluation: Developmental Testing	1	2026	2	2026
Test and Evaluation: Live Fire Testing	2	2027	2	2027
Test and Evaluation: Operational Assessment	2	2028	2	2028

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603502N / Surface & Shallow Water MCM		Project (Number/Name) 2989 / Barracuda	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
Deliveries: Engineering Development Models (EDMs) Fabrication		3	2023	3	2025
Deliveries: Exercise/Inert Variant EDMs Delivery		3	2025	3	2025
Deliveries: Warshot Variant EDMs Delivery		4	2025	4	2025

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>					R-1 Program Element (Number/Name) PE 0603506N / <i>Surface Ship Torpedo Defense</i>							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	755.458	8.573	0.473	0.730	-	0.730	4.912	6.514	0.494	0.000	0.000	777.154
0225: <i>Surface Ship Torpedo Defense (SSTD)</i>	755.458	1.820	0.473	0.730	-	0.730	4.912	6.514	0.494	0.000	0.000	770.401
9999: <i>Congressional Adds</i>	0.000	6.753	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.753

A. Mission Description and Budget Item Justification

The Surface Ship Torpedo Defense (SSTD) program provides a detect-to-engage layered torpedo defense capability. The four (4) major efforts that comprise SSTD are the AN/SLQ-25 (NIXIE) system, Torpedo Warning System (TWS), the Countermeasure Anti-Torpedo (CAT), and Acoustic Device Countermeasure (Surface ADC MK2).

The ATTDs provides a hard kill torpedo defensive capability on High Value Units (HVU's). The SSTD program has developed and fielded five (5) ATTDs Engineering Design Models (EDMs) systems on CVNs. Each EDM system is one (1) TWS with a load out of a maximum of eight (8) CATs. In FY20, the ATTDs Program commenced sundown efforts to return the five (5) CVNs to their original configuration. Two (2) system removals completed in FY22, with one (1) more scheduled for FY23. FY23 and FY24 funding will provide minimal support to the 2 remaining CVN installations with system preservation the primary focus.

Research and development in torpedo defense of new technologies and capabilities developed under the Future Naval Capabilities (FNC), Small Business and Innovative Research (SBIR), and other Research, Development, Test & Evaluation (RDT&E) initiatives are evaluated to determine their effectiveness and impact on improving ship survivability. Evaluations of new and emerging torpedo defense hardware and software in representative acoustic environments, against projected threats using both digital and hardware-in-the-loop simulations is performed. The AN/SLQ-25 (NIXIE) program has built an ECP package for technical refresh designated as the AN/SLQ-25E. This ECP is a form-fit-function replacement of the AN/ SLQ-25C, which is widely fielded across the surface fleet. The AN/SLQ-25E is more modular, maintainable, and will meet all current and future cybersecurity requirements. The modular and Commercial-Off-The-Shelf (COTS) design of AN/SLQ-25E will allow for future capability growth to outpace the threat in torpedo defense. Two (2) FY22 Congressional adds support research and development of new torpedo defense capabilities specifically on the 25E effort, as well as improve the safety and reliability of the 25E towed winch and reel system.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0603506N I Surface Ship Torpedo Defense			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	8.862	0.473	0.000	-	0.000
Current President's Budget	8.573	0.473	0.730	-	0.730
Total Adjustments	-0.289	0.000	0.730	-	0.730
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.289	0.000			
• Program Adjustments	0.000	0.000	0.718	-	0.718
• Rate/Misc Adjustments	0.000	0.000	0.012	-	0.012
Congressional Add Details (\$ in Millions, and Includes General Reductions)				FY 2022	FY 2023
Project: 9999: Congressional Adds					
Congressional Add: SLQ-25 capability improvements				2.894	0.000
Congressional Add: Surface ship torpedo defense towed decoys				3.859	0.000
Congressional Add Subtotals for Project: 9999				6.753	0.000
Congressional Add Totals for all Projects				6.753	0.000
Change Summary Explanation					
FY2022 SBIR reduction of \$0.289 million. FY2024 program increase by \$0.730 million to support functionality of TWS prior to schedule DEMIL on two (2) CVN platforms. Changes to the program's schedule (R-4 and R-4A) beginning in FY2023, reflect the addition of funding to support program requirements across the FYDP.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603506N / Surface Ship Torpedo Defense				Project (Number/Name) 0225 / Surface Ship Torpedo Defense (SSTD)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0225: Surface Ship Torpedo Defense (SSTD)	755.458	1.820	0.473	0.730	-	0.730	4.912	6.514	0.494	0.000	0.000	770.401
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

ATTDS is a system of systems, comprised of the Torpedo Warning System (TWS) and the Countermeasure Anti-Torpedo Torpedo (CAT). The CAT program developed a canisterized Anti-Torpedo Torpedo (ATT) that provides hard kill torpedo defensive capability for High Value Units (HVUs). The TWS program developed active and passive towed arrays, and electronics processing cabinets to provide Torpedo Detection, Classification, and Localization (TDCL). The SSTD program has developed and fielded five (5) ATTDS Engineering Design Models (EDMs) across five (5) CVNs. Each EDM system is one (1) TWS with a load out of a maximum of eight (8) CATs. In FY20, the ATTDS Program commenced shutdown efforts to return the five (5) CVNs to their original configuration. Two (2) system removals completed in FY22, with one (1) more scheduled for FY23. FY22 fund supports the demilitarization and disposal of sixteen (16) CATs, and FY23 funding will support the demilitarization and disposal of the remaining eight (8) CATs. FY23 and FY24 funding will provide minimal support to the 2 remaining CVN installations with system preservation the primary focus. FY25 through FY27 funding will support completing the removal and disposition of the remaining ATTDS assets.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Countermeasure Anti-Torpedo (CAT) Articles: FY 2023 Plans: - Removal of eight (8) CATs following the final ATTDS deployment - Demilitarization and disposal of remaining eight (8) CAT units at NUWC Keyport, per the CAT Demilitarization/Disposal Plan (9-1356-PLAN-X02). - Execute removal of CAT equipment (SCD 25298) for one (1) CVN. FY 2024 Base Plans: N/A. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: FY2023 to FY2024 decrease of \$0.108 million due to CAT program shutdown.	0.321	0.108	0.000	0.000	0.000
Title: Torpedo Warning System (TWS) Articles:	1.499	0.365	0.730	0.000	0.730

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy								Date: March 2023				
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603506N / Surface Ship Torpedo Defense				Project (Number/Name) 0225 / Surface Ship Torpedo Defense (SSTD)				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
FY 2023 Plans: - TWS system preservation on two (2) CVNs as needed by fleet request. - Execute removal of TWS equipment (SCD 25298) from one (1) CVN. FY 2024 Base Plans: - TWS system preservation on two (2) CVNs as needed by fleet request. - Begin SCD documentation according to ship availability maintenance schedule to process SCD 25298 for the two (2) remaining CVNs. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: FY2023 to FY2024 increase of \$0.365 million due as part of the ATTDS sundown Plan, which now executes its last two (2) DEMILS in FY25 (long lead material and documentation) and FY26 (In Yard Availability Period).												
Accomplishments/Planned Programs Subtotals								1.820	0.473	0.730	0.000	0.730
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
• OPN/2213: Surface Ship Torpedo Def (SSTD)	11.010	14.325	14.560	-	14.560	2.713	2.841	2.868	2.937	Continuing	Continuing	
• WPN/3113: Surface Ship Torpedo Def (SSTD)	4.545	3.789	4.830	-	4.830	4.745	5.531	5.634	5.729	Continuing	Continuing	
Remarks												
OPN/2213 funds the AN/SLQ-25 System. No ATTDS OPN funding in FY20 and out. WPN/3113 funds the Surface Acoustic Device Countermeasure, ADC MK2 Mod 6 and Surface ADC Ready Stowage Lockers. No WPN ATTDS funding in FY20 and out.												
D. Acquisition Strategy												
CAT Program: The Program completed a Systems Requirements Review (SRR) and Preliminary Design Review (PDR) on the Engineering Development Model (EDM) design. ARL Penn State (ARL/PSU) has completed a Technical Data Package (TDP) to support the future system builds. CAT system SALVO Software was operational prior to ATTDS system preservation and is currently in fleet use.												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603506N / Surface Ship Torpedo Defense	Project (Number/Name) 0225 / Surface Ship Torpedo Defense (SSTD)
<p>TWS Program: ULTRA developed and produced five complete sensor sets. Pacific Engineering Incorporated (PEI) and In-Depth Engineering INC. developed the stowage racks and fire control systems respectively. System integration supported fabrication and fielding of the five complete systems. Testing of TWS SALVO software was complete and is currently in Fleet use. ULTRA continues to provide Fleet support for the system.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603506N / Surface Ship Torpedo Defense				Project (Number/Name) 0225 / Surface Ship Torpedo Defense (SSTD)					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NUWC : Newport, RI	59.271	0.100	Nov 2021	0.100	Nov 2022	0.270	Nov 2023	-		0.270	0.000	59.741	Continuing
Systems Engineering ATT Dev.	C/CPFF	PSU/ARL : State College, PA	307.114	0.100	Feb 2022	0.030	Nov 2022	0.000		-		0.000	0.000	307.244	-
Systems Engineering Warhead Dev.	WR	NSWC : Indian Head, MD	82.990	0.274	Nov 2021	0.000		0.042	Nov 2023	-		0.042	0.000	83.306	-
Systems Engineering	WR	NUWC : Keyport, WA	64.554	0.258	Nov 2021	0.080	Nov 2022	0.288	Nov 2023	-		0.288	0.000	65.180	-
Systems Engineering TDCL	C/CPFF	Ultra : Braintree, MA	11.640	0.000		0.000		0.000		-		0.000	0.000	11.640	Continuing
Systems Engineering TDCL	C/CPFF	AAC : Hauppauge, NY	4.480	0.000		0.000		0.000		-		0.000	0.000	4.480	Continuing
Systems Engineering	C/CPFF	ArgonST : Manassas, VA	0.800	0.000		0.000		0.000		-		0.000	0.000	0.800	Continuing
Systems Engineering TDCL	WR	NSWC : Dahlgren, VA	10.032	0.000		0.000		0.000		-		0.000	0.000	10.032	Continuing
Systems Engineering TDCL	WR	SPAWAR : San Diego, CA	11.118	0.000		0.000		0.000		-		0.000	0.000	11.118	Continuing
Systems Engineering	C/CPFF	UT/ARL : Arlington, TX	0.600	0.000		0.000		0.000		-		0.000	0.000	0.600	Continuing
Systems Engineering	C/CPFF	Alion : Bridgeport, CT	14.858	0.000		0.000		0.000		-		0.000	0.000	14.858	Continuing
Systems Engineering	WR	NUWC DET : Norfolk, VA	41.781	0.100	Oct 2021	0.000		0.000		-		0.000	0.000	41.881	-
Systems Development	C/CPFF	Ultra : Braintree, MA	131.119	0.626	Dec 2021	0.207	Dec 2022	0.100	Dec 2023	-		0.100	0.000	132.052	Continuing
Subtotal			740.357	1.458		0.417		0.700		-		0.700	0.000	742.932	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/FFP	EG&G : Gaithersburg, Md.	2.846	0.000		0.000		0.000		-		0.000	0.000	2.846	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603506N / Surface Ship Torpedo Defense						Project (Number/Name) 0225 / Surface Ship Torpedo Defense (SSTD)			
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
DAWDF	Various	Not Specified : Not Specified	0.237	0.000		0.000		0.000		-		0.000	0.000	0.237	Continuing
Program Management Support	C/CPAF	Tech-Marine : Washington, DC	9.930	0.000		0.000		0.000		-		0.000	0.000	9.930	Continuing
Travel	Various	PMS 415 : Not Specified	1.513	0.062	Jan 2022	0.056	Jan 2023	0.030	Jan 2024	-		0.030	0.000	1.661	Continuing
Program Management Support	C/CPFF	SPA : Alexandria, VA	0.575	0.000		0.000		0.000		-		0.000	0.000	0.575	Continuing
Program Management Support	C/CPAF	Synchron : Washington, DC	0.000	0.300	Oct 2021	0.000		0.000		-		0.000	0.000	0.300	-
Subtotal			15.101	0.362		0.056		0.030		-		0.030	0.000	15.549	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			755.458	1.820		0.473		0.730		-		0.730	0.000	758.481	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																Date: March 2023																
Appropriation/Budget Activity 1319 / 4												R-1 Program Element (Number/Name) PE 0603506N / Surface Ship Torpedo Defense				Project (Number/Name) 0225 / Surface Ship Torpedo Defense (SSTD)																
	FY22				FY23				FY24				FY25				FY26				FY27				FY28							
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
CAT	CAT Fleet Support																															
					CAT DEMIL																											
TWS	TWS Fleet Support																															
	TWS DEMIL																TWS DEMIL															
CVN																	CVN68-DECOM															
	CVN69-DEMIL																															
	CVN71-DEMIL																															
					CVN75-DEMIL																											
	CVN77-INSTALL																	CVN77-DEMIL														

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603506N / Surface Ship Torpedo Defense	Project (Number/Name) 0225 / Surface Ship Torpedo Defense (SSTD)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 0225				
CAT - Preservation	1	2022	4	2023
TWS - Preservation	1	2022	2	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603506N / Surface Ship Torpedo Defense				Project (Number/Name) 9999 / Congressional Adds			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: Congressional Adds	0.000	6.753	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.753
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Surface Ship Torpedo Defense (SSTD) provides a layered torpedo defense capability to protect surface ships. The AN/SLQ-25 (NIXIE) is the Navy's primary SSTD program of record, providing persistent towed torpedo countermeasure capability, currently protecting over 180 surface ships.												
Project C750: Congressional Add (\$3.000M) - AN/SLQ-25 Capability improvements to the ongoing technical refresh of the AN/SLQ - Legacy System. \$0.106M realigned for SBIR.												
Project C751: Congressional Add (\$4.000M) - AN/SLQ25 Development of capability. Improvements of the Towed Systems and Towing Systems. \$0.141M realigned for SBIR.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2022	FY 2023			
Congressional Add: SLQ-25 capability improvements								2.894	0.000			
FY 2022 Accomplishments: - Capabilities improvements in the AN/SLQ-25 Tech refresh effort to include software development and hardware development of the electronic packages. Development will also include safety and reliability improvements to the towed winch and reel system. - Integrate capability improvements realized in FY22 into the AN/SLQ-25 Tech refresh effort.												
FY 2023 Plans: N/A												
Congressional Add: Surface ship torpedo defense towed decoys								3.859	0.000			
FY 2022 Accomplishments: - Capabilities improvements to the AN/SLQ-25 Tech refresh effort, to include, technical data package completion, electronics design and development, towed system improvements to include the development of the towed decoy and towing system. - Integrate capability improvements realized in FY22 into the AN/SLQ-25 Tech refresh effort.												
FY 2023 Plans: N/A												
Congressional Adds Subtotals								6.753	0.000			
C. Other Program Funding Summary (\$ in Millions)												
N/A												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603506N / Surface Ship Torpedo Defense	Project (Number/Name) 9999 / Congressional Adds
C. Other Program Funding Summary (\$ in Millions)		
Remarks		
D. Acquisition Strategy		
Single year congressional funding to increase the capability of the AN/SLQ-25 Tow Acoustic System.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603506N / Surface Ship Torpedo Defense				Project (Number/Name) 9999 / Congressional Adds					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
C750 Systems Engineering	Various	NUWC Newport : Newport, RI	0.000	0.100	May 2022	0.000		0.000		-		0.000	0.000	0.100	-
C750 M/S Design and Development	Various	NUWC Newport : Newport, RI	0.000	0.400	May 2022	0.000		0.000		-		0.000	0.000	0.400	-
C750 Systems Development	Various	NUWC Keyport : Keyport, WA	0.000	2.394	May 2022	0.000		0.000		-		0.000	0.000	2.394	-
C751 Systems Engineering	Various	NUWC Keyport : Keyport, WA	0.000	0.600	May 2022	0.000		0.000		-		0.000	0.000	0.600	-
C751 Systems Development - KEYPORT	Various	NUWC Keyport : Keyport, WA	0.000	2.209	May 2022	0.000		0.000		-		0.000	0.000	2.209	-
C751 Systems Development - NEWPORT	Various	NUWC Newport : Newport, RI	0.000	1.050	May 2022	0.000		0.000		-		0.000	0.000	1.050	-
Subtotal			0.000	6.753		0.000		0.000		-		0.000	0.000	6.753	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	6.753		0.000		0.000		-		0.000	0.000	6.753	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy										Date: March 2023			
Appropriation/Budget Activity					R-1 Program Element (Number/Name)					Project (Number/Name)			
1319 / 4					PE 0603506N / Surface Ship Torpedo Defense					9999 / Congressional Adds			

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 9999																												
Congressional Adds: Project C750 SLQ-25 Improvements																												
Congressional Adds: Project C751 SSTD Towed Decoys																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603506N / Surface Ship Torpedo Defense	Project (Number/Name) 9999 / Congressional Adds

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
Congressional Adds: Project C750 SLQ-25 Improvements	3	2022	4	2023
Congressional Adds: Project C751 SSTD Towed Decoys	3	2022	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603512N / Carrier Systems Development							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	96.044	7.109	11.567	6.095	-	6.095	5.797	9.375	10.393	9.438	Continuing	Continuing
3216: Tactical Support Center-Integration	65.990	5.936	8.519	4.954	-	4.954	4.682	4.899	4.977	5.070	Continuing	Continuing
4005: In-Service Carrier Systems Development	30.054	1.173	3.048	1.141	-	1.141	1.115	4.476	5.416	4.368	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element (PE) addresses technology areas associated with Command and Control (C2) of the MH-60R/S Seahawk Helicopter, as well as the development of other technologies and enhancements for Aircraft Carrier-based systems.

PROJECT 3216: The AN/SQQ-34 Aircraft Carrier Tactical Support Center (CV-TSC) program delivers Anti-Submarine Warfare (ASW) and Surface Warfare (SUW) combat capability to the Aircraft Carrier supporting Aircraft Carrier, Nuclear power (CVN) Tactical Action Office (TAO) and embarked Carrier Strike Group (CSG) Sea Combat Commander. This project provides incremental development to deliver frequent capability updates to the Fleet (Fleet Capability Releases (FCR)), developing, testing, certifying, and fielding improved combat capability and critical cyber-security improvements. The project maintains interoperability with current interfaces and develops interoperability with future interfaces; supports mission data exchange; improves ASW/SUW track/sensor processing and analysis techniques; improves mission planning; improves data recording, reconstruction, and distribution; improves embedded simulation and training capabilities; and implements cyber-security measures to effectively employ overall CVN self-defense capabilities. CV-TSC integrates sensor data from organic Aircraft (MH-60R), organic platform sensors and tracks via Ship Self Defense System (SSDS) Product Line Architecture (PLA) and non-PLA, Link-16 track data, Global Command and Control System (GCCS) Over-the-Horizon (OTH) track data, and environmental and threat databases to assess the threat and assist the TAO and CSG to effectively employ overall CVN self-defense capabilities. Current development efforts are focused on extending non-organic ASW/SUW data sources to provide situational awareness and targets beyond the CSG surveillance area. This includes Minotaur Family of Services (MFoS)/Maritime Targeting Cell - Afloat (MTC-A), Integrated Broadcast Service (IBS) and future Resilient Command & Control, Communication (RC3) data links. CV-TSC generates real-time ASW/SUW information and recommendations, tactical planning and employment of ASW/SUW assets, ASW/SUW sensor data processing and analysis, and distribution of tactically significant data. Aircraft supported include the MH-60R/S Seahawk, and P-8 Poseidon and MQ-4C Triton as future ASW/SUW non-organic supporting platforms.

FY 2024 will focus on completing FCR-6 development, to include MFoS integration (with MTC-A and Geospatial Intelligence Unified Naval Streaming System (GUNSS)) and Technology Insertion 16 (TI-16) integration (with next generation Common Processing System (CPS) and Interface Processor System (IPS)), as well as the initiation of FCR-7 planning.

PROJECT 4005: The In-Service Carrier Systems Development Demonstration and Validation Program develops new technology and enhancements to deliver an affordable, robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment. The program provides the system architecture,

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0603512N / Carrier Systems Development			
requirements/specification development, technology selection, software development (including software baseline), manpower requirements, Total Ownership Costs (TOC), cyber-security engineering and integration, as well as land-based and shipboard testing of new technologies to improve shipboard operations.					
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	7.182	11.567	10.085	-	10.085
Current President's Budget	7.109	11.567	6.095	-	6.095
Total Adjustments	-0.073	0.000	-3.990	-	-3.990
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.073	0.000			
• Program Adjustments	0.000	0.000	-4.187	-	-4.187
• Rate/Misc Adjustments	0.000	0.000	0.197	-	0.197
Change Summary Explanation					
FUNDING CHANGES SINCE THE PREVIOUS PRESIDENT'S BUDGET AT THE OVERALL PE LEVEL:					
- FY 2022 decrease of \$-0.073M is the result of the Small Business Innovative Research (SBIR) transfer.					
- FY 2024 decrease of \$-3.990M is the net result of the CV-TSC TI-12 and TI-16 obsolescence increase (\$+0.249M), a reprioritization of CV-TSC Minotaur Family of Services (MFoS) hardware funding (\$-2.200M), a general reprioritization of funding to support Aircraft Carrier Wholeness (\$-2.226M), and the incorporation of miscellaneous rate adjustments (\$+0.187M).					
PROJECT 3216 - FY 2023 TO FY 2024 BUDGET REQUEST DECREASE:					
- FY 2023 (\$8.519M) to FY 2024 (\$4.954M) decrease (\$-3.565M) reflects a reprioritization of funding in FY 2024 for the Minotaur Family of Systems (MFoS) and is consistent with planned program phasing.					
PROJECT 3216 - SCHEDULE CHANGES SINCE THE PREVIOUS PRESIDENT'S BUDGET:					
- Development: A new continuous development pipeline is reflected, replacing individual development events for each FCR to more accurately depict the current development process.					
- FCR-5 and FCR-5A, where FCR-5 was the CVN-79/TI-16 specific engineering release, will now be combined and a single set of certification events will occur in 2Q23 as planned for what was originally FCR-5A. CVN-79/TI-16 delivery is not impacted by this change.					
PROJECT 4005 - FY 2023 TO FY 2024 BUDGET REQUEST DECREASE:					
The FY 2023 (\$3.048M) to FY 2024 (\$1.141M) program decrease (\$-1.907M) reflects a decision to re-align the funding					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603512N / Carrier Systems Development	
reprioritization of CVN efforts to fund Carrier Wholeness.		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603512N / Carrier Systems Development				Project (Number/Name) 3216 / Tactical Support Center-Integration			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3216: Tactical Support Center-Integration	65.990	5.936	8.519	4.954	-	4.954	4.682	4.899	4.977	5.070	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The AN/SQQ-34 Aircraft Carrier Tactical Support Center (CV-TSC) project delivers Anti-Submarine Warfare (ASW) and Surface Warfare (SUW) combat capability to the Aircraft Carrier. This project provides incremental development to deliver frequent capability updates to the Fleet, developing, testing, certifying, and fielding system upgrades and cyber-security patches. The project maintains interoperability with current and future interfaces; supports mission data exchange; improves track/sensor processing and analysis techniques; improves mission planning; improves data recording, reconstruction, and distribution; improves embedded simulation and training capabilities and implements cyber-security measures to effectively employ overall CVN self-defense capabilities. CV-TSC integrates sensor data from off-board aircraft, organic platform sensors, Minotaur multi-sensor fused track data, Link-16 track data, Ship Self Defense System (SSDS) track data (Product Line Architecture (PLA) and non-PLA), Global Command and Control System (GCCS) Over-the-Horizon track data, and environmental and threat databases to assess the threat and assist the Tactical Action Officer (TAO) and Composite Warfare Commander (CWC) to effectively employ overall CVN self-defense capabilities. CV-TSC generates real-time ASW/SUW information and recommendations, tactical planning and employment of ASW/SUW assets, ASW/SUW sensor data processing and analysis, and distribution of tactically significant data. Aircraft supported include MH-60R/S Seahawk, and P-8 Poseidon and MQ-4C Triton as future ASW/SUW systems.

System development is accomplished through the following initiatives:

- 1) Maintaining interoperability with the local CVN warfare systems through current and future interfaces;
- 2) Continuing to support mission data exchange and tactical control with current and future ASW/SUW assets and their mission systems;
- 3) Improving track and sensor processing and analysis techniques as new track and sensor data becomes available;
- 4) Improving mission planning support for the ASW/SUW missions conducted from the CVN;
- 5) Improving data recording, reconstruct, and distribution to meet the decreasing timelines associated with getting tactically significant data to other end users both on and off platform;
- 6) Improving embedded simulation and training capabilities to enable operator proficiencies; and
- 7) Implementing cyber security measures.

Fleet Capability Release 5 (FCR-5) delivers the initial Minotaur Multi-Sensor Fusion integration/interface with CV-TSC and will be fielded on Aircraft Carriers and shore sites. Minotaur Multi-Sensor Fusion is required to provide increased battlespace awareness, and will significantly accelerate the find, fix, and track capabilities within the Maritime Intelligence Surveillance and Reconnaissance & Targeting (MIS&RT) function when CV-TSC is operating in a communications-denied environment.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: CV-TSC Development / Integration / Test / Certification	5.936	8.519	4.954	0.000	4.954

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603512N / Carrier Systems Development		Project (Number/Name) 3216 / Tactical Support Center-Integration		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Articles:		-	-	-	-	-
Description: CV-TSC's evolutionary acquisition approach to developing, testing, certifying, and fielding system upgrades and cyber-security patches is implemented through a series of phased Fleet Capability Releases (FCRs).						
FY 2023 Plans:						
- Complete Independent Verification and Validation (IV&V) for FCR-5.						
- Complete certifications required for fielding FCR-5 (Technical Insertion (TI)-16), to include Cybersecurity Risk Management Framework (RMF) Step 6 for Information Assurance (IA) Accreditation, Platform Information Technology (PIT) / Authorization to Operate (ATO), Integrated Shipboard Network System (ISNS) and Consolidated Afloat Network Enterprise Systems (CANES) Certifications, Program Executive Office (PEO) Integrated Warfare Systems (IWS) Element Certification, and Combat System Test (CST).						
- Begin FCR-6 development to include Common Processing System (CPS) TI-16 Tech Refresh integration (for in-service CVNs), Interface Processor System (IPS) TI-12 requalification, Integrated Bridge System (IBS) improvements, Infrastructure as a Service (IaaS), GUNSS sensor integration improvements, and integrate the MH-60R changes to include a Minotaur interface over the Common Data Link (CDL) Line of Sight (LoS) link.						
FY 2024 Base Plans:						
- Complete FCR-6 development to include CPS TI-16 Tech Refresh integration (for in-service CVNs), IPS TI-12 requalification, IBS improvements, IaaS, GUNSS sensor integration improvements, and integrate the MH-60R changes to include a Minotaur interface over the CDL LoS link.						
- Begin IV&V for FCR-6.						
- Initiate planning to acquire certifications required for fielding FCR-6, to include: PIT/ATO, ISNS and CANES Certifications, PEO IWS Element Certification, and CST.						
- Initiate requirements generation and planning of enhancements for FCR-7.						
- Initiate development and integration of enhancements for FCR-7.						
FY 2024 OCO Plans:						
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement:						
- FY 2023 (\$8.519M) to FY 2024 (\$4.954M) decrease (\$-3.565M) reflects a reprioritization of funding in FY 2024 for the Minotaur Family of Systems (MFoS) and is consistent with planned program phasing.						
Accomplishments/Planned Programs Subtotals		5.936	8.519	4.954	0.000	4.954

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603512N / Carrier Systems Developm ent	Project (Number/Name) 3216 / Tactical Support Center-Integration	

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• OPN/2176: Undersea Warfare Support Equipment (N98/CV-TSC only)	2.643	2.336	4.263	-	4.263	1.448	0.402	0.410	0.418	Continuing	Continuing

Remarks

D. Acquisition Strategy

- CV-TSC utilizes an incremental development approach that aims to deliver capability updates via Fleet Capability Releases (FCRs). This approach allows required capability to be delivered to address emerging Fleet needs and provides frequent opportunities to ensure interoperability is synchronized with the Ship Self Defense System (SSDS) and other critical ship-board systems. The acquisition strategy places heavy emphasis on the use of standardized combat system hardware and software hosting, minimizing the use of custom hardware thereby reducing life-cycle costs.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603512N / Carrier Systems Development				Project (Number/Name) 3216 / Tactical Support Center-Integration					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CV-TSC Development / Integration	C/CPFF	Adaptive Methods : VA	5.322	0.486	Feb 2022	0.310	Dec 2022	0.300	Dec 2023	-		0.300	Continuing	Continuing	Continuing
CV-TSC Development / Integration	C/CPFF	JHU/APL : MD	0.250	0.660	Feb 2022	0.770	Dec 2022	0.650	Dec 2023	-		0.650	Continuing	Continuing	Continuing
CV-TSC Development / Integration	WR	NAWC/Pax River : MD	1.595	0.175	Nov 2021	0.140	Nov 2022	0.215	Nov 2023	-		0.215	Continuing	Continuing	Continuing
CV-TSC Development / Integration	WR	NRL : DC	0.325	0.000		0.000		0.000		-		0.000	0.000	0.325	-
CV-TSC Development / Integration	WR	NSWC/Carderock : MD	2.650	0.000		0.000		0.000		-		0.000	0.000	2.650	-
CV-TSC Development / Integration Text	WR	NSWC/Crane : IN	0.000	0.140	Mar 2022	0.165	Nov 2022	0.165	Nov 2023	-		0.165	Continuing	Continuing	Continuing
CV-TSC Development / Integration	WR	NSWC/Dahlgren : VA	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	-
CV-TSC Development / Integration	WR	NUWC/Keyport : WA	35.363	3.223	Nov 2021	5.139	Nov 2022	2.222	Nov 2023	-		2.222	Continuing	Continuing	Continuing
CV-TSC Development / Integration	WR	SPAWAR : CA	4.160	0.000		0.000		0.000		-		0.000	0.000	4.160	-
CV-TSC Development / Integration	C/CPFF	VAR* : VAR*	2.883	0.342	Dec 2021	0.970	Dec 2022	0.542	Dec 2023	-		0.542	Continuing	Continuing	Continuing
Boundary Defense Capability Design/ Development	WR	NSWC/Philadelphia : PA	4.046	0.000		0.000		0.000		-		0.000	0.000	4.046	-
Boundary Defense Capability Design/ Development	C/CPFF	VAR* : VAR*	4.495	0.000		0.000		0.000		-		0.000	0.000	4.495	-
Subtotal			61.189	5.026		7.494		4.094		-		4.094	Continuing	Continuing	N/A
Remarks															
* Consists of multiple performing activities with funding for each not greater than \$1M per year.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603512N / Carrier Systems Development				Project (Number/Name) 3216 / Tactical Support Center-Integration					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NUWC//Keyport : WA	3.298	0.600	Nov 2021	0.610	Nov 2022	0.600	Nov 2023	-		0.600	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NUWC/Newport : RI	0.125	0.100	Mar 2022	0.100	Nov 2022	0.100	Nov 2023	-		0.100	Continuing	Continuing	Continuing
Subtotal			3.423	0.700		0.710		0.700		-		0.700	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support - Acquisition, Business & Finance	C/CPAF	BAE Systems : MD	0.411	0.000		0.000		0.000		-		0.000	0.000	0.411	-
Program Management Support - Acquisition, Business & Finance	C/CPFF	CACI : VA	0.134	0.000		0.000		0.000		-		0.000	0.000	0.134	-
Program Management Support - Acquisition, Business & Finance	C/CPFF	Booz Allen Hamilton : VA	0.041	0.040	Mar 2022	0.130	Dec 2022	0.065	Dec 2023	-		0.065	Continuing	Continuing	Continuing
Program Management Support - Systems Engineering and Technical Assistance (SETA)	C/CPFF	CGI Federal : VA	0.558	0.000		0.000		0.000		-		0.000	0.000	0.558	-
Program Management Support - Systems Engineering and Technical Assistance (SETA)	C/CPFF	KMS Solutions : VA	0.150	0.150	Mar 2022	0.165	Dec 2022	0.075	Dec 2023	-		0.075	Continuing	Continuing	Continuing
Program Office Travel	Allot	NAVSEA PEO IWS5 : DC	0.084	0.020	Oct 2021	0.020	Oct 2022	0.020	Oct 2023	-		0.020	Continuing	Continuing	Continuing
Subtotal			1.378	0.210		0.315		0.160		-		0.160	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023				
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603512N / Carrier Systems Development					Project (Number/Name) 3216 / Tactical Support Center-Integration					
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			65.990	5.936		8.519		4.954		-		4.954	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

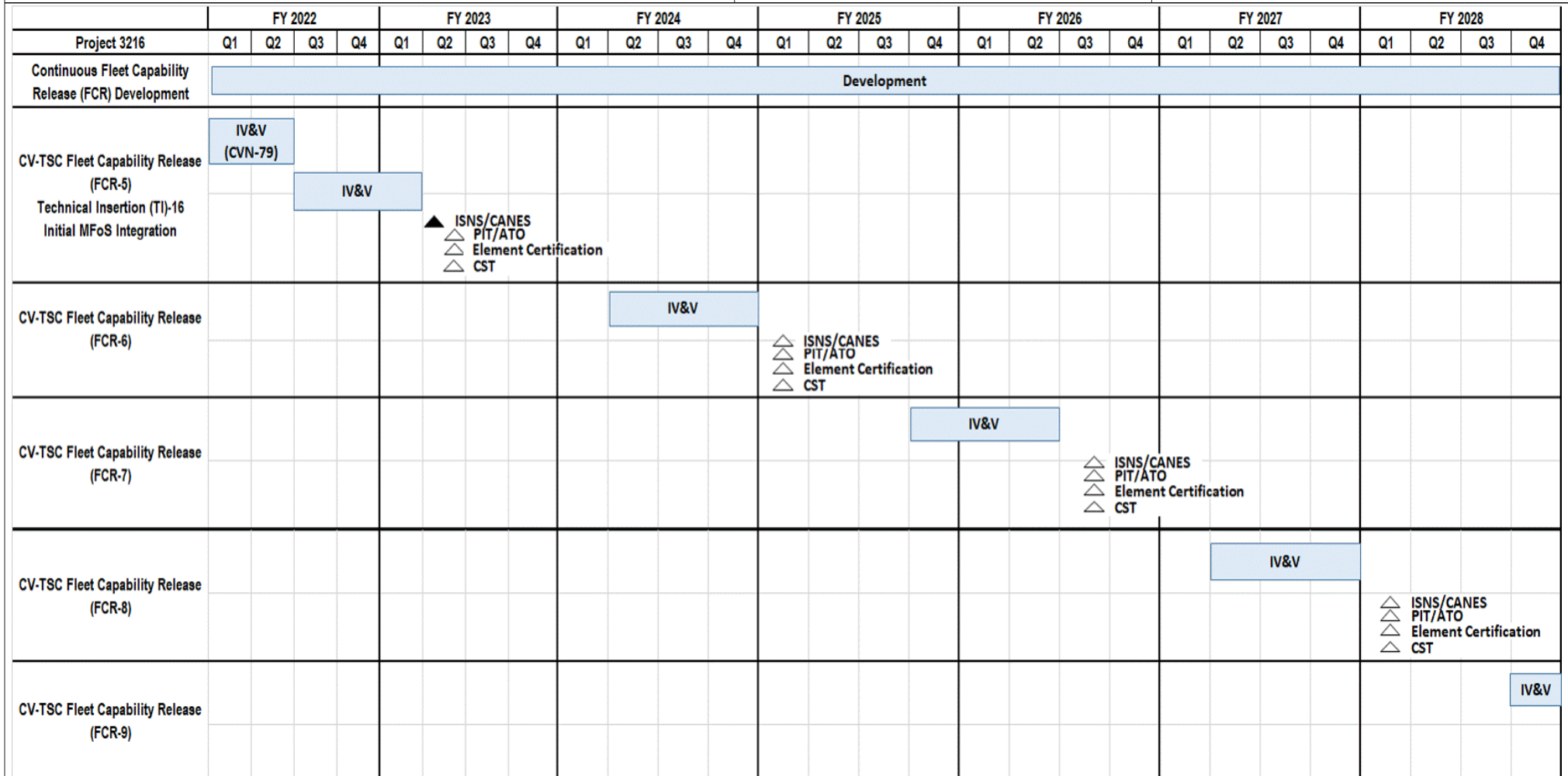
1319 / 4

R-1 Program Element (Number/Name)

PE 0603512N / Carrier Systems Development

Project (Number/Name)

3216 / Tactical Support Center-Integration



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603512N / Carrier Systems Development

Project (Number/Name)

3216 / Tactical Support Center-Integration

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
CV-TSC Fleet Capability Release (FCR) Development Pipeline				
CV-TSC Fleet Capability Release (FCR) Development Pipeline	1	2022	4	2028
CV-TSC FCR-5 (Initial Minotaur Integration)				
CV-TSC FCR-5 IV&V (CVN-79/TI-16)	1	2022	2	2022
CV-TSC FCR-5 IV&V	3	2022	1	2023
CV-TSC FCR-5 ISNS / CANES Certification	2	2023	2	2023
CV-TSC FCR-5 PIT/ATO	2	2023	2	2023
CV-TSC FCR-5 Element Certification	2	2023	2	2023
CV-TSC FCR-5 CST	2	2023	2	2023
CV-TSC FCR-6				
CV-TSC FCR-6 IV&V	2	2024	4	2024
CV-TSC FCR-6 ISNS / CANES Certification	1	2025	1	2025
CV-TSC FCR-6 PIT/ATO	1	2025	1	2025
CV-TSC FCR-6 Element Certification	1	2025	1	2025
CV-TSC FCR-6 CST	1	2025	1	2025
CV-TSC FCR-7				
CV-TSC FCR-7 IV&V	4	2025	2	2026
CV-TSC FCR-7 ISNS / CANES Certification	3	2026	3	2026
CV-TSC FCR-7 PIT/ATO	3	2026	3	2026
CV-TSC FCR-7 Element Certification	3	2026	3	2026
CV-TSC FCR-7 CST	3	2026	3	2026
CV-TSC FCR-8				

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603512N / Carrier Systems Development

Project (Number/Name)

3216 / *Tactical Support Center-Integration*

	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
CV-TSC FCR-8 IV&V	2	2027	4	2027
CV-TSC FCR-8 ISNS / CANES Certification	1	2028	1	2028
CV-TSC FCR-8 PIT/ATO	1	2028	1	2028
CV-TSC FCR-8 Element Certification	1	2028	1	2028
CV-TSC FCR-8 CST	1	2028	1	2028
CV-TSC FCR-9				
CV-TSC FCR-9 IV&V	4	2028	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603512N / Carrier Systems Development				Project (Number/Name) 4005 / In-Service Carrier Systems Development			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
4005: In-Service Carrier Systems Development	30.054	1.173	3.048	1.141	-	1.141	1.115	4.476	5.416	4.368	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The In-Service Carrier Systems Demonstration and Validation Program develops new technology and enhancements for 11 nuclear powered Aircraft Carriers with nearly 300 systems onboard each vessel. These systems are a combination of historical and new initiatives that deliver an affordable, robust, operator-friendly automated control environment. In order to deter threats and properly integrate all of the systems, the Demonstration and Validation Program segments the testing and upgrades into four areas: system architecture, requirements/specification development, technology selection, cyber-security engineering and integration, and software development. The Demonstration and Validation Program also focuses on the Total Ownership Costs of each system and any equipment obsolescence issues. Initial technologies include the Uninterruptible Power Supply (UPS) Replacements, the Integrated Condition Assessment System (ICAS), the On-Machine I/O development for Low Pressure Air Plants (LPAP) and LPAP Air End Re-design. Demonstration technologies include Advanced Damage Control System (ADCS) software improvements, Input / Output Controller (IOC) Replacement, Fleet wireless Personal Digital Assistant (PDA), Weapons Elevator Laser Positioning System (WELPS), Legacy Steering Interface (LSI) upgrades, Passive Countermeasures System (PCMS) alternate measurement capability, additive manufacturing efforts, and Weapons Elevators Programmable Logic Controller (PLC) redesign.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: In-Service Carrier Systems Development Articles:								1.173	3.048	1.141	0.000	1.141
								-	-	-	-	-
FY 2023 Plans: Fiscal Year 2023 plans include continued support to Aircraft Carrier technologies, with emphasis on Additive Manufacturing and the Weapon Elevator Programmable Logic Controller (PLC) Re-design. Modifications, upgrades, and development of systems and software will be ongoing in support of In-Service Aircraft Carrier Modernization and Total Ownership Cost reduction initiatives to address equipment obsolescence. Fiscal Year 2023 also encompasses CYBER Security requirements to include the implementation of the Defense-in-Depth Functional Implementation Architecture (DFIA), the CYBERSAFE program, and risk assessment, development, and testing of the Identify Protect Detect Respond and Recover strategy.												
FY 2024 Base Plans: Fiscal Year 2024 plans include continued support to Aircraft Carrier technologies, with emphasis on Additive Manufacturing and the Weapon Elevator Programmable Logic Controller (PLC) Re-design. Modifications, upgrades, and												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603512N / <i>Carrier Systems Development</i>		Project (Number/Name) 4005 / <i>In-Service Carrier Systems Development</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
development of systems and software will be ongoing in support of In-Service Aircraft Carrier Modernization and Total Ownership Cost reduction initiatives to address equipment obsolescence.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: The FY 2023 (\$3.048M) to FY 2024 (\$1.141M) program decrease (\$-1.907M) reflects a decision to re-align the funding reprioritization of CVN efforts to fund Carrier Wholeness.						
Accomplishments/Planned Programs Subtotals		1.173	3.048	1.141	0.000	1.141
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy Investigate, demonstrate, and implement available technologies to deliver a robust, operator-friendly automation control environment for Navy Aircraft Carrier shipboard equipment to reduce workload, manpower requirements, and Total Ownership Costs (TOC). Deliver affordable operational upgrades onboard each platform through comparative initiatives and analysis without sacrificing schedule, performance, or requirements.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603512N / Carrier Systems Development				Project (Number/Name) 4005 / In-Service Carrier Systems Development					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Ship Integration	WR	NSWC : Philadelphia	4.791	0.456	Nov 2021	0.608	Nov 2022	0.300	Nov 2023	-		0.300	0.000	6.155	-
Ship Integration	WR	NSWC : Dahlgren	0.197	0.000		0.000		0.000		-		0.000	0.000	0.197	-
Ship Integration	WR	NSWC : Carderock	0.475	0.000		0.000		0.000		-		0.000	0.000	0.475	-
Ship Integration	WR	DOE : KCNSC	0.000	0.000		0.600	Nov 2022	0.000		-		0.000	0.000	0.600	-
Subtotal			5.463	0.456		1.208		0.300		-		0.300	0.000	7.427	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	WR	NSWC : Philadelphia	8.586	0.100	Nov 2021	0.725	Nov 2022	0.375	Nov 2023	-		0.375	0.000	9.786	-
Program Management Support	WR	NSWC : Philadelphia	3.677	0.100	Nov 2021	0.200	Nov 2022	0.000		-		0.000	0.000	3.977	-
Training Development	WR	NSWC : Philadelphia	1.615	0.100	Nov 2021	0.200	Nov 2022	0.000		-		0.000	0.000	1.915	-
Integrated Logistics Support	WR	NSWC : Philadelphia	1.989	0.100	Nov 2021	0.200	Nov 2022	0.000		-		0.000	0.000	2.289	-
Software Development	WR	NSWC : Dahlgren	0.308	0.000		0.000		0.000		-		0.000	0.000	0.308	-
Program Management Support	WR	NSWC : Dahlgren	0.317	0.000		0.000		0.000		-		0.000	0.000	0.317	-
Program Management Support	WR	NSWC : Carderock	0.257	0.026	Nov 2021	0.265	Nov 2022	0.310	Nov 2023	-		0.310	0.000	0.858	-
Subtotal			16.749	0.426		1.590		0.685		-		0.685	0.000	19.450	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Test & Evaluation (OT&E)	WR	NIWC : Atlantic	0.214	0.000		0.000		0.000		-		0.000	0.000	0.214	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603512N / Carrier Systems Developm ent				Project (Number/Name) 4005 / In-Service Carrier Systems Development					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Test & Evaluation (OT&E)	WR	NSWC : Carderock	0.225	0.000		0.000		0.000		-		0.000	0.000	0.225	-
Operational Test & Evaluation (OT&E)	WR	NSWC : Philadelphia	7.134	0.291	Nov 2021	0.250	Nov 2022	0.156	Nov 2023	-		0.156	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	WR	NSWC : Dahlgren	0.261	0.000		0.000		0.000		-		0.000	0.000	0.261	-
Subtotal			7.834	0.291		0.250		0.156		-		0.156	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
DAWF	Various	Various : Various	0.008	0.000		0.000		0.000		-		0.000	0.000	0.008	-
Subtotal			0.008	0.000		0.000		0.000		-		0.000	0.000	0.008	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			30.054	1.173		3.048		1.141		-		1.141	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																Date: March 2023					
Appropriation/Budget Activity 1319 / 4										R-1 Program Element (Number/Name) PE 0603512N / Carrier Systems Development								Project (Number/Name) 4005 / In-Service Carrier Systems Development			

In-Service Carrier Systems Development

Project4005	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
CVN78 CL Platform support for Joint Strike fighter																												
Additive Manufacturing																												
Weapons Elevator PLC Re-design																												
Cyber Security Wholeness																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603512N / Carrier Systems Developm ent	Project (Number/Name) 4005 / In-Service Carrier Systems Development

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 4005				
CVN78 CL Platform support for Joint Strike Fighter: CVN78 CL Platform support for Joint Strike fighter	1	2022	3	2022
Additive Manufacturing: Additive Manufacturing	1	2022	4	2028
Weapons Elevator PLC Redesign: Weapons Elevator PLC Redesign	1	2022	4	2024
CYBER Security Wholeness: Cyber Security Wholeness Part I	1	2023	4	2023
CYBER Security Wholeness: Cyber Security Wholeness Part II	1	2026	4	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603525N / <i>PILOT FISH</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	391.704	671.000	916.208	-	916.208	950.600	960.902	900.371	933.210	Continuing	Continuing
0428: <i>Pilot Fish</i>	0.000	391.704	671.000	916.208	-	916.208	950.600	960.902	900.371	933.210	Continuing	Continuing

A. Mission Description and Budget Item Justification

The details of this budget justification are classified, per Executive Order 13526, Sec 1.4 (a) and are submitted annually to Congress in the classified budget justification book.

B. Program Change Summary (\$ in Millions)	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>
Previous President's Budget	405.917	672.461	855.888	-	855.888
Current President's Budget	391.704	671.000	916.208	-	916.208
Total Adjustments	-14.213	-1.461	60.320	-	60.320
• Congressional General Reductions	-	-1.461			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-14.213	0.000			
• Program Adjustments	0.000	0.000	-5.700	-	-5.700
• Rate/Misc Adjustments	0.000	0.000	66.020	-	66.020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603527N / RETRACT LARCH							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	60.941	7.483	7.545	-	7.545	7.380	7.303	7.217	7.363	Continuing	Continuing
2690: Retract Larch	0.000	60.941	7.483	7.545	-	7.545	7.380	7.303	7.217	7.363	Continuing	Continuing

A. Mission Description and Budget Item Justification

The details of this budget justification are classified, per Executive Order 13526, Sec 1.4 (a) and are submitted annually to Congress in the classified budget justification book.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	44.076	7.483	7.459	-	7.459
Current President's Budget	60.941	7.483	7.545	-	7.545
Total Adjustments	16.865	0.000	0.086	-	0.086
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.135	0.000			
• Program Adjustments	18.000	0.000	0.000	-	0.000
• Rate/Misc Adjustments	0.000	0.000	0.086	-	0.086

Change Summary Explanation

Technical: Not applicable.
Schedule: Not applicable.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	PE 0603536N / <i>RETRACT JUNIPER</i>											
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	140.080	239.088	271.109	-	271.109	213.383	190.182	172.574	276.056	Continuing	Continuing
4016: <i>Retract Sycamore</i>	0.000	140.080	239.088	271.109	-	271.109	213.383	190.182	172.574	276.056	Continuing	Continuing

A. Mission Description and Budget Item Justification

The details of this budget justification are classified, per Executive Order 13526, Sec 1.4 (a) and are submitted annually to Congress in the classified budget justification book.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	144.349	239.336	248.073	-	248.073
Current President's Budget	140.080	239.088	271.109	-	271.109
Total Adjustments	-4.269	-0.248	23.036	-	23.036
• Congressional General Reductions	-	-0.248			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-4.269	0.000			
• Program Adjustments	0.000	0.000	-1.972	-	-1.972
• Rate/Misc Adjustments	0.000	0.000	25.008	-	25.008

Change Summary Explanation

Technical: Not applicable.
Schedule: Not applicable.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>					R-1 Program Element (Number/Name) PE 0603542N / <i>Radiological Control</i>							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	7.254	0.758	0.772	0.811	-	0.811	0.818	0.834	0.851	0.869	Continuing	Continuing
1830: <i>RADIAC Development</i>	7.254	0.758	0.772	0.811	-	0.811	0.818	0.834	0.851	0.869	Continuing	Continuing

A. Mission Description and Budget Item Justification

Mission Description: The Radiation Detection, Indication and Computation (RADIAC) Program is responsible for providing radiation monitoring instruments that detect and measure ionizing radiation. These instruments are used on all Navy, Coast Guard and Military Sealift Command vessels, and at every Navy shore installation, in order to ensure the safety of personnel, continuity of operations in radiological contingencies, and protection of the environment.

Justification: Title 10 of the Code of Federal Regulations, Part 20 (10 CFR 20) requires RADIAC instruments be used to ensure the safety of personnel who work with or who are exposed to radioactive materials in their jobs. Additionally, the Navy's mission requires personnel and ships to have the ability to operate in radiological environments and the ability to identify and interdict radiological Weapons of Mass Destruction (WMD). Navy programs that require RADIAC instruments for Occupational Safety & Health (OSH) under the provisions of 10 CFR 20 include Naval Nuclear Propulsion, Nuclear Weapons, Medical, and Radiological Affairs Support. Non-OSH programs include Radiological Defense, Consequence Management, Training, Technical (RADIAC calibration, shielding evaluation, research) and Radiological Search (maritime interdiction and radiological search missions to locate or intercept WMD).

This budget item develops, tests and evaluates new, highly reliable, more easily calibrated, easy to care and maintain, light weight and modern RADIAC instruments in order to improve the effectiveness of radiation safety, to make instruments simpler to use, and to reduce life cycle costs. The ultimate goal is to replace old, bulky, costly to maintain and repair, unreliable and obsolete instrumentation with multifunction equipment that can be automatically calibrated at greatly reduced cost.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	0.761	0.772	0.794	-	0.794
Current President's Budget	0.758	0.772	0.811	-	0.811
Total Adjustments	-0.003	0.000	0.017	-	0.017
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.003	0.000			
• Rate/Misc Adjustments	0.000	0.000	0.017	-	0.017

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603542N / Radiological Control				Project (Number/Name) 1830 / RADIAC Development			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
1830: RADIAC Development	7.254	0.758	0.772	0.811	-	0.811	0.818	0.834	0.851	0.869	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Mission: The Radiation Detection, Indication and Computation (RADIAC) Program is responsible for providing radiation monitoring instruments that detect and measure radiation in accordance with the provisions of Title 10 of the Code of Federal Regulations (10 CFR 20). These instruments are used on all vessels afloat and at every shore installation in order to ensure the safety of personnel and the environment. RADIACs are also required after an act of terrorism or war that involves nuclear material in order to enable continuation of warfighting ability.

Justification: Many RADIAC instruments and dosimetry systems are decades old and approaching the end of their useful lives. In some cases the equipment and replacement parts are no longer manufactured, making the equipment logistically unsupportable. In other cases increasing failure rates due to age make replacements an economic efficiency improvement. In all cases a technology refresh will make both economic sense in terms of lowering the total ownership costs, and will also provide increased operational capabilities.

Naval Nuclear Propulsion Program (NNPP): Instruments are developed to support the safe operation and maintenance of nuclear powered vessels and at nuclear maintenance facilities.

Non-NNPP: Instruments are developed to support other than NNPP end users, such as Explosive Ordnance Disposal, Nuclear Weapons, Medical, Industrial Radiography, Radiological Defense and Training.

Visit, Board, Search & Seizure (VBSS): The Navy has been tasked to intercept and board vessels at sea to search for nuclear or radiological materials that could be used for terrorist attacks. These instruments would have different characteristics than those used for NNPP and non-NNPP purposes and prototypes must be developed and/or tested and evaluated.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Primary Dosimetry	0.157	0.245	0.215	0.000	0.215
Articles:	-	-	-	-	-
Description: The need for primary dosimetry is inherent due to the Navy's operation of nuclear reactors and their emission of ionizing radiation. Title 10 CFR 20.1502 states "Each licensee shall monitor exposures to radiation and radioactive material at levels sufficient to demonstrate compliance with the occupational dose limits." A primary dosimeter must pass accreditation proficiency testing, allowing the reading obtained					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603542N / Radiological Control		Project (Number/Name) 1830 / RADIAC Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
to become a part of an individual's permanent health record. This permanent record is used to protect the individual radiation worker's health, and also the Navy from future liability. The Navy's current primary device is the DT-702/PD, a passive Thermo Luminescence Dosimeter (TLD). Existing TLDs and newer technologies, such as Optically Stimulated Luminescence (OSL), must be continually researched to determine on-going performance parameters, cost to field and cost to maintain, since the current system is approaching the end of its useful life and must be replaced by 2030.						
A passive device does not provide a display of the dose being received, which can be important in certain circumstances. The dosimeter instead must be sent to a facility with a special reader to recover the dose, which is then entered in the individual's medical records. An active device displays the dose digitally in real time, providing immediate feedback in high risk scenarios. Newer passive-active systems can do both.						
FY 2023 Plans: Cooperative Research and Development Agreement (CRADA) testing of the ThermoFisher Scientific, Inc. (TFS) and Landauer, Inc. dosimetry systems will be completed and a final report for each of the CRADAs will be submitted to NAVSEA 09RD and to the contractors. NSWCCD continued the CRADA testing of the Mirion Technologies, Inc. dosimetry system.						
CRADAs for TFS and Landauer, Inc. were extended for an additional three years to test the Radiological Affairs Support Program (RASP), Bureau of Medicine (BUMED) and the Naval Nuclear Propulsion Program (NNPP) applications of the software and hardware. This includes but is not limited to the following: dosimeter connectivity, dosimetry reports and the dosimeter's ruggedness for use by NNPP, BUMED, and RASP.						
FY 2024 Base Plans: Mirion Technologies, Inc. CRADA testing will be finalized and a final report will be submitted to NAVSEA 09RD and the contractor. NSWCCD will extend the CRADA for Mirion Technologies, Inc. for an additional three years to test the RASP, BUMED and NNPP applications of the software and hardware. This includes but is not limited to the following: dosimeter connectivity, dosimetry reports, and the dosimeter's ruggedness for use by NNPP, BUMED, and RASP. NSWCCD will continue the CRADA testing the of TFS and Landauer, Inc. dosimetry systems.						
FY 2024 OCO Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603542N / Radiological Control		Project (Number/Name) 1830 / RADIAC Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: Decrease is due to slightly less testing being conducted in FY24.						
Title: Secondary Dosimetry		0.157	0.212	0.085	0.000	0.085
Articles:		3	-	-	-	-
Description: Secondary dosimetry includes the monitoring of doses to the hands, feet and eyes. In some medical and industrial applications, there is a high risk of such local high exposures due to the handling of sources, working close to a high radiation field, or using/cleaning high-energy beta emitters. Because of this, the need to accurately measure extremity dose is of significant importance to the Navy. The legacy system currently used for hands and feet dose measurements is RadStar. This is an active system (see the Primary Dosimetry Overall Description task for a discussion of passive and active dosimeters), but it is no longer supported by the vendor and must be replaced.						
To that end the ED3 system was procured in FY18 and has been tested and a report rendered on its suitability as a replacement. This is another active system, but shortfalls noted were that it currently measures only exposure to the hands, and it is too fragile for industrial-type use. Another active system being considered is the iMUX, which has the advantage of being wireless (the other two require wires that extend from the extremities to a pager-sized device clipped to the belt or worn on the wrist), and is capable of measuring dose at both the hands and feet.						
Measurement of dose at the eyes is currently extrapolated from the Navy's passive primary dosimeter, the DT-702/PD. Because eyes are subject to development of cataracts with prolonged or high dose exposure to radiation, a more precise and real time measuring device is being sought in the systems being evaluated.						
FY 2023 Plans: NSWCCD will complete testing and begin drafting the final report.						
FY 2024 Base Plans: NSWCCD will submit a final report to NAVSEA 09RD.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603542N / Radiological Control		Project (Number/Name) 1830 / RADIAC Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Decrease from FY23 to FY24 is because RDTE project will be completed and transitioned into OPN.						
<div><div>Title: Visit, Board, Search & Seizure</div><div>Articles:</div><div>Description: The Visit, Board, Search & Seizure (VBSS) mission of the Navy is the requirement to board ships and be able to detect and identify potential radiological or nuclear Weapons of Mass Destruction (WMD). Such a sensitive mission requires leading edge technology and capabilities to ensure success. The AN/PDX-1 RADIAC Set was fielded in response to a Joint Urgent Operational Needs Statement to meet this requirement. It contains three instruments that serve different purposes: (1) a Handheld Radiation Monitor (HRM)that searches for radiological materials; (2) a Radioisotope Identifier (RID) that identifies the type of radiological material located; and (3) a Personal Radiation Detector (PRD) that displays the radiological dose the VBSS team members may be receiving so that they can be aware if they are being exposed to dangerous levels of radioactivity during the mission. Current technology dictates that the sensitivity of the detectors is directly proportional to the size of the detector element; i.e., the larger the detector, the more sensitive and capable it is. However, in VBSS there must be a tradeoff between size/weight and capability, since it is difficult and hazardous for boarding parties to carry a backpack-sized detector, along with their weapons and other gear, up a rope ladder to board a vessel on the high seas. This will be a continuing effort to find smaller, lighter instruments with enhanced sensitivity, reach-back capability, and other enhancements to provide the Navy the best and most cost effective equipment possible for this mission.</div><div>FY 2023 Plans:</div><div>N/A</div><div>FY 2024 Base Plans:</div><div>N/A</div><div>FY 2024 OCO Plans:</div><div>N/A</div></div>		0.080 -	0.000 -	0.000 -	0.000 -	0.000 -
<div><div>Title: Laboratory Test Equipment</div><div>Articles:</div><div>Description: Laboratory Test Equipment are used in laboratories to test and evaluate radiation detectors and dosimetry devices. The primary end users will be NSWCCD and NDC. The beta irradiators will be used throughout the development and procurement of the Navy's new primary dosimetry system to evaluate system performance. Handheld radiation detection equipment from the Radiological Detection System (RDS) can also</div></div>		0.069 1	0.080 -	0.020 -	0.000 -	0.020 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603542N / Radiological Control		Project (Number/Name) 1830 / RADIAC Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
be evaluated using the beta irradiators. The upgraded Ortec equipment will be used to analyze the new accident dosimeter after exposure to a criticality event. FY 2023 Plans: The GC-60 source procured in FY22 will be installed. The Site Acceptance Tests (SAT) to ensure optimal performance of the irradiators located in the radiation range is maintained will be performed. FY 2024 Base Plans: A neutron shielding study will be performed to determine if the NSWCCD range room will be able to hold a neutron irradiator. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Decrease from FY23 to FY24 is due to changes to tasks for FY24.						
Title: AN/PDR-70 Electronics Upgrade Articles: Description: The AN/PDR-70 provides accurate dose rate measurements during neutron radiation surveys. The AN/PDR-70 is over 25 years old and as identified by the 2020 life cycle audit (LCA), has multiple obsolescence issues. Based on the LCA, a replacement for the AN/PDR-70 needs to be identified within the next six years. A possible solution is replacing the electronics package on the detector. This has been done with other legacy RADIACs and is an effective method of extending the life of the device for an additional 15-20 years. In addition to the electronics upgrade, NSWCCD will also research and test the effects of modifying the amount of moderator material used on the instrument. This will have a positive impact on the weight of the device, which has been a long-standing complaint by the end user community. FY 2023 Plans: N/A FY 2024 Base Plans: N/A FY 2024 OCO Plans: N/A		0.054 -	0.000 3	0.000 -	0.000 -	0.000 -
Title: Radiological Detection System Training Device		0.148	0.055	0.212	0.000	0.212

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603542N / Radiological Control		Project (Number/Name) 1830 / RADIAC Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Articles: 3		3	-	-	-	-
<p>Description: The Radiological Detection System (RDS) is a survey meter with ancillary probes that is being procured by all the Services and some North Atlantic Treaty Organization (NATO) allies to replace the legacy equipment in all the respective procuring activities, and to allow joint interoperability. The Training Device will be an instrument designed to simulate the detection and measurement of alpha, beta, gamma, neutron and low energy X-rays for trainees on the RDS equipment without having to use actual radioactive sources. This makes the training safer and more cost effective to manage by avoiding the significant legal and safety issues involved when using radioactive sources.</p> <p>FY 2023 Plans: The prototypes procured in FY22 will be delivered and tested at NSWCCD. NSWCCD will reach out to Users to obtain operational feedback and recommendations for the prototypes.</p> <p>FY 2024 Base Plans: NSWCCD will complete prototype testing and provide a report with a recommendation to NAVSEA 04ND for procurement.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase from FY23 to FY24 is due to additional labor will be needed to conduct testing and complete analysis.</p>						
Title: Surface Contamination Monitor		0.093	0.126	0.115	0.000	0.115
Articles: -		-	-	-	-	-
<p>Description: A Surface Contamination Monitor (SCM) will allow the end user to quickly survey large areas for alpha-beta contamination. These types of surveys are required by federal, state and Navy regulations prior to releasing an area for unlimited use. SCM technology configurations include proportional detectors or scintillation type detectors. In addition, the SCM automated mapping and report generating features will accelerate these types of radiological surveys. These devices would be used at shipyard facilities by the Naval Nuclear Propulsion Program.</p> <p>FY 2023 Plans:</p>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603542N / Radiological Control		Project (Number/Name) 1830 / RADIAC Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
NSWCCD will continue participating on the CRADA status calls with PNSY. NSWCCD personnel will observe the operational portion of the SCM testing at PNSY. FY 2024 Base Plans: NSWCCD will continue participating in the CRADA status calls with PNSY and will observe the operational portion of the SCM testing. The SCM prototype testing is expected to be completed. NSWCCD will begin testing the Ludlum SCM. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Decrease is due to less testing being conducted in FY24.						
Title: Battery Powered Air Particle Sampler Articles: Description: The HD1151() are battery powered portable air samplers that have been fielded for over 15 years. The weight of the device at 38 pounds, has been a long-standing complaint by the end user community. These systems will be used by the NNPP for radioiodine sampling. FY 2023 Plans: NSWCCD will perform market research on available battery powered portable samplers. FY 2024 Base Plans: NSWCCD will procure systems and conduct testing. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Increase from FY23 to FY24 is initiation of project. FY24 includes procurement of systems and testing.		0.000 -	0.054 -	0.164 -	0.000 -	0.164 -
Accomplishments/Planned Programs Subtotals		0.758	0.772	0.811	0.000	0.811

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy							Date: March 2023		
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603542N / Radiological Control			Project (Number/Name) 1830 / RADIAC Development		

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To	Total Cost
			Base	OCO	Total					Complete	
• OPN 2920: RADIAC	7.828	7.647	16.475	-	16.475	32.162	32.418	31.807	33.591	Continuing	Continuing

Remarks

D. Acquisition Strategy

Development efforts are focused on evaluation, modification (as required to meet operational requirements) and adaptation of commercial-off-the-shelf (COTS) technology in order to minimize total ownership costs. To the maximum extent possible new contracts are targeted for fixed price efforts to control development cost.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603542N / Radiological Control				Project (Number/Name) 1830 / RADIAC Development					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	Various	NSWCCD : West Bethesda, MD	7.254	0.758	Nov 2021	0.772	Nov 2022	0.811	Nov 2023	-		0.811	Continuing	Continuing	Continuing
Subtotal			7.254	0.758		0.772		0.811		-		0.811	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			7.254	0.758		0.772		0.811		-		0.811	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603542N / Radiological Control

Project (Number/Name)

1830 / RADIAC Development

	FY22				FY23				FY24				FY25				FY26				FY27				FY28			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Primary Dosimetry																												
Test & Evaluation: TFS and Landauer Original CRADA Testing & Report																												
Test & Evaluation: Minion CRADA Test & Report																												
Test & Evaluation: TFS & Landauer Extension CRADA Testing & Report																												
Test & Evaluation: Minion Extension CRADA Testing & Report																												
Secondary Dosimetry																												
Test & Evaluation: Sample Electronic Dosimeters Testing & Report																												
Test & Evaluation: COTS Electronic Dosimeters Testing & Report																												
Contract Events: Procure Electronic Dosimeters for Extremity Applications																												
Visit, Board, Search & Seizure																												
Test & Evaluation: Test & Report on RID Batch 2																												
Test & Evaluation: Test & Report on PRD Batch 2																												
Test & Evaluation: Test & Report on HRM Batch 2																												
Laboratory Test Equipment																												
Contract Events: Procure GC60 and X80 Irradiator Computer Upgrades																												
Contract Events: Procure GC-60 Cobalt-60 Source																												
Contract Events: Procure Safety Interlock Upgrade																												
Radiological Detection System Training Device																												
Contract Events: Kits Contract Award																												
Test & Evaluation: Test & Report																												
Surface Contamination Monitor																												
Test & Evaluation: CRADA Test & Report																												
AN/PDR-70 Upgrade																												
Contract Events: Electronics Upgrade																												
Test & Evaluation: Test & Report																												
Battery Powered Air Particle Sampler																												
Contract Events: Procure Air Monitors																												
Test & Evaluation: Test & Report																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603542N / Radiological Control

Project (Number/Name)

1830 / RADIAC Development

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Primary Dosimetry				
Test & Evaluation: TFS and Landauer Original CRADA Testing & Report	1	2022	4	2022
Test & Evaluation: Mirion CRADA Test & Report	1	2022	4	2023
Test & Evaluation: TFS & Landauer Extension CRADA Testing & Report	1	2023	4	2025
Test & Evaluation: Mirion Extension CRADA Testing & Report	1	2024	4	2026
Secondary Dosimetry				
Test & Evaluation: iMUX Testing & Report	1	2021	4	2021
Test & Evaluation: Sample Electronic Dosimeters Testing & Report	1	2022	3	2022
Test & Evaluation: COTS Electronic Dosimeters Testing & Report	3	2022	3	2024
Contract Events: Procure Electronic Dosimeters for Extremity Applications	2	2022	2	2022
Visit, Board, Search & Seizure				
Test & Evaluation: Test & Report on RID Batch 2	1	2021	4	2021
Test & Evaluation: Test & Report on PRD Batch 2	1	2022	2	2022
Test & Evaluation: Test & Report on HRM Batch 2	1	2022	3	2022
Laboratory Test Equipment				
Contract Events: Procure GC60 and X80 Irradiator Computer Upgrades	4	2021	4	2021
Contract Events: Procure GC-60 Cobalt-60 Source	4	2022	4	2022
Contract Events: Procure Safety Interlock Upgrade	4	2023	4	2023
Radiological Detection System Training Device				
Contract Events: Kits Contract Award	4	2022	4	2022
Test & Evaluation: Test & Report	3	2023	4	2024
Surface Contamination Monitor				
Test & Evaluation: CRADA Test & Report	1	2022	4	2025

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603542N / Radiological Control		Project (Number/Name) 1830 / RADIAC Development	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
AN/PDR-70 Upgrade					
Contract Events: Electronics Upgrade		3	2025	3	2025
Test & Evaluation: Test & Report		1	2027	4	2027
Battery Powered Air Particle Sampler: Contract Events: Electronics Upgrade		2	2024	2	2024
Battery Powered Air Particle Sampler: Test & Evaluation: Test & Report		4	2024	4	2025

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603553N / Surface ASW							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	191.281	1.099	1.180	1.189	-	1.189	1.196	1.215	1.224	1.246	Continuing	Continuing
1704: <i>Undersea Warfare</i>	191.281	1.099	1.180	1.189	-	1.189	1.196	1.215	1.224	1.246	Continuing	Continuing

A. Mission Description and Budget Item Justification

The objective of this Program Element (PE) is to pursue the development of technologies with the goal of improving Anti-Submarine Warfare (ASW) effectiveness to the point of rendering the enemy submarine irrelevant against U.S. and coalition forces. U.S. adversaries continue to develop asymmetric capabilities and capacities to deter, disrupt, or delay the entry of U.S. and allied naval forces, and pose a constant challenge as we implement the Maritime Strategy. These trends increase the threats to U.S. surface combatants, thus requiring a focused effort to identify the most promising ASW technologies through a process of discovery, assessment, experimentation, and analysis. Studies, experiments, and/or technology developments under this PE will seek to improve the ability of surface combatants to detect, classify, localize, and track submerged contacts and detect and defend against modern torpedoes. To achieve these objectives, it is essential to develop new ASW technologies. The products from these efforts will be provided to the Advanced Capability Build (ACB) program supporting the continuing improvement of the AN/SQQ-89A(V)15 Surface Ship ASW Combat System.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	1.144	1.180	1.197	-	1.197
Current President's Budget	1.099	1.180	1.189	-	1.189
Total Adjustments	-0.045	0.000	-0.008	-	-0.008
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.045	0.000			
• Program Adjustments	0.000	0.000	-0.013	-	-0.013
• Rate/Misc Adjustments	0.000	0.000	0.005	-	0.005

Change Summary Explanation

FUNDING CHANGES SINCE PREVIOUS PRESIDENT'S BUDGET:

- FY 2022 decrease of \$-0.045M reflects the Small Business Innovative Research (SBIR) transfer.
- FY 2024 decrease of \$-0.008M reflects the application of miscellaneous program and rate adjustments.

FY 2023 TO FY 2024 BUDGET REQUEST INCREASE:

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PE 0603553N: *Surface ASW*
Navy

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603553N / <i>Surface ASW</i>				Project (Number/Name) 1704 / <i>Undersea Warfare</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
1704: <i>Undersea Warfare</i>	191.281	1.099	1.180	1.189	-	1.189	1.196	1.215	1.224	1.246	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The objective of this Project is to pursue the development of technologies with the goal of improving Anti-Submarine Warfare (ASW) effectiveness to the point of rendering the enemy submarine irrelevant against U.S. and coalition forces. U.S. adversaries continue to develop asymmetric capabilities and capacities to deter, disrupt, or delay the entry of U.S. and allied naval forces, and pose a constant challenge as we implement the Maritime Strategy. These trends increase the threats to U.S. surface combatants, thus requiring a focused effort to identify the most promising ASW technologies through a process of discovery, assessment, experimentation, and analysis. Studies, experiments, and/or technology developments under this PE will seek to improve the ability of surface combatants to detect, classify, localize, and track submerged contacts and detect and defend against modern torpedoes. To achieve these objectives, it is essential to develop new ASW technologies. The products from these efforts will be provided to the Advanced Capability Build (ACB) program supporting the continuing improvement of the AN/SQQ-89A(V)15 Surface Ship ASW Combat System.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: ASW Concept Development/Studies	1.099	1.180	1.189	0.000	1.189
Articles:	-	-	-	-	-
FY 2023 Plans: - Continue transition of Passive Coherent Processing (PiCP) technology into the AN/SQQ-89A(V)15 Surface Ship Anti-Submarine Warfare (ASW) Combat System production program for Torpedo Defense (TD). - Consolidate and integrate active TD and ASW code into a single common baseline. - Extend PiCP technology to perform cross-array association for TD. - Continue the development and testing of Doppler Matched Active Processing (DMAP)-for-ASW technology for towed arrays. - Investigate augmented Common Active Sonar (CAS) waveforms and processing and extend DMAP technology to CAS. - Initiate implementation of waveform optimization algorithms. - Initiate development and testing of Operator Machine Interface (OMI) enhancements to display DMAP and PiCP acoustic/automation data. - Awarded option under Broad Agency Announcement (BAA) development contract in support of AN/SQQ-89A(V)15 Surface Ship ASW Combat System Fleet requirements.					
FY 2024 Base Plans: - Continue development and testing of extending PiCP technology to perform cross-array association for TD.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603553N / <i>Surface ASW</i>		Project (Number/Name) 1704 / <i>Undersea Warfare</i>	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<ul style="list-style-type: none"> - Continue investigating augmented CAS waveforms and processing, and extend DMAP technology to CAS. - Complete testing and integration of OMI enhancements to display DMAP and PiCP acoustic and automation data in the AN/SQQ-89A(V)15 Surface Ship ASW Combat System. - Investigate using Joint Passive Active Localization (JPAL) for TD and ASW. - Award option under BAA development contract in support of AN/SQQ-89A(V)15 Surface Ship ASW Combat System Fleet requirements. <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> - FY 2023 (\$1.180M) to FY 2024 (\$1.189M) increase (\$+0.009M) is in line with the inflation expected with the RDT&EN appropriation.</p>					
Accomplishments/Planned Programs Subtotals	1.099	1.180	1.189	0.000	1.189

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• RDTEN/0205620N/1916: <i>Surface ASW System Improvement</i>	27.781	28.999	29.973	-	29.973	30.077	30.542	30.822	31.311	Continuing	Continuing
• OPN/2136: <i>AN/SQQ-89 Surf ASW Cmbt Sys</i>	126.871	140.157	138.065	-	138.065	139.468	140.799	143.627	146.896	Continuing	Continuing

Remarks

D. Acquisition Strategy

Use competitively awarded contracts from Broad Agency Announcement (BAA) solicitations and Other Transaction Authority (OTA). Successful technologies are transitioned to the AN/SQQ-89A(V)15 Surface Ship Anti-Submarine Warfare (ASW) Combat System Advanced Capability Build (ACB) development program funded under PE 0205620N, Project 1916 for integration and testing. Technologies are delivered every two years to the AN/SQQ-89A(V)15 Surface Ship ASW Combat System production program via the ACB spiral development process (ACB-21, ACB-23, ACB-25, etc.).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603553N / Surface ASW				Project (Number/Name) 1704 / Undersea Warfare					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ASW Concept Development/Studies	C/CPFF	AAC : NY	2.201	0.000		0.000		0.000		-		0.000	0.000	2.201	-
ASW Concept Development/Studies	C/CPFF	Adaptive Methods : VA	3.788	0.000		0.000		0.000		-		0.000	0.000	3.788	-
ASW Concept Development/Studies	C/CPFF	Alion Sciences : VA	8.749	0.000		0.000		0.000		-		0.000	0.000	8.749	-
ASW Concept Development/Studies	C/CPFF	Applied Physical Sciences : CT	2.433	0.675	Jan 2022	0.725	Jan 2023	0.725	Jan 2024	-		0.725	Continuing	Continuing	Continuing
ASW Concept Development/Studies	C/CPFF	In-Depth Engineering : VA	3.635	0.000		0.000		0.000		-		0.000	0.000	3.635	-
ASW Concept Development/Studies	C/CPFF	JHU/APL : MD	28.068	0.000		0.000		0.000		-		0.000	0.000	28.068	-
ASW Concept Development/Studies	C/CPFF	L-3 Communications : VA	3.000	0.000		0.000		0.000		-		0.000	0.000	3.000	-
ASW Concept Development/Studies	C/CPFF	Lockheed Martin - ISS : NY	7.110	0.000		0.000		0.000		-		0.000	0.000	7.110	-
ASW Concept Development/Studies	WR	NAVWAR : CA	0.277	0.000		0.000		0.000		-		0.000	0.000	0.277	-
ASW Concept Development/Studies	WR	NAWC/Pax River : MD	2.400	0.000		0.000		0.000		-		0.000	0.000	2.400	-
ASW Concept Development/Studies	WR	NFESC/PH : CA	5.350	0.000		0.000		0.000		-		0.000	0.000	5.350	-
ASW Concept Development/Studies	C/CPFF	Northrop Grumman : VA	4.684	0.000		0.000		0.000		-		0.000	0.000	4.684	-
ASW Concept Development/Studies	WR	NRL : DC	3.037	0.000		0.000		0.000		-		0.000	0.000	3.037	-
ASW Concept Development/Studies	WR	NSMA : VA	0.907	0.000		0.000		0.000		-		0.000	0.000	0.907	-
ASW Concept Development/Studies	WR	NSWC/Carderock : MD	4.373	0.000		0.000		0.000		-		0.000	0.000	4.373	-
ASW Concept Development/Studies	WR	NUWC/Keyport : WA	0.790	0.000		0.000		0.000		-		0.000	0.000	0.790	-








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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603553N / Surface ASW				Project (Number/Name) 1704 / Undersea Warfare					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ASW Concept Development/Studies	WR	NUWC/Newport : RI	44.915	0.000		0.000		0.000		-		0.000	0.000	44.915	-
ASW Concept Development/Studies	MIPR	SSGC : MS	3.253	0.000		0.000		0.000		-		0.000	0.000	3.253	-
ASW Concept Development/Studies	C/CPFF	UT/ARL : TX	6.752	0.000		0.000		0.000		-		0.000	0.000	6.752	-
ASW Concept Development/Studies	C/CPFF	VAR : VAR*	34.522	0.324	Dec 2021	0.355	Dec 2022	0.364	Dec 2023	-		0.364	Continuing	Continuing	Continuing
Subtotal			170.244	0.999		1.080		1.089		-		1.089	Continuing	Continuing	N/A
Remarks															
*Consists of multiple performing activities with funding for each not greater than \$1M per year.															
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	ONR : VA	5.500	0.000		0.000		0.000		-		0.000	0.000	5.500	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	C/CPFF	JHU/APL : MD	4.462	0.000		0.000		0.000		-		0.000	0.000	4.462	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	C/CPFF	UT/ARL : TX	2.000	0.000		0.000		0.000		-		0.000	0.000	2.000	-
Subtotal			11.962	0.000		0.000		0.000		-		0.000	0.000	11.962	N/A
Remarks															
*Consists of multiple performing activities with funding for each not greater than \$1M per year.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603553N / Surface ASW				Project (Number/Name) 1704 / Undersea Warfare					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support - Acquisition, Business & Finance	C/CPAF	EG&G : VA	2.050	0.000		0.000		0.000		-		0.000	0.000	2.050	-
Program Management Support - Acquisition, Business & Finance	C/CPAF	BAE Systems : MD	4.824	0.000		0.000		0.000		-		0.000	0.000	4.824	-
Program Management Support - Systems Engineering and Technical Assistance (SETA)	C/CPFF	CGI Federal : VA	1.751	0.000		0.000		0.000		-		0.000	0.000	1.751	-
Program Management Support - Systems Engineering and Technical Assistance (SETA)	C/CPFF	KMS Solutions* : VA	0.100	0.100	Mar 2022	0.100	Dec 2022	0.100	Dec 2023	-		0.100	Continuing	Continuing	Continuing
Program Office Travel	Allot	NAVSEA PEO IWS 5 : DC	0.350	0.000		0.000		0.000		-		0.000	0.000	0.350	-
Subtotal			9.075	0.100		0.100		0.100		-		0.100	Continuing	Continuing	N/A
Remarks															
*In addition to program office support, KMS Solutions provides technical planning, systems engineering, and test support. KMS Solutions also provides Subject Matter Experts (SMEs) as members of AN/SQQ-89 Surface Ship Anti-Submarine Warfare (ASW) Combat System Advanced Capability Build (ACB) technical Peer Review Working Groups and Integrated Product Teams (IPTs) in support of designing and refining candidate technologies for inclusion into ACB deliveries.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			191.281	1.099		1.180		1.189		-		1.189	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																						Date: March 2023						
Appropriation/Budget Activity										R-1 Program Element (Number/Name)								Project (Number/Name)										
1319 / 4										PE 0603553N / Surface ASW								1704 / Undersea Warfare										
	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
Project 1704	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Broad Agency Announcement (BAA) Awards																												
Technology Development and Analysis	Technology Development and Analysis																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603553N / <i>Surface ASW</i>	Project (Number/Name) 1704 / <i>Undersea Warfare</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 1704.L24</i>				
Broad Agency Announcement (BAA) Awards: BAA Award - 2022	2	2022	2	2022
Broad Agency Announcement (BAA) Awards: BAA Award - 2023	2	2023	2	2023
Broad Agency Announcement (BAA) Awards: BAA Award - 2024	2	2024	2	2024
Broad Agency Announcement (BAA) Awards: BAA Award - 2025	2	2025	2	2025
Broad Agency Announcement (BAA) Awards: BAA Award - 2026	2	2026	2	2026
Broad Agency Announcement (BAA) Awards: BAA Award - 2027	2	2027	2	2027
Broad Agency Announcement (BAA) Awards: BAA Award - 2028	2	2028	2	2028
Technology Development and Analysis: Technology Development and Analysis	1	2022	4	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	1,394.754	96.405	110.146	88.415	-	88.415	89.074	102.291	91.274	90.827	Continuing	Continuing
0223: Sub Combat System Improvement (ADV)	713.623	53.922	57.691	60.360	-	60.360	61.336	62.917	62.880	62.198	Continuing	Continuing
2033: Adv Submarine Systems Development	602.235	28.859	36.607	28.055	-	28.055	27.738	39.374	28.394	28.629	Continuing	Continuing
2096: Payload Delivery Development	43.632	2.506	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	46.138
3391: SSN/SSGN Survivability Program	35.264	11.118	10.848	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	57.230
9999: Congressional Adds	0.000	0.000	5.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.000

A. Mission Description and Budget Item Justification

This Program Element (PE) supports innovative research and development in submarine Hull, Mechanical and Electrical (HM&E) and combat systems technologies and the subsequent evaluation, demonstration, and validation for submarine platforms. It will increase the submarine technology base and provide subsystem design options not currently feasible. The PE also supports programs transitioning from Science and Technology (S&T), Defense Advanced Research Projects Agency (DARPA), Independent Research & Development (IR&D), and Small Business Innovation Research (SBIR) projects.

DESCRIPTION/JUSTIFICATION BY PROJECT:

PROJECT 0223: The Submarine Combat System Improvement (Advanced) (Non-ACAT) project researches, develops, and tests new sonar, combat system, imaging, and electronic warfare software for Program Executive Office, Undersea Warfare Systems (PEO UWS), delivering approximately thirty (30) new capabilities every other year. The project also develops, tests, and prototypes new sonar arrays for PMS 401, the Submarine Acoustics Program Office in PEO UWS. This project supports Navy Submarine Acoustic Superiority and Technology Insertion (TI) initiatives through the application of advanced development and testing of sensors and sensor processing systems supporting tactical control systems improvements. Improvements are supportive of "Advantage at Sea: Prevailing with Integrated All-Domain Naval Power" and the Chief of Naval Operations (CNO) "Navplan"; addressing all components to include Prevailing in Long-Term Strategic Competition, Operating Across the Competition Continuum, and Delivering Integrated All-Domain Naval Forces. This project addresses threats posed by China, Russia, Iran, and Korea, improved lethality of U.S. Submarine Forces and 3rd Offset Capabilities in the Unmanned and Automated Systems domains.

Project 0223 is comprised of three (3) major efforts: Advanced Processing Builds (APB), Advanced Sensors, and Large Vertical Array (LVA).

APB develops, tests and transitions capabilities for:
- Acoustics, transitioning to AN/BQQ-10;

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development
<div>- Tactical control, transitioning to AN/BYG-1;</div> <div>- Imaging, transitioning to AN/BVY-1; and</div> <div>- Electronic Warfare (EW), transitioning to AN/BLQ-10.</div> <p>Advanced Sensors develops new technologies for hull mounted and towed arrays. Hull mounted array improvements support submarine applications only. Towed array improvements are developed to support submarine, surface and surveillance applications.</p> <p>LVA leverages demonstrated flank array developments to conduct critical testing and analysis needed to improve array performance and develop sensor employment tactics. It introduces new electronic hardware and software applications to enhance array and signal processing performance. These improvements will be incorporated in future LVA builds for Virginia class SSNs and Ohio and Columbia classes of SSBNs as well as backfits. The LVA project also sustains the prototype LVA on USS Maryland.</p> <p>PROJECT 2033: Advanced Submarine Systems Development (ASSD) is a non-acquisition program that develops, matures and tests advanced technologies for successful integration into current and future submarine classes, lowers the technical/cost risks of integrating new technologies prior to acquisition, and speeds the delivery of capability and lethality into the Fleet. ASSD transitions Hull, Mechanical, and Electrical (HM&E) technologies, and future naval concepts from the Science & Technology (S&T) and Research and Development (R&D) communities through the development, maturation, and integration of technology projects to operational submarine platforms for assessment, testing, and evaluation. Once projects have proven their maturity and promise through at-sea demonstration, they are formally transitioned into acquisition Programs of Record (PORs). Additionally, ASSD operates and maintains R&D infrastructure assets that are critical to the long-term design, assessment and construction of modern, stealthy submarine platforms.</p> <p>Project 2033 is comprised of three programmatic budget categories: Strategic Capability R&D Infrastructure, Long Range R&D Investment, and Rapid Technology Development. Strategic infrastructure investments maintain and operate critical, one-of-a-kind undersea warfare R&D assets that enable the design and manufacture of the stealthiest submarines in the world, without the requirement to develop and test at full scale, which is inordinately expensive and risky. Long-range R&D investment is the maturation and prototyping at full scale of long-range (5-10 years) technologies, to enable their readiness for incorporation into existing and future submarines. The objective is to achieve high technology readiness (TRL-7) of the targeted technology so that it can be incorporated into the baseline submarine design during the detail design and construction contract award, and evaluated for back-fit into existing platforms. This is class agnostic technology development that supports the VIRGINIA program, the COLUMBIA program, and the Next Generation Attack Submarine (SSN(X)) programs. Rapid Technology Development projects are efforts designed to rapidly mature higher TRL capabilities and field the particular technology project capability within an 18-30 month window, from program start to submarine at- sea demonstration. Also included in this category are innovative technology transition projects, seedling efforts (<\$800K/year) which assess new technology candidates and keep the submarine and Undersea Warfare (USW) technology pipeline primed. All SUB073/ASSD projects are determined by senior USW leadership and N97 sponsor direction.</p> <p>The Program works with Small Business Innovation Research (SBIR), Small Business Technology Transfer (STTR), Office of Secretary of Defense (OSD), Office of Naval Research (ONR), and Defense Advanced Research Projects Agency (DARPA) organizations to identify and mature technology candidates for integration into current/future submarine classes to provide new/transformational capabilities, while achieving total-ownership cost reductions. Experimentation and demonstration</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023		
<table><tr><td>Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</td><td>R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development</td></tr></table>			Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development			
<p>are also conducted in a joint warfighting context with other services (i.e. Marine Corps, Army, Air Force to enable early assessment of a new technology's warfighting capabilities, and to inform the Fleet and acquisition community on smarter technology-selection decisions. This Program also supports cooperative R&D through Information/Data Exchange Agreements (IEA/ DEA) and joint Project Arrangements (PA) with international Allies, which target core technology maturation, future submarine component concept designs, etc. Major technology developmental efforts within this budget submission include:</p> <p>Strategic Capability Infrastructure</p> <ul style="list-style-type: none">- Large Scale Vehicle (LSV)- Large Scale Vehicle Recapitalization- Intermediate Scale Measurement System (ISMS)- High Gain Measurement System (HGMS)- South Tongue of the Ocean (TOTO) Acoustic Measurement Facility (STAFAC) Recapitalization <p>Long Range R&D Investment</p> <ul style="list-style-type: none">- Advanced Material Propeller (AMP) Technology- Advanced Signature Management- Advanced SSN Technologies- Next Generation Thrust (future propulsor/shafting technologies)- Advanced Hull Treatments <p>Rapid Technology Development</p> <ul style="list-style-type: none">- Innovation Technology Transfer <p>PROJECT 2096: Payload Delivery Development, consists of the Payload Handling System (PHS).</p> <p>Payload Delivery Development is a program used for the integration of large deployable and retrievable payloads with submarines. RDT&EN funding will be used to develop a prototype payload launch and recovery system utilized with submarine large ocean interfaces to accommodate large diameter payloads and offboard systems. The project enables launch and recovery of these systems from submarines. This will provide the Submarine Force with the capability to launch and recover large payloads and offboard systems of various configurations in support of critical Undersea Warfare (USW) missions, providing battle space awareness and extending war-fighting reach in support of Subsea and Seabed Warfare (SSW) mission objectives. This capability has been identified as a key enabler for the following critical USW mission areas: Intelligence, Surveillance, and Reconnaissance (ISR), Anti-Submarine Warfare (ASW), Anti-Surface Warfare (ASUW), Naval Special Warfare (NSW), Mine Warfare, Subsea and Seabed Warfare (SSW), Counter- Autonomous Underwater Vehicle (AUV) Warfare, Electromagnetic Maneuver Warfare (EMMW), Deception, and Non-Lethal Sea Control. This capability is paramount to winning the great power competition emerging between world powers and maintaining dominance in the undersea domain.</p> <p>PROJECT 3391: In 2013, OPNAV N97 established SSN/SSGN Survivability Program (S3P) as a separate project area within ASSD to assure SSN/SSGN survivability and the ability of submarines to complete their joint warfighting missions even if covert mobility is compromised. FY 2018 is the first year of S3P execution as Project</p>				

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603561N / <i>Advanced Submarine System Development</i>
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3391 under ASSD with level funding across the FYDP. PBR 19 proposes technology projects that would help pace world-wide technology advances and red investments so as to track and assess US undersea superiority technology insertion plans and their impact on SSN/SSGN survivability.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	98.921	105.703	98.756	-	98.756
Current President's Budget	96.405	110.146	88.415	-	88.415
Total Adjustments	-2.516	4.443	-10.341	-	-10.341
• Congressional General Reductions	-	-0.557			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	5.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.516	0.000			
• Program Adjustments	0.000	0.000	-11.384	-	-11.384
• Rate/Misc Adjustments	0.000	0.000	1.043	-	1.043

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 9999: *Congressional Adds*

Congressional Add: *Nickle-zinc battery deployment for Virginia class*

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

FY 2022	FY 2023
0.000	5.000
0.000	5.000
0.000	5.000

Change Summary Explanation

FUNDING CHANGES SINCE THE PREVIOUS PRESIDENT'S BUDGET AT THE OVERALL PE LEVEL:

- FY 2022 net decrease of \$-2.516M reflects the Small Business Innovative Research (SBIR) transfer.
- FY 2023 net increase of \$+4.443M reflects the incorporation of \$+5.000M to Project C870 for Nickel-Zinc Battery Deployment to VA Class and \$-0.557M of miscellaneous program/rate adjustments applied to the entire PE.
- FY 2024 net decrease of \$-10.341M reflects the -\$12.796M realignment of funds from Project 3391 to BSO 30 (Strategic Systems Programs); the \$+1.400M increase to project 0223 for Project Rebound; and \$+1.055M of miscellaneous program/rate adjustments applied to the entire PE.

INFORMATION AT THE PROJECT LEVEL:

PROJECT 0223:

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development	
<p>FUNDING CHANGES: The FY 2023 (\$57.691M) to FY 2024 (\$60.360M) budget increase (\$+2.669M) above the inflation expected with the RDT&EN appropriation is due to the incorporation of Project Rebound in Advanced Processing Build (APB) / Submarine Warfare Federated Tactical Systems (SWTFS).</p> <p>SCHEDULE CHANGES:</p> <ul style="list-style-type: none">- Advanced Processing Build (APB): To stay in alignment with PEO UWS Development, Security, and Operations (DEVSECOPS) production schedules, APB-23 Step 4 At-Sea Test shifted from 1Q25 to 3Q24, APB-23 Transition to PEO UWS Production Programs shifted from 2Q25 to 4Q24, APB-25 Step 4 At-Sea Test shifted from 1Q27 to 3Q26, and APB-25 Transition to PEO UWS Production Programs shifted from 2Q27 to 4Q26.- Advanced Sensors: Completion of Open Architecture Telemetry (OAT) Advanced Development Model (ADM) fabrication has been extended from 2Q23 to 3Q25 for three primary reasons:<ol style="list-style-type: none">1. Budget reductions to the PEO UWS production program caused a re-baseline of the Next Generation Surveillance Array (NGSA) project, which uses OAT.2. Receipt of materials supporting OAT development and fabrication were delayed due to COVID and supply chain issues in FY 2022 and continuing into FY 2023.3. OAT is being developed for its initial application in concert with the NGSA which is being developed by PMS485. For programmatic reasons, PMS485 has extended its development and test schedule for at-sea testing into 3Q25. Project 0223 will take advantage of these delays to construct a Universal Test Harness (UTH) and progress the OAT portion of the array from its original intent as an ADM (TRL 5) to an Engineering Development Model (EDM) (TRL 7).- Project Rebound: This effort commences in FY 2024. <p>PROJECT 2033:</p> <p>FY 2023 (\$36.607M) to FY 2024 (\$28.055M) decrease (\$-8.552M) due to programmed project ramp-down within the Strategic Infrastructure budget pillar, specifically the planned transition of the LSV-2 Electric Motor Drive recapitalization project from the procurement/manufacturing phase to the final onboard testing phase.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development				Project (Number/Name) 0223 / Sub Combat System Improvement (ADV)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0223: Sub Combat System Improvement (ADV)	713.623	53.922	57.691	60.360	-	60.360	61.336	62.917	62.880	62.198	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Submarine Combat System Improvement (Advanced) (Non-ACAT) project addresses technology challenges to improve tactical control in littoral and open ocean environments for a variety of operational missions including peacetime engagement, surveillance, battle space preparation, deterrence, regional sea denial, precision strike, task group support, and ground warfare support. These technologies, developed by Navy technology bases, the private sector, Office of Naval Research (ONR), Future Naval Capabilities (FNC), and the Defense Advanced Research Projects Agency (DARPA) are then transitioned. Prototype hardware/software systems are developed to demonstrate technologically promising system concepts in laboratory and at-sea submarine environments. The Advanced Sensor development program develops and tests new sensors and demonstrates large array configurations. Current efforts are directed at towed array sensor technologies, telemetry, and architecture, to improve reliability and performance while decreasing program life-cycle costs. For large array configurations, Conformal Acoustic Velocity Sonar (CAVES), Wide Aperture Array (WAA), Large Vertical Aperture (LVA), a Bow Conformal Array (BCA), and Large Flank Array (LFA) technologies are also being pursued. The focus of sensor processing technology efforts through the Advanced Processing Build (APB) program will address improvements in imaging, tactical control, Electronic Warfare (EW) and acoustics, including detection, localization, classification, ranging, tracking, situational awareness, tactical decision aids, command decision support tools and displays and other functions essential to mission success. APB will also develop capabilities related to off-hull cueing and coordination with other platforms. Technologies and/or capabilities developed under this Project will be shared, as applicable to reduce costs and optimize reuse, with development programs for surface ship sonar, Advanced Capability Build (ACB) and surveillance platforms, Advanced Surveillance Build (ASB). ACB and APB are managed under a common development process titled AxB. While each platform retains its uniqueness and focus in functional domains essential to mission success, a premium is placed on development of common capabilities and modular architecture technologies to maximize commonality and cost effectiveness.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Advanced Processing Build (APB)	42.672	45.241	46.260	0.000	46.260
Articles:	-	-	-	-	-
Description: Advanced Processing Builds (APBs) adhere to a four step process: Step 1: Algorithm/technology assessment by peer review panels of Subject Matter Experts (SME) to down-select technologies and assist developers with technical guidance. Step 2: Algorithm/technology testing with open and closed data sets to further down-select and refine capabilities prior to integration and testing. Step 3: Land-based system-level testing stimulated by the Submarine Multi-Mission Team Trainer (SMMTT), in a realistic tactical environment.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development		Project (Number/Name) 0223 / Sub Combat System Improvement (ADV)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Step 4: At-sea testing on an operational submarine.						
APB capability priorities are generated by the Submarine Tactical Requirements Group (STRG), a group of senior post-command officers chaired by a Flag Officer, Commander, Undersea Warfare Development Center (UWDC). Priorities are vetted by COMSUBPAC and COMSUBFOR, then provided as requirement by the Chief of Naval Operations (CNO), OPNAV N97. Program Executive Office Undersea Warfare Systems (PEO UWS) provides Milestone Decision Authority (MDA) oversight and approval. Steps 1 and 2 are conducted in a pipeline style, parallel to system integration and production. This makes Steps 1 and 2 independent of any particular Build (e.g APB-21, APB-23, APB-25, etc.) and allows for development of longer lead technologies. The content of a specific APB build (delivered every two years) is then determined through a series of discussions with the Fleet/STRG aimed at selecting the most relevant and mature technologies available in the APB pipeline. Integration at the string and system level is performed followed by Steps 3 and 4, as applicable, and transitioned to production.						
Beginning in FY 2019, the Navy has pursued a transformation across Submarine Warfare Federated Tactical Systems (SWFTS) to maximize cyber-resiliency, improve software quality, and improve the speed of capability delivery and software improvements. The transformation is being accomplished through a transition to a process comprised of a continuous series of 12-week software increments in a DevSecOps environment. This process better aligns with industry practice and enables the SWFTS systems to leverage industry capability improvements in software configuration management, quality control, Artificial Intelligence (AI) and Machine Learning (ML) and other emerging technologies, while also being more responsive to cyber needs. As APB delivers via SWFTS, changes are required in the 0223 Project's software development and integration methodologies to remain synchronized with the production programs. Instead of delivering a stand-alone improved APB to the PEO UWS SWFTS production programs at the end of development (which the production program offices then had to integrate, mature, test, and certify), development capabilities are now being integrated into the latest SWFTS production hardware and software baseline as they are ready, on a continuing basis. This speeds release of these capabilities to the Fleet by many months. Step 3 and Step 4 testing regimes will be maintained.						
FY 2023 Plans: - Conducted Step 4 at-sea testing of APB-21 with tactics and training improvements informed by Step 3 land-based testing. Analyze results to inform Fleet on recommended tactics and training. - Transitioned APB-21 to PEO UWS production programs.						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development		Project (Number/Name) 0223 / Sub Combat System Improvement (ADV)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div><div>- Complete development of major capabilities for APB-23.</div><div>- Refine continuous development, security, and operations (DevSecOps) process and software pipeline in coordination with production program offices.</div><div>- Continue providing assistance to PEO UWS production program offices with evolutionary combat system re-architecture to improve cybersecurity and speed of delivery.</div><div>- Continue development of Machine Learning and Artificial Intelligence (ML/AI), with emphasis on Deep Learning to solve immediate Fleet needs.</div><div>- Continue Step 1 and Step 2 and commence Step 3 land-based testing of capabilities as they are ready in response to Fleet requirements consistent with the multi-year capability development road map.</div><div>- Implement Electronic Warfare (EW) detection improvements against complex signals and integrate off-hull payloads into the Submarine Warfare Federated Tactical Systems (SWFTS) construct and Concept of Employment (COE).</div></div> <div><div>FY 2024 Base Plans:</div><div>- Complete development of remaining capabilities for APB-23.</div><div>- Conduct Step 3 land-based testing of APB-23. The analysis of results will be used to inform improvements to software, tactics, and training.</div><div>- Conduct Step 4 at-sea testing of APB-23 with tactics and training improvements informed by Step 3 land-based testing. Analyze results to inform Fleet customer on recommended tactics and training.</div><div>- Transition APB-23 to PEO UWS production programs.</div><div>- Continue to refine DevSecOps process and software pipeline in coordination with production program offices.</div><div>- Continue providing assistance to PEO UWS production program offices with evolutionary combat system re-architecture to improve cybersecurity and speed of delivery.</div><div>- Continue development of ML/AI, with emphasis on Deep Learning to solve immediate Fleet needs.</div><div>- Commence Step 1 and Step 2 testing of capabilities as they are ready in response to Fleet requirements consistent with the multi-year capability development road map.</div></div> <div><div>FY 2024 OCO Plans:</div><div>N/A</div></div> <div><div>FY 2023 to FY 2024 Increase/Decrease Statement:</div><div>- FY 2023 (\$45.241M) to FY 2024 (\$46.260M) increase (\$+1.019M) is in line with the inflation expected with the RDT&EN appropriation.</div></div>						
Title: Advanced Sensors		7.250	7.400	7.550	0.000	7.550

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development		Project (Number/Name) 0223 / Sub Combat System Improvement (ADV)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Articles:		-	-	-	-	-
<p>Description: Advanced Sensors develops new technologies for hull mounted and towed arrays. Hull mounted array improvements support submarine applications only. Towed array improvements are shared to support surface and surveillance applications.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none">- Continue fabrication of the Open Architecture Telemetry (OAT) Advanced Development Model (ADM) for the Next Generation Surveillance Array (NGSA).- Conduct OAT Critical Design Review (CDR).- Continue fabrication, integration and test of Universal Test Harness (UTH) for NGSA.- Continue to support the development of new active sensors for Bow Conformal Array (BCA) and SSNx.- Develop improved passive sensors with new materials to meet aggressive shock requirements while maintaining sensitivity.- Build test panels for acoustic and shock testing. Conduct acoustic test tank and environmental panel testing of improved Conformal Acoustic Velocity Sonar (CAVES) sensors.- Develop finite element modeling for passive sensors in CAVES matrix.- Develop improved active projectors for BCA use that fit the physical profile, without requiring recesses, using textured ceramics.- Model BCA passive performance in multiple environments with new and existing sensors. <p>FY 2024 Base Plans:</p> <ul style="list-style-type: none">- Continue OAT ADM fabrication of 13X array.- Complete UTH construction.- Begin build-test-build process utilizing the completed UTH to initiate efforts towards design maturation from ADM to Engineering Development Model (EDM).- Initiate OAT First Article Testing (FAT).- Continue supporting PEO UWS production programs in BCA development.- Conduct passive sensor acoustic and shock testing in air and in CAVES matrix.- Conduct active projector testing in air and water.- Continue modeling BCA passive performance.- Update BCA active performance with new sensor. <p>FY 2024 OCO Plans:</p>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development		Project (Number/Name) 0223 / Sub Combat System Improvement (ADV)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: - FY 2023 (\$7.400M) to FY 2024 (\$7.550M) increase (\$+0.150M) is in line with the inflation expected with the RDT&EN appropriation.						
Title: Project Rebound Articles:		0.000 -	0.000 -	1.400 -	0.000 -	1.400 -
FY 2023 Plans: N/A						
FY 2024 Base Plans: This classified effort supports Advanced Processing Build (APB)/Submarine Warfare Federated Tactical Systems (SWTFS) processing.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: - FY 2023 (\$0.000M) to FY 2024 (\$1.400M) increase (\$+1.400M) represents the initiation of Project Rebound.						
Title: Large Vertical Array (LVA) Articles:		4.000 -	5.050 -	5.150 -	0.000 -	5.150 -
Description: LVA provides a critically important SONAR to allow the submarine force to sustain acoustic superiority against the most modern submarines. Three submarines currently have LVAs, and more are programmed each year. LVA development is required to support LVA use in the Fleet, pace the threat, adapt to new Navy strategies, and further develop the revolutionary LVA capability. LVA development sustains and maintains the LVA2 Advanced Development Model (ADM); and plans, conducts and analyzes exercises and tests involving LVA2 and Fleet LVAs. LVA development supports new software capability development, informs tactics development and testing, and provides training input for both the Submarine Learning Center (SLC) and embedded training applications on submarines. Additionally, LVA development identifies, investigates, and resolves LVA-related issues.						
FY 2023 Plans: - Continue conducting at-sea testing events for LVA2 and analyze at-sea test results. - Analyze SSN 790 LVA3 at-sea test results.						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development		Project (Number/Name) 0223 / Sub Combat System Improvement (ADV)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div><div>- Provide data-based inputs from tests and exercises to signal processing development, Submarine Learning Center (SLC), and tactical employment recommendations to Undersea Warfare Development Command (UWDC).</div><div>- Repair known LVA2 equipment failures.</div><div>- Assess LVA noise concerns, collect baseline and longevity data from multiple LVAs, and conduct modeling and experimentation to identify causes and corrective action.</div><div>- Collect array data on faulty or failed array inboard/outboard components if they occur. Document troubleshooting and repair findings for evaluation and provide findings/recommendations to the production programs for Virginia, Ohio, and Columbia Class Submarines.</div><div>- Continue the SSN 688i Conformal Acoustic Velocity Sonar (CAVES) LVA working group with the purpose to develop plans to certify a second source for LVA technology and establish competition for future efforts.</div><div>- Perform analysis/studies, identify requirements, and continue designs for a conceptual prototype for SSN 688i Class Submarines.</div></div> <div><div>FY 2024 Base Plans:</div><div>- Continue conducting at-sea testing events for all LVAs and analyze at-sea test results.</div><div>- Continue making design improvements based on results of SSN 790 LVA3 at-sea test results.</div><div>- Update and provide data-based inputs from tests and exercises to signal processing development, SLC, and tactical employment recommendations to UWDC.</div><div>- Collect array data on faulty or failed array inboard/outboard components if they occur. Document troubleshooting and repair findings for evaluation and provide findings/recommendations to the production programs for Virginia, Ohio, and Columbia Class Submarines.</div><div>- Repair known LVA2 equipment failures.</div><div>- Use results of the SSN 688i CAVES LVA working group to certify a second source for LVA technology establishing competition for future efforts.</div><div>- Perform analysis/studies, identify requirements, and continue designs for a conceptual prototype for SSN 688i Class Submarines.</div><div>- Support installation of production LVA on USS MARYLAND.</div><div>- Continue LVA Flow Noise investigations.</div></div> <div><div>FY 2024 OCO Plans:</div></div>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy								Date: March 2023				
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603561N / <i>Advanced Submarine System Development</i>				Project (Number/Name) 0223 / <i>Sub Combat System Improvement (ADV)</i>				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A												
<i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> - FY 2023 (\$5.050M) to FY 2024 (\$5.150M) increase (\$+0.100M) is in line with the inflation expected with the RDT&EN appropriation.												
Accomplishments/Planned Programs Subtotals								53.922	57.691	60.360	0.000	60.360
C. Other Program Funding Summary (\$ in Millions)												
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>	
• RDTEN/0205620N: <i>Surface ASW Cmbt Sys Integr</i>	27.781	28.999	29.973	-	29.973	30.077	30.542	30.822	31.311	Continuing	Continuing	
• RDTEN/0603562N/0770: <i>Adv Sub Supp Equip Prog</i>	4.571	3.726	7.791	-	7.791	7.728	6.773	5.040	5.047	Continuing	Continuing	
Remarks												
D. Acquisition Strategy												
Use competitively awarded contracts from Broad Agency Announcement (BAA) solicitations, Other Transaction Authority (OTA), and Small Business Innovative Research (SBIR) initiatives. Integration to fielded systems performed under contracts awarded by the recipient production program within PEO UWS.												

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development				Project (Number/Name) 0223 / Sub Combat System Improvement (ADV)					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
APB, LVA, Advanced Sensor Development	C/CPFF	Adaptive Methods : VA	2.399	0.325	Mar 2022	0.350	Dec 2022	0.350	Dec 2023	-		0.350	Continuing	Continuing	Continuing
APB, LVA, Advanced Sensor Development	C/CPFF	Alion Sciences : VA	3.267	0.000		0.000		0.000		-		0.000	0.000	3.267	-
APB, LVA, Advanced Sensor Development	C/CPFF	Arete : CA	0.550	0.000		0.000		0.000		-		0.000	0.000	0.550	-
APB, LVA, Advanced Sensor Development	C/CPFF	Chesapeake Science (L-3) : MD	7.551	0.000		0.000		0.000		-		0.000	0.000	7.551	-
APB, LVA, Advanced Sensor Development	C/CPFF	Electric Boat : ME	1.980	2.125	Mar 2022	2.330	Dec 2022	2.350	Dec 2023	-		2.350	Continuing	Continuing	Continuing
APB, LVA, Advanced Sensor Development	C/CPFF	General Dynamics : VA	30.783	2.151	Mar 2022	2.225	Dec 2022	2.250	Dec 2023	-		2.250	Continuing	Continuing	Continuing
APB, LVA, Advanced Sensor Development	C/CPFF	GA Tech Research Institute : GA	3.957	0.415	Jan 2022	0.450	Dec 2022	0.450	Dec 2023	-		0.450	Continuing	Continuing	Continuing
APB, LVA, Advanced Sensor Development	C/CPFF	In Depth Engineering : VA	9.411	1.025	Mar 2022	1.165	Dec 2022	1.175	Dec 2023	-		1.175	Continuing	Continuing	Continuing
APB, LVA, Advanced Sensor Development	C/CPFF	JHU/APL : MD	136.669	11.350	Jan 2022	11.825	Dec 2022	11.975	Dec 2023	-		11.975	Continuing	Continuing	Continuing
APB, LVA, Advanced Sensor Development	C/CPFF	Lockheed Martin : VA	110.226	11.175	Nov 2021	11.905	Dec 2022	12.100	Dec 2023	-		12.100	Continuing	Continuing	Continuing
APB, LVA, Advanced Sensor Development	C/CPFF	Lockheed Martin : NY	10.664	0.000		0.000		0.000		-		0.000	0.000	10.664	-
APB, LVA, Advanced Sensor Development	C/CPFF	Metron : VA	11.798	0.815	Jan 2022	0.865	Dec 2022	0.905	Dec 2023	-		0.905	Continuing	Continuing	Continuing
APB, LVA, Advanced Sensor Development	C/CPAF	NSMA : VA	14.944	0.700	Jan 2022	0.750	Jan 2023	0.750	Jan 2024	-		0.750	Continuing	Continuing	Continuing
APB, LVA, Advanced Sensor Development	WR	NSWC/Carderock : MD	39.483	2.775	Oct 2021	2.695	Nov 2022	2.725	Nov 2023	-		2.725	Continuing	Continuing	Continuing
APB, LVA, Advanced Sensor Development	WR	NUWC/Newport : RI	136.043	9.225	Oct 2021	9.100	Nov 2022	9.250	Nov 2023	-		9.250	Continuing	Continuing	Continuing
APB, LVA, Advanced Sensor Development	WR	ONI : DC	2.295	0.000		0.000		0.000		-		0.000	0.000	2.295	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development				Project (Number/Name) 0223 / Sub Combat System Improvement (ADV)					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
APB, LVA, Advanced Sensor Development	WR	ONR : VA	2.725	0.000		0.000		0.000		-		0.000	0.000	2.725	-
APB, LVA, Advanced Sensor Development	C/CPFF	Progeny : VA	10.146	0.700	Mar 2022	0.715	Dec 2022	0.725	Dec 2023	-		0.725	Continuing	Continuing	Continuing
APB, LVA, Advanced Sensor Development	C/CPFF	PSU/ARL : PA	13.163	0.700	Jan 2022	0.715	Dec 2022	0.725	Dec 2023	-		0.725	Continuing	Continuing	Continuing
APB, LVA, Advanced Sensor Development	C/CPFF	SAIC : VA	3.555	0.000		0.000		0.000		-		0.000	0.000	3.555	-
APB, LVA, Advanced Sensor Development	C/CPFF	Sedna Digital : VA	21.444	2.175	Feb 2022	2.175	Dec 2022	2.200	Dec 2023	-		2.200	Continuing	Continuing	Continuing
APB, LVA, Advanced Sensor Development	WR	SSC/San Diego : CA	1.963	0.000		0.000		0.000		-		0.000	0.000	1.963	-
APB, LVA, Advanced Sensor Development	MIPR	U.S. Army Research Lab : MD	1.700	0.000		0.000		0.000		-		0.000	0.000	1.700	-
APB, LVA, Advanced Sensor Development	MIPR	U.S. Army/MITRE : NJ	4.595	0.000		0.000		0.000		-		0.000	0.000	4.595	-
APB, LVA, Advanced Sensor Development	MIPR	U.S. Hanscom AFB/ MIT Lincoln Labs : MA	28.914	2.775	Feb 2022	2.975	Dec 2022	3.025	Dec 2023	-		3.025	Continuing	Continuing	Continuing
APB, LVA, Advanced Sensor Development	C/CPFF	UT/ARL : TX	38.006	2.145	Jan 2022	2.255	Dec 2022	2.275	Dec 2023	-		2.275	Continuing	Continuing	Continuing
APB, LVA, Advanced Sensor Development	C/CPFF	VAR : VAR*	38.799	1.431	Nov 2021	3.226	Dec 2022	3.760	Dec 2023	-		3.760	Continuing	Continuing	Continuing
Project Rebound Development	C/CPFF	VAR : VAR*	0.000	0.000		0.000		1.400	Nov 2023	-		1.400	0.000	1.400	-
Subtotal			687.030	52.007		55.721		58.390		-		58.390	Continuing	Continuing	N/A
Remarks															
* Consists of multiple performing activities with funding for each not greater than \$1M per year.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development						Project (Number/Name) 0223 / Sub Combat System Improvement (ADV)			
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support - Acquisition, Business & Finance	C/CPFF	EG&G (URS) : VA	4.291	0.000		0.000		0.000		-		0.000	0.000	4.291	-
Program Management Support - Acquisition, Business & Finance	C/CPAF	BAE Systems : MD	12.665	0.000		0.000		0.000		-		0.000	0.000	12.665	-
Program Management Support - Systems Engineering and Technical Assistance (SETA)	C/CPFF	CGI Federal : VA	6.818	0.000		0.000		0.000		-		0.000	0.000	6.818	-
Program Management Support - Systems Engineering and Technical Assistance (SETA)	C/CPFF	KMS Solutions* : VA	1.761	1.850	Mar 2022	1.900	Dec 2022	1.900	Dec 2023	-		1.900	Continuing	Continuing	Continuing
Program Office Travel	Allot	NAVSEA PEO IWS5 : DC	1.058	0.065	Oct 2021	0.070	Oct 2022	0.070	Oct 2023	-		0.070	Continuing	Continuing	Continuing
Subtotal			26.593	1.915		1.970		1.970		-		1.970	Continuing	Continuing	N/A
Remarks															
* In addition to program office support, KMS Solutions provide technical planning, systems engineering, and test support. KMS Solutions also provide Subject Matter Experts (SMEs) as members of the Advanced Processing Build (APB) technical Peer Review Working Groups and Integrated Product Teams (IPTs) in support of designing and refining candidate technologies for inclusion into APB deliveries.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			713.623	53.922		57.691		60.360		-		60.360	Continuing	Continuing	N/A
Remarks															

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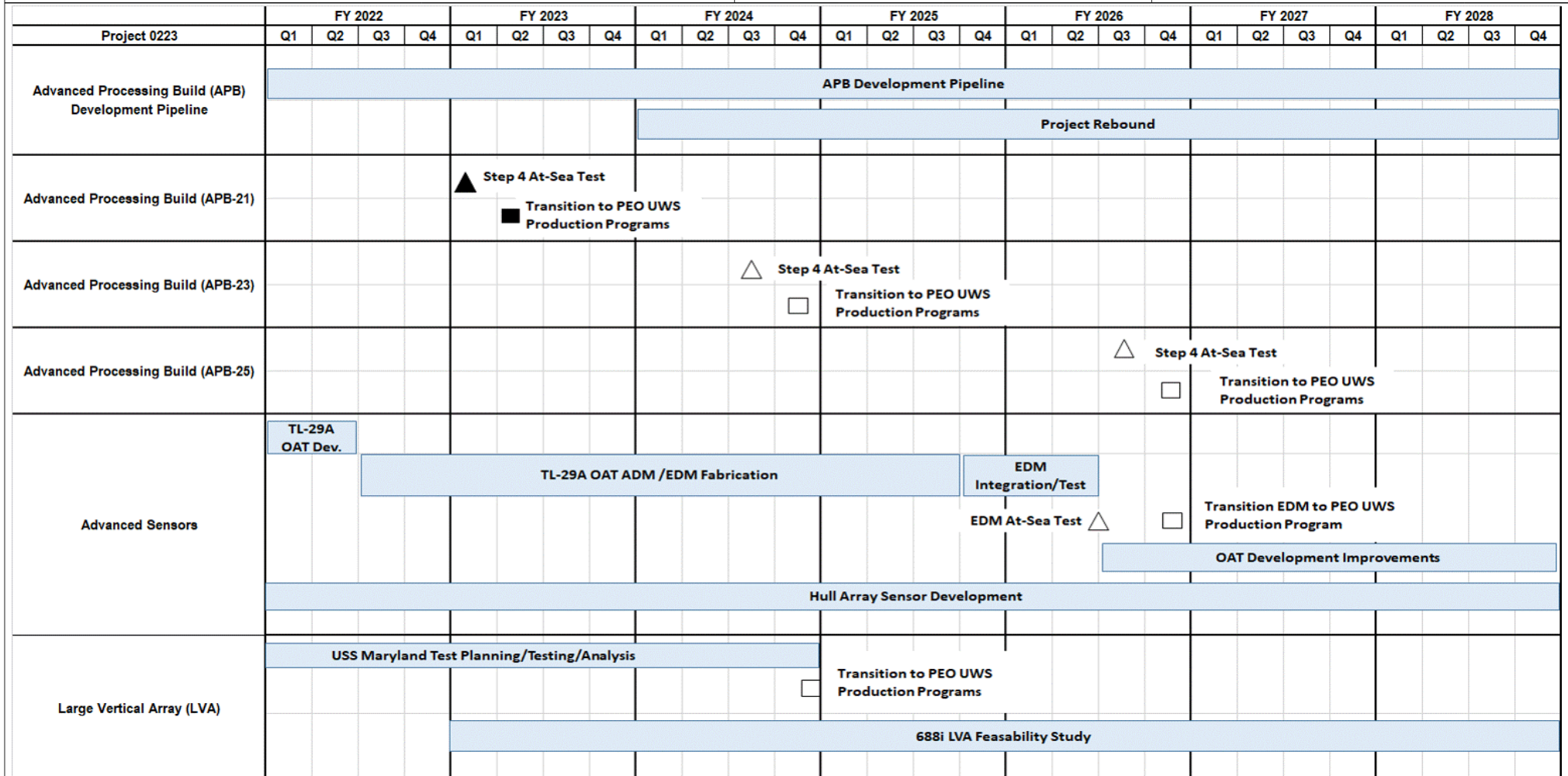
Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0603561N / Advanced Submarine System Development

Project (Number/Name)
0223 / Sub Combat System Improvement (ADV)



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603561N / Advanced Submarine System Development

Project (Number/Name)

0223 / Sub Combat System Improvement (ADV)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 0223				
Advanced Processing Build (APB): APB Development Pipeline	1	2022	4	2028
Advanced Processing Build (APB): Project Rebound	1	2024	4	2028
APB-21: At-Sea Test	1	2023	1	2023
APB-21: Transition to PEO UWS Production Programs	2	2023	2	2023
APB-23: At-Sea Test	3	2024	3	2024
APB-23: Transition to PEO UWS Production Programs	4	2024	4	2024
APB-25: At-Sea Test	3	2026	3	2026
APB-25: Transition to PEO UWS Production Programs	4	2026	4	2026
Advanced Sensors: Hull Array Sensor Development	1	2022	4	2028
Advanced Sensors: TL-29A OAT Development	1	2022	2	2022
Advanced Sensors: TL-29A OAT ADM/EDM Fabrication	3	2022	3	2025
Advanced Sensors: TL-29A OAT EDM Integration/Test	4	2025	2	2026
Advanced Sensors: TL-29A OAT EDM At-Sea Test	2	2026	2	2026
Advanced Sensors: TL-29A OAT EDM Transition	4	2026	4	2026
Advanced Sensors: OAT Development Improvements	3	2026	4	2028
Large Vertical Array (LVA): USS Maryland Test Planning/Testing/Analysis	1	2022	4	2024
Large Vertical Array (LVA): USS Maryland Transition to PEO UWS Production Program	4	2024	4	2024
Large Vertical Array (LVA): 688i LVA Feasibility Study	1	2023	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603561N / <i>Advanced Submarine Systems Development</i>				Project (Number/Name) 2033 / <i>Adv Submarine Systems Development</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2033: <i>Adv Submarine Systems Development</i>	602.235	28.859	36.607	28.055	-	28.055	27.738	39.374	28.394	28.629	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Advanced Submarine Systems Development (ASSD) is a non-acquisition program that develops, matures and tests advanced technologies for successful integration into current and future submarine classes, lowers the technical/cost risks of integrating new technologies prior to acquisition, and speeds the delivery of capability and lethality to the Fleet.

ASSD transitions Hull, Mechanical, and Electrical (HM&E) technologies, and future naval concepts from the Science & Technology (S&T) and Research and Development (R&D) communities through the development, maturation, and integration of technology projects to operational submarine platforms for assessment, testing, and evaluation. Once projects have proven their maturity and promise through at-sea demonstration, they are formally transitioned into acquisition Programs Of Record (PORs). Additionally, ASSD operates and maintains strategic R&D infrastructure and measurement assets that are critical to the long-term design, assessment and construction of modern, stealthy submarine platforms.

Project 2033 is comprised of three programmatic budget categories: Strategic Capability R&D Infrastructure, Long Range R&D Investment, and Rapid Technology Development. Strategic infrastructure investments maintain and operate critical, one-of-a-kind undersea warfare R&D assets that enable the design and manufacture of the stealthiest submarines in the world, without the requirement to develop and test at full scale, which is inordinately expensive and risky. Long-range R&D investment is the maturation and prototyping at full scale of long-range (5-10 years) technologies, to enable their readiness for incorporation into existing and future submarines. The objective is to achieve high technology readiness (TRL-7) of the targeted technology so that it can be incorporated into the baseline submarine design during the detailed design and construction contract award, and evaluated for back-fit into existing platforms. This is class agnostic technology development that supports the VIRGINIA program, COLUMBIA program, and the Next Generation Attack Submarine (SSN(X)) programs. Rapid Technology Development projects are efforts designed to rapidly mature higher TRL capabilities and field the particular technology project capability within an 18-30 month window, from program start to submarine at-sea demonstration. Also included in this category are innovative technology transition projects, seedling efforts (<\$800K/year) which assess new technology candidates and keep the submarine and Undersea Warfare (USW) technology pipeline primed. All SUB073/ASSD projects are determined by senior USW leadership and N97 sponsor direction.

The Program works with Small Business Innovation Research (SBIR), Small Business Technology Transfer (STTR), Office of Secretary of Defense (OSD), Office of Naval Research (ONR), and Defense Advanced Research Projects Agency (DARPA) organizations to identify and mature technology candidates for integration into current/future submarine classes to provide new/transformational capabilities, while achieving total-ownership cost reductions. Experimentation and demonstration are also conducted in a joint warfighting context with other services (i.e. Marine Corps, Army, Air Force) to enable early assessment of a new technology's warfighting capabilities, and to inform the Fleet and acquisition community on smarter technology-selection decisions. This Program also supports cooperative R&D through

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023				
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603561N / <i>Advanced Submarine System Development</i>	Project (Number/Name) 2033 / <i>Adv Submarine Systems Development</i>				
Information/Data Exchange Agreements (IEA/ DEA) and joint Project Arrangements (PA) with international Allies, which target core technology maturation, future submarine component concept designs, etc. Major technology developmental efforts within this budget submission include:						
Strategic Capability R&D Infrastructure - Large Scale Vehicle (LSV) - Large Scale Vehicle Recapitalization - Intermediate Scale Measurement System (ISMS) - High Gain Measurement System (HGMS) - South TOTO Acoustic Measurement Facility (STAFAC) Recapitalization						
Long Range R&D - Advanced Hull Treatments - Next Generation Thrust (future propulsor/shafting technologies, materials, and designs) - Advanced Material Propeller - Advanced SSN Technologies - Advanced Energy (Submarine Main Storage Battery - NiZn alternative chemistry) - Advanced Signature Management						
Rapid Technology Development - Innovative Technology Transfer						
FY23 to FY24 decrease due to programmed project ramp-down within the Strategic Infrastructure budget pillar, specifically the planned transition of the LSV-2 Electric Motor Drive recapitalization project from the procurement/manufacturing phase to the final onboard testing phase.						
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Strategic Capability R&D Infrastructure		20.201	30.511	21.543	0.000	21.543
Articles:		-	-	-	-	-
Description: Sustains Navy R&D capability for continued operations of the Large Scale Vehicle (LSV), Intermediate Scale Measurement System (ISMS), and High Gain Measurement System (HGMS) test facilities in support of VIRGINIA and COLUMBIA Class Programs, numerous other smaller programs, and future submarine technology development. These facilities are a critical enabler supporting the conduct of large-scale model experiments and focus on evaluating the stealth, control, affordability, and operational effectiveness of new submarine technologies. The technology validation provided by the model experiments has provided significant cost and schedule savings by allowing prototyping at scale, vice with first-of-hull assets.						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development		Project (Number/Name) 2033 / Adv Submarine Systems Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>This project also funds STAFAC Recapitalization, which modernizes the existing South Toto Acoustic Measurement Facility (STAFAC), which is currently at its 15 year design life. Project provides a lifecycle replacement of acoustic measurement system and inserts new capabilities and data transfer technology required to support the measurement and assessment of COLUMBIA and other future submarine platforms to ensure their stealth. The project additionally funds LSV2 Recapitalization, which is constructing a full ship set of electric drive modules based on the original system design, extending LSV2 lifetime beyond 2040 at lowest cost and technical risk.</p> <p>FY 2023 Plans: LSV-2: Conduct LSV-2 core ship systems maintenance, maintain crew qualification, ensure compliance with all LSVSAFE and general regulations. Maintain and operate acoustic data navigation and control systems and all required shore support systems. Execute testing as required for Integrated Shaft trial. In support of LSV-2 drive recapitalization process, conduct 1st article builds and testing for new electric drive modules (inverters and converters). Implement replacement of INU with modern COTS/integrated system. Complete LSV2 driveline alignment with motor mount hardware and replacement flex-coupling. Continue Electronic Drive Control Electronics (EDCE) redesign, testbed update, and system sustainment planning.</p> <p>ISMS: Continue ongoing system refurbishment and replacement on ISMS. Operate and maintain ISMS acoustic test range underwater and shore-based facilities. Continue support of structural acoustics, target strength and radiated noise measurements in support of COLUMBIA, VIRGINIA, SSN(X), ONR, and other fleet needs.</p> <p>HGMS: Operate and maintain HGMS acoustic test range underwater and shore-based facilities in support of highly accurate acoustic data from LSV2 operations.</p> <p>STAFAC Recapitalization: Finalize procurement specifications and initiate component lab test and integration.</p> <p>FY 2024 Base Plans: LSV-2: Complete LSV-2 drive recapitalization process including delivery of all drive units. Continue updates to Electronic Drive Control Electronics (EDCE) testbed and continue EDCE and motor drive sustainment initiatives.</p>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development		Project (Number/Name) 2033 / Adv Submarine Systems Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
ISMS: Continue ongoing system refurbishment and replacement on ISMS. Operate and maintain ISMS acoustic test range underwater and shore-based facilities. Continue support of structural acoustics, target strength and radiated noise measurements in support of COLUMBIA, VIRGINIA, SSN(X), ONR, and other fleet needs.						
HGMS: Operate and maintain HGMS acoustic test range underwater and shore-based facilities in support of highly accurate acoustic data from LSV2 operations; begin work toward mid-life recapitalization of the range.						
STAFAC Recapitalization: Efforts include testing of the first article High Frequency Volumetric Array and required post-test design assessments, subsystem electronics and interface testing for array and tracking components, and acoustic sensor characterization for the volumetric arrays. Initiate software development for new beamforming capabilities and accelerated life testing of in-water components such as the array power supplies.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to programmed project ramp-down as LSV-2 Electric Motor Drive recapitalization project transitions from the procurement/manufacturing phase to the final onboard testing phase.						
Title: Long Range R&D		8.583	5.796	6.200	0.000	6.200
Articles:		-	-	-	-	-
Description: Develop advanced technologies and tools to increase current and future submarine capabilities, lower acquisition and life-cycle costs, and enhance survivability. Develop technologies and materials that facilitate new and enhance existing warfighting concepts. The program currently supports development of advanced submarine hull coatings for improved acoustic performance, maintainability and cost, with the objective of near-term implementation on VIRGINIA and COLUMBIA Class platforms, as well as future submarine classes. The budget line continues to develop technologies for alternative propulsion/propulsor designs to enhance submarine performance, maneuverability and stealth while reducing submarine acquisition costs. This long-range R&D effort continues to develop and demonstrate technologies for future submarines in areas of hull and platform technologies, propulsors, propellers, corrosion control, ship control, electric actuation, sensors, survivability, and other systems which increase near-term capability and provide cost reduction for in-service and future submarine classes.						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023				
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development	Project (Number/Name) 2033 / Adv Submarine Systems Development				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>FY 2023 Plans:</p> <p>ADVANCED HULL TREATMENTS: Evaluate at sea performance of advanced hull treatment (VCS Hull C), during post drydocking acoustic trial. Continue collaboration with NSWC Carderock and ONR ManTech to assess performance and mature manufacturability of emerging Low Technology Readiness Level hull treatment materials.</p> <p>ADVANCED SIGNATURE MANAGEMENT (ASM): Prototyping: Continue to Develop Concept of Operation (CONOP)/procedural guidance for ASM integration into Ship Systems. Project Arrangements: Continue data analysis of FY22 At Sea Demonstration and shore-based testing/modeling results, and the integration of Audient software algorithm into ship systems for continued testing. Continue collaborative partnership with ONR in support of ONR Own Ship Acoustic Monitoring (OSAM) FNC and initiate preparation for FY24 At Sea Shakedown testing. Continue collaborative planning for deferred Partner Underwater Electro-Magnetic (UEM) Measurement Trials in FY24 (pending test asset availability).</p> <p>NEXT GENERATION THRUST (NGT): Continue design exploration for full-scale composite shafting. Continue development of Generation 1 of the New SSN propulsor design. Continue tool design improvement initiatives in support of New SSN propulsion technology development. Continue scale-model planning, testing, and upgrades to testing facilities.</p> <p>ADVANCED MATERIAL PROPELLER (AMP): Conduct follow-on destructive/non-destructive testing and analysis of full-scale propeller data per follow-on Project Arrangement.</p> <p>ADVANCED SSN TECHNOLOGIES: Continue assessment of new technologies for future submarines in support of the Tactical Submarine Evolution Plan (TSEP) and continue studies to assess potential impacts on platform capability. Complete calibration and perform surface flow measurements of surfaces of interest in the LCC with the measurement test bed.</p> <p>ADVANCED ENERGY: Continue planned NSWC Crane testing of COTS batteries and platform integration studies to assess Nickel Zinc (NiZn) suitability for submarine Main Storage Battery utilization. Support transition of NAVSEA lead for NiZn battery R&D to the VIRGINIA Class Program Office (PMS450) in support of VA Block VII design space exploration.</p> <p>FY 2024 Base Plans:</p>							

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development	Project (Number/Name) 2033 / Adv Submarine Systems Development			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
ADVANCED HULL TREATMENTS: Mature next generation hull treatments in coordination with ONR ManTech and continuing development of and maturing hull treatment.						
ADVANCED SIGNATURE MANAGEMENT (ASM): Prototyping: Continue CONOP and procedural guidance development for ASM integration into Ship Systems. Finalize planning and execute At-Sea Shakedown demonstration in support of ONR Own Ship Acoustic Monitoring (OSAM) FNC. Conduct data analysis on Shakedown demo and planning/preparation for follow-on Refinement demo in support of ONR Own Ship Acoustic Monitoring (OSAM) FNC. Complete collaborative planning for deferred Partner Underwater Electro-Magnetic (UEM) Measurement Trials in support of late FY24 execution (pending partner test asset availability).						
NEXT GENERATION THRUST (NGT): Begin design concepts for full-scale composite shafting. Continue development of Generation 1 of the New SSN propulsor design and conduct scale-model testing of Gen 1 designs. Begin development of Generation 2 of the New SSN propulsor design. Continue tool design improvement initiatives in support of New SSN propulsion technology development. Continue scale-model planning, testing, and upgrades to testing facilities.						
ADVANCED MATERIAL PROPELLER (AMP): Continue follow-on destructive/non-destructive testing and analysis of full-scale propeller data per follow-on Project Arrangement.						
ADVANCED SSN TECHNOLOGIES: Continue assessment of new and adapted technologies for future submarine use in support of the Tactical Submarine Evolution Plan (TSEP). Continue studies to assess potential impacts on platform capability and challenges to ship integration. Conduct modeling and prototyping to identify and evaluate technology solutions for In-Service stealth issues.						
ADVANCED ENERGY: Project transitioned to the VIRGINIA Class Program Office (PMS450).						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: Increase from FY23 to FY24 due to material testing phase of the Advanced Material Propeller (AMP) project.						
Title: Rapid Technology Development		0.075	0.300	0.312	0.000	0.312
Articles:		-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603561N / <i>Advanced Submarine System Development</i>		Project (Number/Name) 2033 / <i>Adv Submarine Systems Development</i>	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Description: Conduct Navy and joint demonstrations of advanced technologies to assess the operational value of the technologies/systems under consideration, and speed transition of operational capabilities. Coordinate with new construction and in-service program offices to synchronize ship technology demonstration and insertion with design/delivery timelines.</p> <p>FY 2023 Plans: Continue to leverage products and analysis from Naval Laboratories, Small Business (SBIR/STTR), industry Independent Research and Development (IRAD), and Foreign Comparative Testing efforts to identify/develop innovative submarine and USW technology transition project candidates. FY 22 planned projects include prototype sensor and component development in support of measurement ranges.</p> <p>FY 2024 Base Plans: Continue to leverage products and analysis from Naval Laboratories, Small Business (SBIR/STTR), industry Independent Research and Development (IRAD), and Foreign Comparative Testing efforts to identify/develop innovative submarine and USW technology transition project candidates.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Minor increase due to miscellaneous program adjustments.</p>					
Accomplishments/Planned Programs Subtotals	28.859	36.607	28.055	0.000	28.055

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• OPN/0941: <i>Submarine Support Equipment</i>	88.284	116.575	112.526	-	112.526	75.149	78.982	87.445	79.308	Continuing	Continuing
Remarks A portion of the funding required for the STAFAC Recapitalization project is included within the OPN project above.											

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603561N / <i>Advanced Submarine System Development</i>	Project (Number/Name) 2033 / <i>Adv Submarine Systems Development</i>
<p>D. Acquisition Strategy</p> <p>Non-ACAT program with BA4 R&D investment. Projects transition via formal processes to acquisition programs of record for inclusion into existing ship baselines or insertion as capability upgrades. Concept Formulation (CONFORM) contracts with the only two submarine design/construction shipyards, General Dynamics Electric Boat (GDEB) and Huntington Ingalls Industries Newport News Shipbuilding (HII-NNS) facilitate this process. Engagement with industry via competitively awarded Small Business Innovation Research (SBIR) and topic-specific Broad Agency Announcement (BAA) contracts are used to build vendor base and support development of R&D products for enhanced submarine capability in the areas of advanced Hull Mechanical & Electrical (HM&E) technology, stealth improvements and payload system development. Program leverages technical analysis and prototyping support from University Affiliated Research Centers (UARCs), such as Penn State University Applied Research Laboratory, Johns Hopkins University Applied Physics Laboratory and University of Washington Applied Physics Laboratory via NAVSEA UARC contract vehicles. Program utilizes Interagency Agreements with National Laboratories, such as Oak Ridge National Laboratory, as needed, to leverage their unique technical competencies in energy, sensing systems, materials and advanced/additive manufacturing.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603561N / <i>Advanced Submarine System Development</i>				Project (Number/Name) 2033 / <i>Adv Submarine Systems Development</i>					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/FFP	DRS Technologies : Milwaukee, WI	9.840	0.000		7.000	Nov 2022	0.000		-		0.000	0.000	16.840	-
Product Development	WR	NSWC Crane : Crane, IN	0.935	0.301	Dec 2021	0.307	Dec 2022	0.000	Dec 2023	-		0.000	0.000	1.543	-
Product Development	WR	NSWC PHILLY : Philly, PA	1.100	0.375	Nov 2021	0.383	Nov 2022	0.135	Nov 2023	-		0.135	Continuing	Continuing	Continuing
Product Development	WR	NRL : Washington, DC	3.109	0.104	Nov 2021	0.106	Dec 2022	0.108	Dec 2023	-		0.108	0.000	3.427	-
Product Development	SS/CPFF	HII : Newport News, VA	24.884	1.671	Jan 2022	1.704	Jan 2023	0.450	Jan 2024	-		0.450	Continuing	Continuing	Continuing
Product Development	SS/CPFF	EB : Groton, CT	89.463	3.521	Jan 2022	3.591	Jan 2023	1.299	Jan 2024	-		1.299	Continuing	Continuing	Continuing
Product Development	WR	NSWC : Carderock, MD	110.079	4.809	Nov 2021	5.166	Nov 2022	6.041	Nov 2023	-		6.041	Continuing	Continuing	Continuing
Product Development	FFRDC	ARL/PSU : State College, PA	12.463	1.339	Apr 2022	1.480	Feb 2023	1.393	Feb 2024	-		1.393	Continuing	Continuing	Continuing
Product Development	FFRDC	JHU/APL : Laurel, MD	25.176	0.260	Apr 2022	0.265	Feb 2023	0.310	Jan 2024	-		0.310	Continuing	Continuing	Continuing
Product Development	Various	Various : Various	37.294	0.302	Jan 2022	0.308	Feb 2023	0.314	Jan 2024	-		0.314	Continuing	Continuing	Continuing
Product Development	WR	NUWC : Newport, RI	81.456	0.000	Nov 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	FFRDC	APL/University of Washington : Seattle, WA	0.000	0.521	Nov 2021	0.531	Dec 2022	0.544	Dec 2023	-		0.544	0.000	1.596	-
Product Development	SS/CPFF	Leidos : Reston, Va	0.000	0.535	Feb 2022	1.567	Nov 2022	1.569	Nov 2023	-		1.569	0.000	3.671	-
Subtotal			395.799	13.738		22.408		12.163		-		12.163	Continuing	Continuing	N/A
Remarks															
FY23 to FY24 decrease for DRS due to completion of LSV Recap efforts, along with associated efforts at GDEB.															
FY23 to FY24 decrease to NSWC Crane due to transition of Advanced Energy project to the VIRGINIA Class Program Office.															
Various/VAR is used to group multiple activities with small funding levels.															

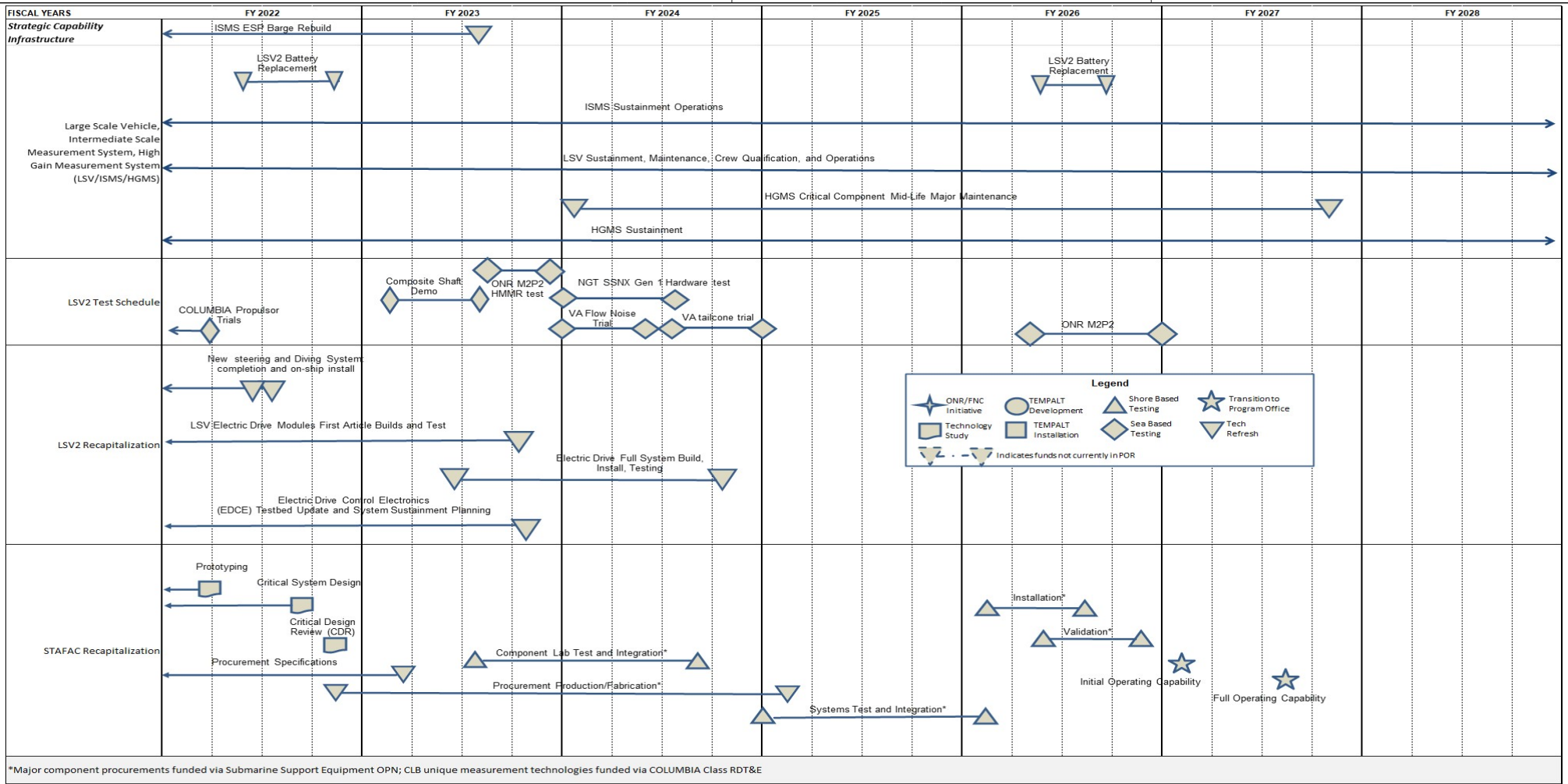
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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development				Project (Number/Name) 2033 / Adv Submarine Systems Development					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	SS/CPFF	Various : Various	20.066	1.140	Mar 2022	1.163	Jan 2023	1.146	Jan 2024	-		1.146	Continuing	Continuing	Continuing
Government Engineering Support	WR	Various : Various	8.684	0.587	Oct 2021	0.599	Oct 2022	0.807	Oct 2023	-		0.807	Continuing	Continuing	Continuing
Travel	WR	NAVSEA HQ : Not Specified	1.523	0.110	Oct 2021	0.090	Oct 2022	0.110	Oct 2023	-		0.110	Continuing	Continuing	Continuing
Subtotal			30.273	1.837		1.852		2.063		-		2.063	Continuing	Continuing	N/A
Remarks Various/VAR is used to group multiple activities with small funding levels.															
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	C/CPFF	GDIT : Bayview, ID	6.200	1.800	Nov 2021	1.836	Nov 2022	2.216	Nov 2023	-		2.216	0.000	12.052	-
Developmental Test & Evaluation (DT&E)	SS/CPFF	EB : Groton, CT	39.341	3.979	Jan 2022	2.856	Jan 2023	3.338	Jan 2024	-		3.338	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NSWC/PHILLY : PHILLY, PA	10.317	0.503	Nov 2021	0.513	Nov 2022	0.572	Nov 2023	-		0.572	0.000	11.905	9.104
Developmental Test & Evaluation (DT&E)	Various	Various : Various	10.799	0.717	Mar 2022	0.731	Mar 2023	0.746	Mar 2024	-		0.746	0.000	12.993	6.372
Developmental Test & Evaluation (DT&E)	WR	NUWC : Newport, RI	33.225	0.426	Nov 2021	0.435	Nov 2022	0.493	Nov 2023	-		0.493	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NSWC : Carderock, MD	69.131	4.500	Nov 2021	4.590	Nov 2022	4.997	Nov 2023	-		4.997	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	SS/CPFF	HII : Newport News, VA	6.400	0.618	Jan 2022	0.630	Jan 2023	0.643	Jan 2024	-		0.643	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	SS/CPFF	JHU/APL : Laurel, MD	0.750	0.741	Apr 2022	0.756	Apr 2023	0.824	Apr 2024	-		0.824	0.000	3.071	-
Subtotal			176.163	13.284		12.347		13.829		-		13.829	Continuing	Continuing	N/A

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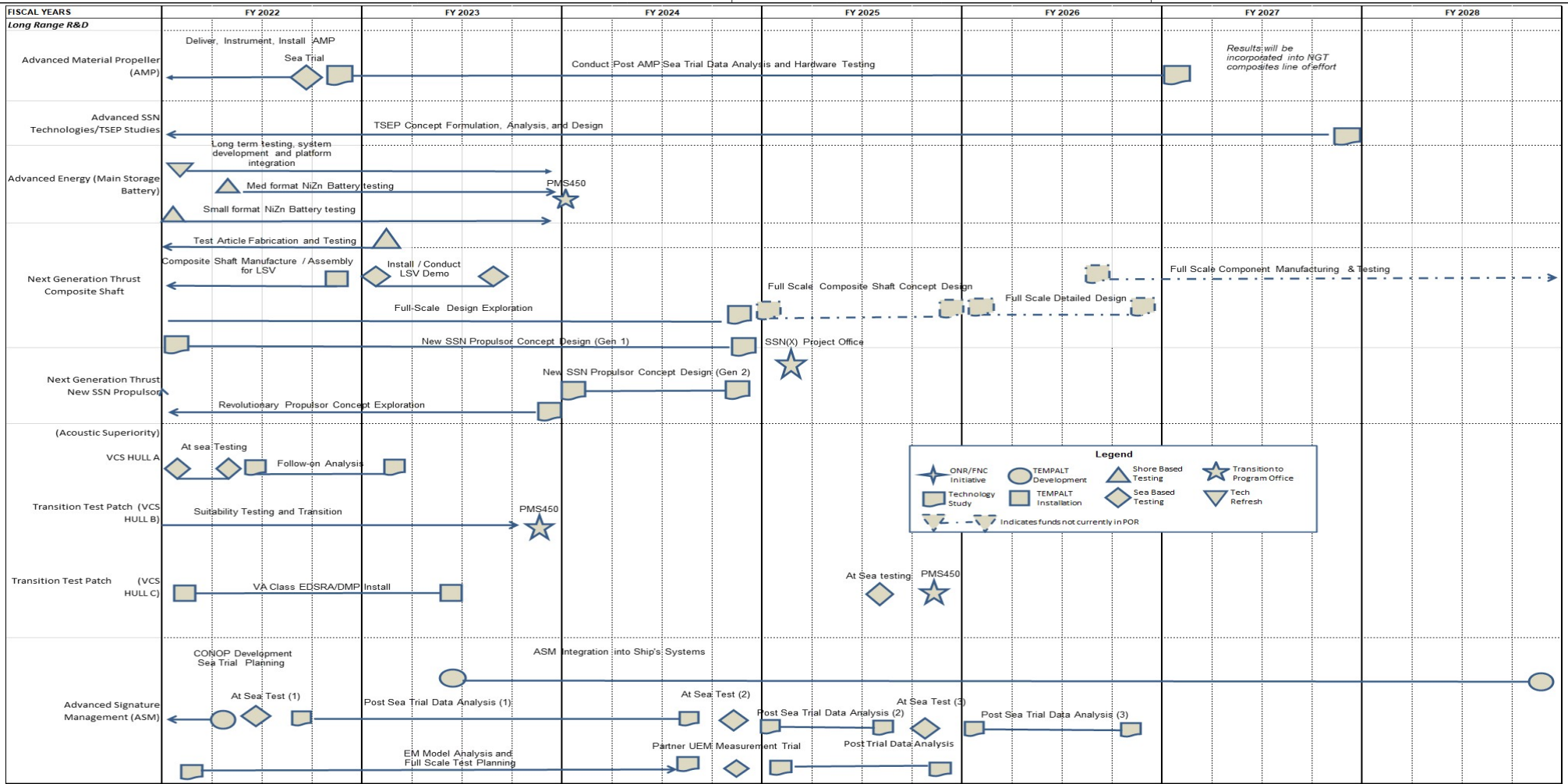
Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023					
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development						Project (Number/Name) 2033 / Adv Submarine Systems Development					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total					
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract		
Remarks																	
Various/VAR is used to group multiple activities with small funding levels.																	
GDIT contract supports engineering services/technical support of LSV, ISMS, and associated infrastructure at Acoustic Research Detachment Bayview Idaho.																	
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals			602.235	28.859		36.607		28.055		-		28.055	Continuing	Continuing	N/A		
Remarks																	

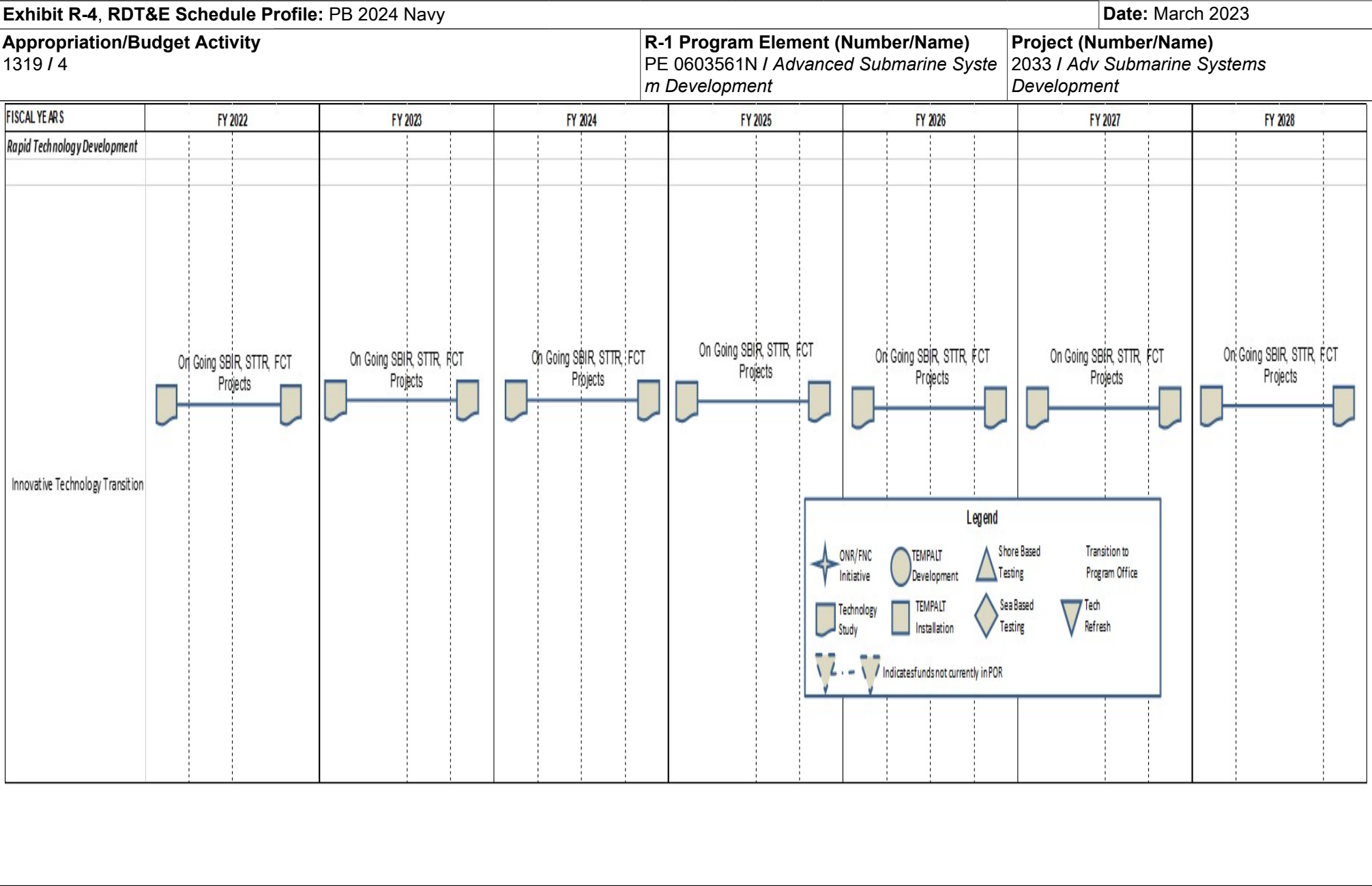
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development	Project (Number/Name) 2033 / Adv Submarine Systems Development
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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development	Project (Number/Name) 2033 / Adv Submarine Systems Development
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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603561N / <i>Advanced Submarine System Development</i>	Project (Number/Name) 2033 / <i>Adv Submarine Systems Development</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2033				
Strategic Capability Infrastructure: ISMS/LSV /HGMS- ISMS ESP Barge Rebuild	1	2022	3	2023
Strategic Capability Infrastructure: ISMS /LSV/HGMS - LSV Sustainment, Maintenance, Crew Qualification and Operations	1	2022	4	2028
Strategic Capability Infrastructure: ISMS /LSV/HGMS - LSV Battery and Buswork Replacement	2	2022	4	2022
Strategic Capability Infrastructure: ISMS /LSV/HGMS - LSV Battery Replacement (4 year replacement cycle)	2	2026	3	2026
Strategic Capability Infrastructure: ISMS/LSV/HGMS - ISMS Range Sustainment Operations	1	2022	4	2028
Strategic Capability Infrastructure: ISMS/LSV/HGMS - HGMS Critical Component Mid-Life Major Maintenance	1	2024	4	2027
Strategic Capability Infrastructure: ISMS/LSV/HGMS - HGMS Sustainment	1	2022	4	2028
Strategic Capability Infrastructure: LSV2 Test Schedule - COLUMBIA Propulsor Trials	1	2022	2	2022
Strategic Capability Infrastructure: LSV2 Test Schedule - Composite Shaft Demonstration	1	2023	3	2023
Strategic Capability Infrastructure: LSV2 Test Schedule - VA Flow Noise Test	1	2024	2	2024
Strategic Capability Infrastructure: LSV Test Schedule - ONR M2P2 HMMR Test	3	2023	4	2023
Strategic Capability Infrastructure: LSV2 Test Schedule - SSN(X) Gen 1 Hardware Test NGT	1	2024	3	2024
Strategic Capability Infrastructure: LSV2 Test Schedule - SSN(X) VA Tailcone Trial	3	2024	4	2024
Strategic Capability Infrastructure: LSV2 Test Schedule - ONR M2P2 Test	2	2026	4	2026
Strategic Capability Infrastructure: LSV2 Recapitalization - LSV2 Steering and Diving New System Install Replacement	2	2022	3	2022

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603561N / *Advanced Submarine System Development*

Project (Number/Name)

2033 / *Adv Submarine Systems Development*

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Strategic Capability Infrastructure: LSV2 Recapitalization - Electric Drive Modules First Article Builds and Test	1	2022	4	2023
Strategic Capability Infrastructure: LSV2 Recapitalization - Electric Drive Full System Build, Install, Testing	2	2023	4	2024
Strategic Capability Infrastructure: LSV2 Recapitalization - Electronic Drive Control Electronics (EDCE) Test bed Update and System Sustainment Planning	1	2022	4	2023
Strategic Capability Infrastructure: STAFAC Recapitalization - Prototyping	1	2022	2	2022
Strategic Capability Infrastructure: STAFAC Recapitalization - Critical System Design	1	2022	3	2022
Strategic Capability Infrastructure: STAFAC Recapitalization - Procurement Specifications	1	2022	1	2023
Strategic Capability Infrastructure: STAFAC Recapitalization - Critical Design Review	4	2022	4	2022
Strategic Capability Infrastructure: STAFAC Recapitalization - Component Lab Test and Integration	3	2023	3	2024
Strategic Capability Infrastructure: STAFAC Recapitalization - Systems Test and Integration	1	2025	1	2026
Strategic Capability Infrastructure: STAFAC Recapitalization - Installation	1	2026	3	2026
Strategic Capability Infrastructure: STAFAC Recapitalization - Validation	2	2026	4	2026
Strategic Capability Infrastructure: STAFAC Recapitalization - IOC	1	2027	1	2027
Strategic Capability Infrastructure: STAFAC Recapitalization - FOC	3	2027	3	2027
Long Range R&D: Advanced Material Propeller (AMP) - Deliver instrument and install AMP propeller	1	2022	3	2022
Long Range R&D: Advanced Material Propeller (AMP) - At-sea test on partner submarine	3	2022	3	2022
Long Range R&D: Advanced Material Propeller (AMP) - Post-sea trial data analysis and hardware testing	4	2022	1	2027
Long Range R&D: SSN(X) - Advanced SSN Technologies/TSEP Studies - TSEP concept formulation, analysis, and design	1	2022	4	2028

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603561N / Advanced Submarine System Development

Project (Number/Name)

2033 / Adv Submarine Systems Development

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Long Range R&D: Next Generation Thrust (NGT) Composite Shaft -Test Article fabrication and testing	1	2022	1	2023
Long Range R&D: Next Generation Thrust (NGT) Composite Shaft - Manufacture/ Assembly for LSV	1	2022	4	2022
Long Range R&D: Next Generation Thrust (NGT) Composite Shaft -Install/Conduct LSV Demo	1	2023	3	2023
Long Range R&D: Next Generation Thrust (NGT) Composite Shaft - Full Scale Design Exploration	1	2022	4	2024
Long Range R&D: Next Generation Thrust (NGT) Composite Shaft - Full Scale Concept Design	1	2025	4	2025
Long Range R&D: Next Generation Thrust (NGT) Composite Shaft - Full Scale Detailed Design	1	2026	4	2026
Long Range R&D: Next Generation Thrust (NGT) Composite Shaft - Full Scale Component Manufacturing & Testing	3	2026	4	2028
Long Range R&D: Next Generation Thrust New SSN Propulsor - New SSN Propulsor Concept Design (Gen 1)	1	2022	4	2024
Long Range R&D: Next Generation Thrust New SSN Propulsor - New SSN Propulsor Concept Design (Gen 2)	1	2024	4	2024
Long Range R&D: Next Generation Thrust New SSN Propulsor - Revolutionary Propulsor Concept Exploration	1	2022	4	2023
Long Range R&D: Next Generation Thrust New SSN Propulsor - Transition to SSN(X) Project Office	1	2025	1	2025
Long Range R&D: Advanced Hull Treatments (VCS HULL A) - VA Class Sea Based Testing	1	2022	2	2022
Long Range R&D: Advanced Hull Treatments - Follow-on Analysis	2	2022	1	2023
Long Range R&D: Transition Test Patch (VCS HULL B) - VA Class Suitability Testing	1	2022	4	2023
Long Range R&D: Transition Test Patch (VCS HULL C) - VA Class EDSRA/DMP Install	1	2022	3	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development		Project (Number/Name) 2033 / Adv Submarine Systems Development	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
Long Range R&D: Transition Test Patch (VCS HULL C) - VA Class Sea Based Testing		3	2025	3	2025
Long Range R&D: Transition Test Patch (VCS HULL C) - Transition to VA Class		4	2025	4	2025
Long Range R&D: Advanced Signature Management - ASM Integration into Ship Systems		2	2023	4	2028
Long Range R&D: Advanced Signature Management - CONOP Dev and Sea Trial Planning for Demo		1	2022	2	2022
Long Range R&D: Advanced Signature Management - At Sea Test (1)		2	2022	2	2022
Long Range R&D: Advanced Signature Management - Post Sea Trials Data Analysis (1)		3	2022	3	2024
Long Range R&D: Advanced Signature Management - At Sea Test (2)		4	2024	4	2024
Long Range R&D: Advanced Signature Management - Post Sea Trials Data Analysis (2)		1	2025	3	2025
Long Range R&D: Advanced Signature Management - At Sea Test (3)		4	2025	4	2025
Long Range R&D: Advanced Signature Management - Post Sea Trials Data Analysis (3)		1	2026	4	2026
Long Range R&D: Advanced Signature Management - EM Model Testing/Analysis and Full Scale Test Planning		1	2022	3	2024
Long Range R&D: Advanced Signature Management - Partner UEM Measurement Trial		4	2024	4	2024
Long Range R&D: Advanced Signature Management - Post Measurement Trial Data Analysis		1	2025	4	2025
Long Range R&D: Advance Energy (Main Storage Battery) - Small Format Testing		1	2022	4	2023
Long Range R&D: Advance Energy (Main Storage Battery) - Medium Format Testing		2	2022	4	2023
Long Range R&D: Advance Energy (Main Storage Battery) - Large Format Testing		4	2022	4	2023
Long Range R&D: Advance Energy (Main Storage Battery) - Long Term Testing System Development & Platform Integration Studies		1	2022	4	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development		Project (Number/Name) 2033 / Adv Submarine Systems Development	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
Rapid Technology Development: Innovative Technology Transition - Conduct assessment of technology initiatives, SBIR transition work, STTR, Foreign Comparative Tests		1	2022	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603561N / <i>Advanced Submarine System Development</i>				Project (Number/Name) 2096 / <i>Payload Delivery Development</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2096: <i>Payload Delivery Development</i>	43.632	2.506	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	46.138
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Decrease in funds from FY22 to FY23 is due to a change in approach for the Program.

Payload Delivery Development is a program used for the integration of deployable and retrievable payloads with submarines. RDT&EN funding will be used to develop a prototype payload launch and recovery system utilized with submarine large ocean interfaces to accommodate payloads and offboard systems. The project enables launch and recovery of these systems from submarines. This will provide the Submarine Force with the capability to launch and recover payloads and offboard systems of various configurations in support of critical Undersea Warfare (USW) missions, providing battle space awareness and extending war-fighting reach in support of Subsea and Seabed Warfare (SSW) mission objectives. This capability has been identified as a key enabler for the following critical USW mission areas: Intelligence, Surveillance, and Reconnaissance (ISR), Anti-Submarine Warfare (ASW), Anti-Surface Warfare (ASUW), Naval Special Warfare (NSW), Mine Warfare, Subsea and Seabed Warfare (SSW), Counter- Autonomous Underwater Vehicle (AUV) Warfare, Electromagnetic Maneuver Warfare (EMMW), Deception, and Non-Lethal Sea Control. In addition to technology development, the program will support engineering and integration of new and existing technologies to enable rapid prototyping and fielding of future payload capabilities for VIRGINIA Class (VCS) Payload Modules (Block V and VI) and will be in coordination with the Tactical Submarine Evolution Plan (TSEP) objectives for VCS Block VII and/or SSN(x). The prototype system capability will also provide the Fleet [i.e., Commander, Naval Submarine Forces (COMSUBFOR), Unmanned Undersea Vehicle Squadron One (UUVRON ONE), etc.] with the ability to conduct Fleet funded experimentation with unmanned payloads, enabling an agile environment through at-sea demonstrations, which will provide Fleet and acquisition stakeholders with relevant payload employment data to inform Concepts of Operations (CONOPs) and fielding decisions for future systems.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Payload Handling System (PHS)	2.506	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Payload Delivery Development includes the development of "middle-ware" handling systems used to deploy and retrieve undersea vehicles, payloads, and offboard systems from submarines. Funding will be used to design and develop a build to print Technical Data Package (TDP) for a system to facilitate the raising, lowering and articulation of payloads into and out of submarine large ocean interfaces (e.g. missile tubes; torpedo tubes) to increase future war fighting capabilities. Additionally, these efforts include the transfer of technology and final design packages to industry for future multi-unit procurement and application on future VIRGINIA Class and other future submarines.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603561N / <i>Advanced Submarine System Development</i>		Project (Number/Name) 2096 / <i>Payload Delivery Development</i>		
<u>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</u>						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Long lead-time material purchases began in FY20 and continued into FY21. This material will be dispositioned by the end of FY22.</p> <p>Planned FY22 efforts include completion of a build to print Technical Data Package (TDP) that can be transferred to industry for manufacturing to support future integration into VIRGINIA Class submarines.</p> <p><i>FY 2023 Plans:</i> N/A</p> <p><i>FY 2024 Base Plans:</i> N/A</p> <p><i>FY 2024 OCO Plans:</i> N/A</p>						
Accomplishments/Planned Programs Subtotals		2.506	0.000	0.000	0.000	0.000
<u>C. Other Program Funding Summary (\$ in Millions)</u> N/A						
<u>Remarks</u>						
<u>D. Acquisition Strategy</u> Project will transition to multiple unmanned vehicle programs to support VIRGINIA Class integration.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603561N / <i>Advanced Submarine System Development</i>	Project (Number/Name) 2096 / <i>Payload Delivery Development</i>
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development (1)	WR	NUWC NPT : Newport, RI	6.730	0.275	Oct 2021	0.000		0.000		-		0.000	0.000	7.005	-
Product Development	WR	NSWC PD : Philadelphia, PA	17.345	0.850	Oct 2021	0.000		0.000		-		0.000	0.000	18.195	-
Product Development (1)	WR	NUWC KPT : Keyport, WA	8.792	0.600	Oct 2021	0.000		0.000		-		0.000	0.000	9.392	-
Product Development (1)	WR	PSNS : Bremerton, WA	4.379	0.471	Oct 2021	0.000		0.000		-		0.000	0.000	4.850	-
Product Development	WR	NSWC CD : West Bethesda, MD	3.079	0.000		0.000		0.000		-		0.000	0.000	3.079	-
Product Development	WR	NRL : Washington, DC	0.255	0.000		0.000		0.000		-		0.000	0.000	0.255	-
Product Development	FFRDC	ARL/PSU : Arlington, VA	0.285	0.000		0.000		0.000		-		0.000	0.000	0.285	-
Product Development	WR	NSWC DD : Dahlgren, VA	0.026	0.000		0.000		0.000		-		0.000	0.000	0.026	-
Product Development	C/CPFF	DIUx : Mountain View, CA	0.050	0.000		0.000		0.000		-		0.000	0.000	0.050	-
Product Development	WR	PNSY : Portsmouth, NH	0.597	0.000		0.000		0.000		-		0.000	0.000	0.597	-
Subtotal			41.538	2.196		0.000		0.000		-		0.000	0.000	43.734	N/A

Remarks

(1) Decrease in funds from FY22 to FY23 is due to a change in approach for the Program. The change is due to project cancellation.

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Allot	NAVSEA HQ : Washington DC	0.229	0.050	Oct 2021	0.000		0.000		-		0.000	0.000	0.279	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development						Project (Number/Name) 2096 / Payload Delivery Development			
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Management Services	C/CPAF	NTT Data : McLean, VA	1.865	0.260	Nov 2021	0.000		0.000		-		0.000	0.000	2.125	-
Subtotal			2.094	0.310		0.000		0.000		-		0.000	0.000	2.404	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			43.632	2.506		0.000		0.000		-		0.000	0.000	46.138	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy														Date: March 2023																											
Appropriation/Budget Activity 1319 / 4														R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development								Project (Number/Name) 2096 / Payload Delivery Development																			
Payload Handling System (PHS)														FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
														1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
PHS Milestones														<div></div>																											
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VPM Integration														<div></div>																											
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Snakehead LDUUV Plan														<div></div>																											
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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development	Project (Number/Name) 2096 / Payload Delivery Development	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Payload Handling System (PHS)				
PHS Milestones: Detailed Design	1	2022	1	2022
PHS Milestones: Drawing Development (DWG)	1	2022	2	2022
PHS Milestones: VIRGINIA Class Build to Print TDP Ready	1	2022	3	2022
PHS Milestones: Final disposition of material	3	2022	4	2022
VPM Integration: Group 1 Execution Plan Undersea Dominance Payload Integration (UDPI)	1	2022	4	2022
VPM Integration: Block VI Tech Baseline Lockdown	2	2022	2	2022
Snakehead LDUUV Plan: Award	2	2022	2	2022
Snakehead LDUUV Plan: Phase 2 Vehicle Design & Fabrication	2	2022	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development				Project (Number/Name) 3391 / SSN/SSGN Survivability Program			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3391: SSN/SSGN Survivability Program	35.264	11.118	10.848	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	57.230
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
In 2013, OPNAV N97 established SSN/SSGN Survivability Program (S3P) as a separate project area within ASSD to assure SSN/SSGN survivability and the ability of submarines to complete their joint warfighting missions even if covert mobility is compromised.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: SSN/SSGN Survivability Program								11.118	10.848	0.000	0.000	0.000
								Articles: - - - - -				
Description: The details of project activities are SECRET or higher. The SSN/SSGN Survivability Program (S3P) provides Director, Undersea Warfare Division (OPNAV N97) with qualitative and quantitative analysis of potential SSN and SSGN submarine vulnerabilities based on technology threats and operational requirements and recommends countermeasure concepts to mitigate these potential vulnerabilities. S3P informs the entire \$10B submarine portfolio with validated analysis which informs risk to submarine survivability and stealth in contested environments. This analysis also informs methods by which stealth can be regained once compromised to execute missions such as weapons employment. S3P conducts technical analysis validated with at-sea testing. The technical analysis is put into an operational context using data from current submarine operations and Fleet war plans. S3P develops technologies and tools to increase the survivability of submarines by recognizing and mitigating sources of acoustic and non-acoustic vulnerabilities that put a submarine at risk when operating in contested waters and the littorals. S3P supports fleet development of Tactics, Techniques, and Procedures (TTPs) that facilitate new or enhance existing warfighting concepts.												
FY 2023 Plans:												
S3P will address gaps in stealth and survivability for the current SSN/SSGN force to include responding to fleet questions on current tactical vulnerabilities and completion of an annual Operational Survivability Assessment. Work includes:												
- Conducting analytical and technical work on Tactical Submarine Evolution Plan and future SSN/SSGN survivability design basis.												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy								Date: March 2023				
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603561N / <i>Advanced Submarine System Development</i>				Project (Number/Name) 3391 / <i>SSN/SSGN Survivability Program</i>				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Conducting emerging threat, acoustic, and non-acoustic vulnerability assessment projects including sea tests in stealth requirements and countermeasure concepts.</p> <p>- Collecting and analyzing current submarine operational data to determine and mitigate vulnerabilities driven by operational profiles</p> <p>- Conduct at-sea tests to evaluate Countermeasures development concepts.</p> <p>- Details may be provided in a classified setting.</p> <p><i>FY 2024 Base Plans:</i> In FY 2024, S3P funding is shifting from PE 0603561N LI 3391 to PE 0101224N LI 3391 as part of a zero-sum realignment to consolidate management and contracting.</p> <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> In FY 2024, S3P funding is shifting from PE 0603561N LI 3391 to PE 0101224N LI 3391 as part of a zero-sum realignment to consolidate management and contracting. PE 0603561N PU 3391 will be reduced to zero and 0101224N PU 3391 will be increased the same amount that PE 0603561N PU 3391 was reduced.</p>												
								Accomplishments/Planned Programs Subtotals				
C. Other Program Funding Summary (\$ in Millions)												
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>	
• RDTEN/0101224N: SSBN Security Technology	44.212	50.761	62.694	-	62.694	63.824	65.572	67.582	69.160	Continuing	Continuing	
Remarks SSBN Security Technology Program is integrated with S3P to ensure technical lines of effort executed by one program are not duplicated by the other												
D. Acquisition Strategy S3P is a non-acquisition activity that investigates, prioritizes, and validates SSN/SSGN survivability issues for peacetime and all phases of war. S3P also proposes and directs development and validation of countermeasure concepts. S3P works to ensure alignment between OPNAV, NAVSEA, ONI, and the Fleet on survivability issues. S3P develops recommendations for stealth requirements to OPNAV N97 and provides technical basis for Tactics, Techniques, and Procedures developed by the Undersea Warfighting Development Command (UWDC). S3P operates under OPNAV N97 and Fleet Flag panel (Operations Review Group) oversight. S3P												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603561N / <i>Advanced Submarine System Development</i>	Project (Number/Name) 3391 / <i>SSN/SSGN Survivability Program</i>

products and metrics are evaluated by the Submarine Operations Group and Operations Review Group. S3P also recommends technical requirements for all matters of submarine survivability to OPNAV N97.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development					Project (Number/Name) 3391 / SSN/SSGN Survivability Program				
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	MIPR	CNA : Alexandria, VA	1.910	1.036	Jan 2022	0.900	Jan 2023	0.000	Jan 2024	-		0.000	0.000	3.846	-
Product Development	SS/CPFF	MIT-LL : Cambridge, MA	2.470	1.375	Oct 2021	1.100	Oct 2022	0.000	Oct 2023	-		0.000	0.000	4.945	-
Product Development	SS/CPFF	JHU/APL : Laurel, MD	7.846	1.037	Oct 2021	0.400	Oct 2022	0.000	Oct 2023	-		0.000	0.000	9.283	-
Product Development	SS/CPFF	UT/ARL : Austin, TX	1.867	0.645	Oct 2021	0.600	Oct 2022	0.000	Oct 2023	-		0.000	0.000	3.112	-
Product Development	WR	NUWC : Newport, RI	5.165	1.015	Oct 2021	1.000	Oct 2023	0.000	Oct 2023	-		0.000	0.000	7.180	-
Product Development	MIPR	NRL : Washington, DC	0.951	0.000		0.750	Dec 2022	0.000	Oct 2023	-		0.000	0.000	1.701	-
Product Development	C/BA	NSMA : Not Specified	2.602	0.650	Mar 2022	0.600	Dec 2022	0.000	Oct 2023	-		0.000	0.000	3.852	-
Product Development	SS/CPFF	Sonalysts : Groton, CT	2.530	1.103	Oct 2021	1.430	Oct 2022	0.000	Oct 2023	-		0.000	0.000	5.063	-
Product Development	WR	NSWCPD : Philadelphia, PA	0.205	0.097	Oct 2021	0.164	Oct 2022	0.000	Oct 2023	-		0.000	0.000	0.466	-
Product Development	SS/CPFF	Lockheed : Not Specified	0.050	0.125	Mar 2022	0.125	Oct 2022	0.000	Oct 2023	-		0.000	0.000	0.300	-
Subtotal			25.596	7.083		7.069		0.000		-		0.000	0.000	39.748	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel and Corporate	WR	NAVSEA HQ : Not Specified	0.761	0.020	Oct 2021	0.050	Oct 2022	0.000	Oct 2023	-		0.000	0.000	0.831	-
Subtotal			0.761	0.020		0.050		0.000		-		0.000	0.000	0.831	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development				Project (Number/Name) 3391 / SSN/SSGN Survivability Program					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NSWC : Carderock, MD	7.557	0.847	Apr 2022	1.416	Oct 2022	0.000	Oct 2023	-		0.000	0.000	9.820	-
Developmental Test & Evaluation (DT&E)	SS/CPFF	JHU/APL : Laural, MD	0.000	3.168	Oct 2021	1.953	Oct 2022	0.000	Oct 2023	-		0.000	0.000	5.121	-
Subtotal			7.557	4.015		3.369		0.000		-		0.000	0.000	14.941	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	SS/CPFF	NSMA : Not Specified	1.350	0.000	Dec 2021	0.360	Dec 2022	0.000	Dec 2023	-		0.000	0.000	1.710	-
Subtotal			1.350	0.000		0.360		0.000		-		0.000	0.000	1.710	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			35.264	11.118		10.848		0.000		-		0.000	0.000	57.230	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603561N / <i>Advanced Submarine System Development</i>		Project (Number/Name) 3391 / <i>SSN/SSGN Survivability Program</i>	

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Assessments																												
Annual Survivability Assessment																												
Acoustic Assessment																												
Non-Acoustic Assessment																												
Vulnerability Validation																												
Vulnerability SEA Test Validation Program (1-2 per year)																												
Countermeasures																												
Countermeasure Validation (2-3 per year)																												
Advanced Submarine Signature Management/Countermeasures																												
Sea Test Validation Program (1 per year)																												
Signature Vulnerability Assessment (1 per year)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development	Project (Number/Name) 3391 / SSN/SSGN Survivability Program

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Assessments				
Annual Survivability Assessment	1	2022	4	2023
Acoustic Assessment	1	2022	4	2023
Non-Acoustic Assessment	1	2022	4	2023
Vulnerability Validation				
Vulnerability SEA Test Validation Program (1-2 per year)	1	2022	4	2023
Countermeasures				
Countermeasure Validation (2-3 per year)	1	2022	4	2023
Advanced Submarine Signature Management/Countermeasures				
Sea Test Validation Program (1 per year)	1	2022	4	2023
Signature Vulnerability Assessment (1 per year)	1	2022	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603561N / <i>Advanced Submarine System Development</i>				Project (Number/Name) 9999 / <i>Congressional Adds</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	0.000	0.000	5.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification
 This task will support the development and qualification of NiZn cells and main storage battery design options to evaluate feasibility for insertion into the VIRGINIA Class Block VII technical baseline.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023
<i>Congressional Add:</i> Nickle-zinc battery deployment for Virginia class	0.000	5.000
<i>FY 2022 Accomplishments:</i> N/A		
<i>FY 2023 Plans:</i> Leverage prior Congressional Add (FY20 Small Business Tech Insertion) and SUB 073/ONR ManTech investment to continue NiZn battery cell performance testing, long string testing, battery management system design development, and other qualification tests as needed. Coordinate transition of NiZn Main Storage Battery research and development from Program Office (SUB 073) to VA Class Program Office (PMS 450) in support of VA Block VII design space exploration. Execute engineering study to evaluate the use of nickel zinc batteries in Large Scale Vehicle (LSV-2) to support increased support system/data acquisition system power demands and extend platform mission profile.		
Congressional Adds Subtotals	0.000	5.000

C. Other Program Funding Summary (\$ in Millions)
 N/A

Remarks

D. Acquisition Strategy
 N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development						Project (Number/Name) 9999 / Congressional Additions			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	SS/CPFF	NNS/HII : Newport News, VA	0.000	0.000		0.500	Mar 2023	0.000		-		0.000	0.000	0.500	-
Product Development	SS/CPFF	GD/EB : Groton, CT	0.000	0.000		0.300	Mar 2023	0.000		-		0.000	0.000	0.300	-
Product Development	WR	NSWC Crane : Crane, IN	0.000	0.000		4.200	Mar 2023	0.000		-		0.000	0.000	4.200	-
Subtotal			0.000	0.000		5.000		0.000		-		0.000	0.000	5.000	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		5.000		0.000		-		0.000	0.000	5.000	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																								Date: March 2023																			
Appropriation/Budget Activity 1319 / 4												R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development								Project (Number/Name) 9999 / Congressional Additions																							
Proj 9999												FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028							
												1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
NiZn Battery Deployment for VA Class																Engineering Study																											
																				Cell Performance Testing																							
																				Long String Testing																							
																				Battery Management System Testing																							
																				Qualification Testing																							
2024PB - 0603561N - 9999																																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603561N / Advanced Submarine System Development	Project (Number/Name) 9999 / Congressional Adds	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
NiZn Battery Deployment for VA Class: Engineering Study	2	2023	4	2023
NiZn Battery Deployment for VA Class: Cell Performance Testing	2	2023	4	2024
NiZn Battery Deployment for VA Class: Long String Testing	3	2023	4	2024
NiZn Battery Deployment for VA Class: Battery Management System Testing	4	2023	4	2024
NiZn Battery Deployment for VA Class: Qualification Testing	1	2024	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>					R-1 Program Element (Number/Name) PE 0603562N / <i>Submarine Tactical Warfare Sys</i>							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	126.020	13.832	10.808	15.119	-	15.119	15.171	14.356	12.748	12.839	Continuing	Continuing
0770: <i>Adv Sub Supp Equip Prog</i>	38.756	4.571	3.726	7.791	-	7.791	7.728	6.773	5.040	5.047	Continuing	Continuing
1739: <i>Submarine Arctic W/F Development</i>	87.264	9.261	7.082	7.328	-	7.328	7.443	7.583	7.708	7.792	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element (PE) addresses advanced submarine technology areas in support of the Navy's strategic objective of Assured Access and Combat Credibility. All projects funded in this PE are non-Acquisition Category (ACAT) programs.

PROJECT 0770 - The Advanced Submarine Support Equipment Program (ASSEP) objective is to improve submarine operational effectiveness through the implementation of advanced Research and Development (R&D). In order to provide improved operational effectiveness, efforts are focused on advanced Imaging and Electronic Warfare (EW) support development. A continuing need exists to improve these capabilities in view of the advancements in potential imaging counter-detection, the need to support specialized missions, and the increasingly dense and sophisticated electronic environment caused by the proliferation of complex radar, communications, and navigation equipment of potential adversaries. Ongoing developments include improved antennas, tethered buoy, 360-degree imaging systems, and electro-optic infra-red (EO/IR) vulnerability signature reduction technologies. Beginning in FY 2024, this project supports the development of changes internal to submarine platforms to integrate the Submarine Tethered Expendable Buoy (STEB). This integration will provide a communications path to and from the buoy bringing buoy sensor data into the submarine combat system to improve situational awareness and tactical control while maintaining a covert posture.

PROJECT 1739 - The Submarine Arctic Warfare Development Project is aligned to Commander, Undersea Warfighting Development Center (UWDC), Detachment Arctic Submarine Laboratory (ASL). This Project provides the U.S. Navy Submarine Force (SUBFOR) a cadre of trained Arctic Operation Specialists (AOS) and an inventory of unique Arctic sensors that are installed to optimize submarine safety during under-ice operations. AOS personnel assigned from ASL embark on submarines that deploy to the Arctic, cold water and iceberg regions, and marginal ice zones (MIZ) in northern latitudes of the Atlantic and Pacific Oceans, and are advisers to the Commanding Officer. ASL is a shore facility at Naval Base Point Loma with the infrastructure capable of supporting personnel and equipment to conduct the submarine Arctic Warfare Development mission. Improvements and life-cycle expenditures to the facility and warehousing are made as necessary to support the mission.

The Submarine Arctic Warfare Development Project, via ASL, responds to the increased threat of naval activity in the Arctic regions while continuously supporting the Navy's strategic objective of Assured Access and Combat Credibility. ASL provides a unique capability that enables the SUBFOR to satisfy the requirements laid out in the Arctic Maritime Homeland Defense Initial Capabilities Document (ICD). ASL and SUBFOR demonstrate existing Arctic Warfare capabilities and operational and tactical proficiency while developing advanced submarine technology in unique cold water environments, in under-ice conditions, and in ice-covered shallow water regions during a biennial Ice Exercise (ICEX). ICEX places an emphasis on submarine operability and mission capability in the world's harshest maritime environment. Efforts include assessment of combat system effectiveness, weapons testing, use of High Frequency (HF) sonars in Arctic regions, testing of ice-capable submarine structures, and development of class-specific Arctic operational guidelines. Tactical Development (TACDEV) ICEXs are conducted biennially and require

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0603562N / Submarine Tactical Warfare Sys				
up front comprehensive planning and work-up training, as well as post exercise analysis and reporting. ICEXs provide the framework for various submarine test and evaluation in Arctic regions and at periodic Ice Camps. This program represents DoD's only drifting ice station capability. Emphasis during ICEX is placed on the areas of sonar operability, tactical surveillance, weapon utility, and other submarine support missions. These efforts include the assessment of combat system effectiveness, development of Arctic specific improvements for existing sonar and weapons, development of class-specific Arctic operational guidelines, and testing of ice-capable submarine support structures.						
A torpedo firing ICEX occurs every four (4) years (FY 2022, FY 2026, etc.) in order to meet minimum Fleet requirements of exercise torpedo (EXTORP) firings in the Arctic. A Torpedo Exercise (TORPEX) requires a significantly higher level of logistics, personnel, and infrastructure to account for the recovery and transportation efforts of the EXTORPs. The ICEX Program also includes Arctic Exercise (ARCEX), a biennial exercise that rotates with the biennial ICEX drifting ice camps, that includes Arctic operations to support ice camp equipment evaluation, systems development, extreme cold weather training, and perform drifting sea ice analysis required to improve drifting sea ice camp Arctic operations.						
B. Program Change Summary (\$ in Millions)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget		14.059	10.917	12.706	-	12.706
Current President's Budget		13.832	10.808	15.119	-	15.119
Total Adjustments		-0.227	-0.109	2.413	-	2.413
• Congressional General Reductions		-	-0.109			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	-			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-0.227	0.000			
• Program Adjustments		0.000	0.000	2.339	-	2.339
• Rate/Misc Adjustments		0.000	0.000	0.074	-	0.074
Change Summary Explanation						
FUNDING CHANGES SINCE THE PREVIOUS PRESIDENT'S BUDGET AT THE OVERALL PE LEVEL:						
- FY 2022 net decrease of \$-0.227M reflects the Small Business Innovative Research (SBIR) transfer.						
- FY 2023 net decrease of \$-0.109M reflects a reduction applied to Federally Funded Research and Development Centers (FFRDCs)						
- FY 2024 net increase of \$+2.413M reflects the inclusion of funding for transitioning the Submarine Tethered Expendable Buoy (STEB) to a Program of Record (+\$2.339M) the incorporation of miscellaneous program/rate adjustments (+\$0.074M).						
PROJECT 0770:						
- FY 2023 TO FY 2024 BUDGET REQUEST INCREASE: FY 2023 (\$3.726M) to FY 2024 (\$7.791M) increase (\$+4.065M) is due to the transition of STEB to a Program of Record (+\$2.339M), 2) and other miscellaneous program/rate adjustments. In addition to the funding required to transition STEB to a program of						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603562N / Submarine Tactical Warfare Sys	
<p>record, the increase in FY 2024 is also required to plan and conduct at-sea testing of new EW sensors and analyze results before transitioning to the Program Executive Office, Undersea Warfare Systems (PEO UWS).</p> <p>- SCHEDULE CHANGES SINCE PREVIOUS PRESIDENT'S BUDGET: Tethered Imaging/Electronic Warfare Buoy at-sea test event has shifted from 4Q23 to 1Q24 due to supply chain issues procuring long-lead buoy materials.</p> <p>PROJECT 1739:</p> <p>- FY 2023 TO FY 2024 BUDGET REQUEST INCREASE: FY 2023 (\$7.082M) to FY 2024 (\$7.328M) increase (\$+0.246M) is in line with the inflation expected with the RDT&EN appropriation.</p> <p>- SCHEDULE CHANGES SINCE FY23 BUDGET: Arctic Exercise (ARCEX) events were added starting in FY 2023. The duration of the ice camp events in FY 2022/2024/2026/2028 was corrected from 1Q-4Q to 1Q-3Q in ICEX years to more accurately reflect the duration of the ice camps.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603562N / Submarine Tactical Warfare Sys				Project (Number/Name) 0770 / Adv Sub Supp Equip Prog			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0770: Adv Sub Supp Equip Prog	38.756	4.571	3.726	7.791	-	7.791	7.728	6.773	5.040	5.047	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

A continuing need exists to improve Imaging and Electronic Warfare (EW) support capabilities in view of the advancements in potential imaging counter-detection and the increasingly dense electromagnetic environment caused by the proliferation of complex radar, communications, and navigation equipment of potential adversaries. Improvements are necessary for submarine Imaging and EW to be operationally effective in the following mission areas: Joint Littoral Warfare, Joint Surveillance, Space and Electronic Warfare, Intelligence Collection, Maritime Protection, and Joint Strike. This project, previously divided into two project categories, Advanced Imaging Project Development and Advanced Electronic Warfare Support Project Development, is now operating under a single category titled Imaging and Electronic Warfare (EW) Support Capabilities, going forward the project will concurrently consider both domains as improved mast systems are designed. The evaluation of state-of-the-art technology to implement periscope/mast improvements via EW electromagnetic and electro-optic sensors results in improved capability. Engineering Development Models (EDMs) are developed, evaluated, and validated in the lab and through at-sea testing.

This project is a non-Acquisition Category (ACAT) program. The test articles identified consist of critical components that will be fully developed during Engineering Manufacturing and Development phase into EDMs. Software-based capabilities in Imaging and/or EW domains that will process inputs from improved masts may be integrated and tested within this project.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Imaging and Electronic Warfare (EW) Support Capabilities	4.571	3.726	5.452	0.000	5.452
Articles:	-	-	-	-	-
FY 2023 Plans: - Continue development of the advanced Imaging and EW sensor configuration for submarine periscopes. - Conduct in-lab and lake testing of new sensors under consideration to verify performance meets operational needs. - Continue sensor stack prototype and conduct testing to validate approach before transitioning to Program Executive Office, Undersea Warfare Systems (PEO UWS) production program for integration into submarine masts. - Complete RADAR Vulnerability Assessment Tool (RVAT), Detection Finding (DF), and Low Probability of Intercept (LPI) development/integration and transition to PEO UWS production program.					
FY 2024 Base Plans: - Continue development of the advanced imaging and EW sensor configuration for submarine periscopes.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603562N / Submarine Tactical Warfare Sys		Project (Number/Name) 0770 / Adv Sub Supp Equip Prog		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div>- Expand imaging algorithms to other imaging sensors in new masts such as Short Wave Infra-Red (SWIR).</div> <div>- Develop, test, and integrate new antenna configurations to support improved radar direction finding (Multiband Omni + Direction Finding Array (MODA) Antenna).</div> <div>- Develop, test, and integrate smaller form-factor antennas to expand periscope sensing and direction finding frequency range.</div> <div>- Conduct at-sea testing of new sensors under consideration to verify performance meets operational needs.</div> <div>- Continue sensor stack prototyping to support testing in at-sea environments to validate approach before transitioning to PEO UWS for integration into submarine masts.</div> <div>- Conduct at-sea testing of Imaging and EW tethered buoy to verify performance meets operational needs.</div> <div>FY 2024 OCO Plans: N/A</div> <div>FY 2023 to FY 2024 Increase/Decrease Statement: - FY 2023 (\$3.726M) to FY 2024 (\$5.452M) increase is required to plan and conduct at-sea testing of new sensors and analyze results before transitioning to PEO UWS.</div>						
<div>Title: Submarine Tethered Expendable Buoy (STEB) Transition</div> <div>Articles:</div> <div>Description: This effort supports the development of changes internal to submarine platforms to integrate the Submarine Tethered Expendable Buoy (STEB). This integration will provide a communications path to and from the buoy bringing buoy sensor data into the submarine combat system to improve situational awareness and tactical control while maintaining a covert posture.</div> <div>FY 2023 Plans: N/A</div> <div>FY 2024 Base Plans: - Initiate design and development of physical connections from the Imaging and Electronic Warfare (EW) tethered buoy launcher to the Submarine Warfare Federated Tactical System (SWFTS).</div> <div>- Initiate design and development of Imaging and EW tethered buoy signal processing and control technologies.</div> <div>FY 2024 OCO Plans: N/A</div> <div>FY 2023 to FY 2024 Increase/Decrease Statement:</div>		0.000 -	0.000 -	2.339 -	0.000 -	2.339 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy								Date: March 2023			
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603562N / <i>Submarine Tactical Warfare Sys</i>				Project (Number/Name) 0770 / <i>Adv Sub Supp Equip Prog</i>			

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
FY 2024 reflects the initiation of the STEB Transition to a Program of Record effort.					
Accomplishments/Planned Programs Subtotals	4.571	3.726	7.791	0.000	7.791

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTEN/0603561N/0223: <i>Combat System Improvement (ADV)</i>	53.922	57.691	60.360	-	60.360	61.336	62.917	62.880	62.198	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
<p>- This project is a non-Acquisition Category (ACAT) program.</p> <p>- This project optimizes technology insertion using a build-test-build approach to support EW and Imaging operational needs. Project efforts develop submarine unique improvements to mast, periscope, and EW electromagnetic spectrum and electro-optic sensors based on emerging technologies that are available from DoD Exploratory Development Programs, industry Independent Research and Development, and other sources. Engineering Development Models (EDMs) will be developed to provide a realistic method of evaluating the improvements, including deployment on submarines for testing.</p>											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603562N / Submarine Tactical Warfare Sys				Project (Number/Name) 0770 / Adv Sub Supp Equip Prog					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Imaging and EW Support Capability Development	C/CPFF	JHU/APL : MD	2.478	0.000		0.000		0.000		-		0.000	0.000	2.478	-
Imaging and EW Support Capability Development	C/CPFF	Lockheed Martin : VA	0.000	1.773	Nov 2021	0.744	Dec 2022	1.925	Dec 2023	-		1.925	Continuing	Continuing	Continuing
Imaging and EW Support Capability Development	MIPR	MIT/LL : MA	1.554	1.443	Feb 2022	1.135	Dec 2022	1.650	Dec 2023	-		1.650	Continuing	Continuing	Continuing
Imaging and EW Support Capability Development	WR	NUWC : RI	30.758	0.334	Oct 2021	0.443	Nov 2022	2.624	Nov 2023	-		2.624	Continuing	Continuing	Continuing
Imaging and EW Support Capability Development	C/FFP	PSU/ARL : PA	0.975	0.305	Jan 2022	0.764	Dec 2022	0.550	Dec 2023	-		0.550	Continuing	Continuing	Continuing
Imaging and EW Support Capability Development	C/FFP	Toyon Research Corp : CA	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	-
Imaging and EW Support Capability Development	C/FFP	VAR : VAR*	1.398	0.080	Dec 2021	0.075	Dec 2022	0.467	Dec 2023	-		0.467	Continuing	Continuing	Continuing
Subtotal			37.663	3.935		3.161		7.216		-		7.216	Continuing	Continuing	N/A
Remarks															
* Consists of multiple performing activities with funding for each not greater than \$1M per year.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Office Travel	WR	NAVSEA : DC	0.453	0.020	Oct 2021	0.025	Oct 2022	0.025	Oct 2023	-		0.025	Continuing	Continuing	Continuing
Program Management	C/FFP	KMS Solutions* : VA	0.640	0.616	Mar 2022	0.540	Dec 2022	0.550	Dec 2023	-		0.550	Continuing	Continuing	Continuing
Subtotal			1.093	0.636		0.565		0.575		-		0.575	Continuing	Continuing	N/A
Remarks															
* In addition to program office support, KMS Solutions provides technical planning, systems engineering, and test support. KMS Solutions also provides Subject Matter Experts (SMEs) for technical Peer Review Working Groups and Integrated Product Teams (IPTs) in support Electronic Warfare capability development.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023				
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603562N / Submarine Tactical Warfare Sys					Project (Number/Name) 0770 / Adv Sub Supp Equip Prog					
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			38.756	4.571		3.726		7.791		-		7.791	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603562N / Submarine Tactical Warfare
Sys

Project (Number/Name)

0770 / Adv Sub Supp Equip Prog

Advanced Submarine Support Equipment Program

Fiscal Year	2022				2023				2024				2025				2026				2027				2028			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
RADAR Vulnerability Assessment Tool Development	Development				Transition																							
Virginia Class Submarine Direction Finding Improvement Development	Development				Transition																							
Low Probability of Intercept RADAR Improvement Development	Development				Transition																							
Electronic Warfare Low Frequency Antenna	Develop.				Transition																							
Tethered Imaging / Electronic Warfare Buoy	Develop.				Lab Testing				At-Sea Test				Transition															
Submarine Tethered Expendable Buoy (STEB) Internal Connection									Develop Physical Connection & SWFTS Controls								Lab & At-Sea Testing				Transition							
Next Generation Imaging / Electronic Warfare Sensor Concepts	Design/Develop, Prototype, Land/At-Sea Test, EDM, Transition																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603562N / Submarine Tactical Warfare Sys

Project (Number/Name)

0770 / Adv Sub Supp Equip Prog

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Imaging and Electronic Warfare Support Capabilities</i>				
RADAR Vulnerability Assessment Tool - Development	1	2022	1	2023
RADAR Vulnerability Assessment Tool - Transition to PEO UWS Production Program	1	2023	1	2023
Virginia Class Submarine Direction Finding Improvement - Development	1	2022	1	2023
Virginia Class Submarine Direction Finding Improvement - Transition to PEO UWS Production Program	1	2023	1	2023
Low Probability of Intercept RADAR Improvement - Development	1	2022	1	2023
Low Probability of Intercept RADAR Improvement Test - Transition to PEO UWS Production Program	1	2023	1	2023
Electronic Warfare Low Frequency Antenna - Development	1	2022	3	2022
Electronic Warfare Low Frequency Antenna - Transition to PEO UWS Production Program	3	2022	3	2022
Tethered Imaging/Electronic Warfare Buoy - Development	1	2022	2	2024
Tethered Imaging/Electronic Warfare Buoy - Lab Test	3	2022	3	2022
Tethered Imaging/Electronic Warfare Buoy - At-Sea Test	1	2024	1	2024
Tethered Imaging/Electronic Warfare Buoy - Transition to PEO UWS Production Program	2	2024	2	2024
Submarine Tethered Expendable Buoy (STEB) Internal Connection Development	1	2024	4	2025
Submarine Tethered Expendable Buoy (STEB) Internal Connection Testing	1	2026	2	2027
Submarine Tethered Expendable Buoy (STEB) Internal Connection Transition	3	2027	3	2027
Next Generation Imaging/Electronic Warfare Sensor Development	1	2022	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603562N / Submarine Tactical Warfare Sys				Project (Number/Name) 1739 / Submarine Arctic W/F Development			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
1739: Submarine Arctic W/F Development	87.264	9.261	7.082	7.328	-	7.328	7.443	7.583	7.708	7.792	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Submarine Arctic Warfare Development Project is aligned to Commander, Undersea Warfighting Development Center (UWDC), Detachment Arctic Submarine Laboratory (ASL). This Project provides the U.S. Navy Submarine Force (SUBFOR) a cadre of trained Arctic Operation Specialists (AOS) and an inventory of unique Arctic sensors that are installed to optimize submarine safety during under-ice operations. AOS personnel assigned from ASL embark on submarines that deploy to the Arctic, cold water and iceberg regions, and marginal ice zones in northern latitudes of the Atlantic and Pacific Oceans, and are advisers to the Commanding Officer. ASL is a shore facility at Naval Base Point Loma with the infrastructure capable of supporting personnel and equipment to conduct the submarine Arctic Warfare Development mission. Improvements and life-cycle expenditures to the facility and warehousing are made as necessary to support the mission.

The Submarine Arctic Warfare Development Project, via ASL, responds to the increased threat of naval activity in the Arctic regions while continuously supporting the Navy's strategic objective of Assured Access and Combat Credibility. ASL provides a unique capability that enables the submarine force to satisfy the requirements laid out in the Arctic Maritime Homeland Defense Initial Capabilities Document (ICD). ASL and SUBFOR demonstrate existing Arctic Warfare capabilities and operational and tactical proficiency while developing advanced submarine technology in unique cold water environments, in under-ice conditions, and in ice-covered shallow water regions during a biennial Ice Exercise (ICEX). ICEX places an emphasis on submarine operability and mission capability in the world's harshest maritime environment. Efforts include assessment of combat system effectiveness, weapons testing, use of High Frequency (HF) sonars in Arctic regions, testing of ice-capable submarine structures, and development of class-specific Arctic operational guidelines. Tactical Development (TACDEV) ICEXs are conducted biennially and require up front comprehensive planning and work-up training, as well as post exercise analysis and reporting. ICEXs provide the framework for various submarine test and evaluation in Arctic regions and at periodic Ice Camps. This program represents DoD's only drifting ice station capability. Emphasis during ICEX is placed on the areas of sonar operability, tactical surveillance, weapon utility, and other submarine support missions. These efforts include the assessment of combat system effectiveness, development of Arctic specific improvements for existing sonar and weapons, development of class-specific Arctic operational guidelines, and testing of ice-capable submarine support structures. Torpedo ICEXs, occurring every four (4) years (FY 2022, FY 2026, etc.) include a Fleet requirement to conduct exercise torpedo (EXTORP) firings in the Arctic. A Torpedo Exercise (TORPEX) requires a significantly higher level of logistics, personnel, and infrastructure to account for the recovery and transportation efforts of the EXTORPs. The ICEX Program also includes Arctic Exercise (ARCEX), a biennial exercise that rotates with the biennial ICEX drifting ice camps, that includes Arctic operations to support ice camp equipment evaluation, systems development, extreme cold weather training, and perform drifting sea ice analysis required to improve drifting sea ice camp Arctic operations.

All programs funded in this project are non-Acquisition Category (ACAT) programs.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603562N / Submarine Tactical Warfare Sys		Project (Number/Name) 1739 / Submarine Arctic W/F Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Conduct ICEX and Arctic Transit Mission, ICEX Workup and Training, Ice Camps		9.261	7.082	7.328	0.000	7.328
Articles:		-	-	-	-	-
FY 2023 Plans:						
- Conduct Arctic work-up training.						
- Support Arctic deployments, including inter-Fleet transfers, as required by the SUBFOR Commanders.						
- Investigate, research, develop, and deploy new systems for Arctic submarine support.						
- Conduct Arctic Exercise (ARCEX) 2023, a biennial exercise rotating with ICEX, to conduct Arctic operations to support ice camp equipment evaluation, systems development, extreme cold weather training, and perform drifting sea ice analysis required to improve drifting sea ice camp Arctic operations.						
- Support testing and tactical development required to improve submarine Arctic operability and warfighting.						
- Initiate planning, logistics support, procurement, and preparation for ICEX mission 2024 and Ice Camp 2024						
FY 2024 Base Plans:						
- Conduct Arctic work-up training, ICEX mission 2024 with Ice Camp 2024.						
- Conduct ICEX 2024 as a TACDEV event. Operate a submarine tracking range for approximately 14 days, conduct complex and coordinated operations from a drifting ice station. Logistically and operationally support submarine and camp operations from a drifting ice station that will be supported via contracted commercial rotary and fixed-wing aviation services, via US Transportation Command (USTRANSCOM), from temporary infrastructure and services on the North Slope of Alaska.						
- Support Arctic deployments, including inter-Fleet transfers, as required by the SUBFOR Commanders.						
- Investigate, research, test, and deploy new systems for Arctic submarine support.						
- Support testing and tactical development required to improve submarine Arctic operability and warfighting.						
- Conduct Arctic operations to support ice camp equipment evaluation, systems development and perform drifting sea ice analysis required for drifting sea ice camp Arctic operations.						
FY 2024 OCO Plans:						
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement:						
- FY 2023 (\$7.082M) to FY 2024 (\$7.328M) increase (\$+0.246M) is in line with the inflation expected with the RDT&EN appropriation.						
Accomplishments/Planned Programs Subtotals		9.261	7.082	7.328	0.000	7.328

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603562N / Submarine Tactical Warfare Sys	Project (Number/Name) 1739 / Submarine Arctic W/F Development
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy - This project is a non-Acquisition Category (ACAT) program. - Use Naval Undersea Warfare Center (NUWC) to provide technical assistance awarded through NAVSEA Reimbursable Work Order for submarine tracking and TORPEX capability. - Use sole source and competitively awarded contracts through the U.S. Army Corps of Engineers (USACE) Alaska regional office for ICEX Ice Camp logistics, engineering, and operations support. - Use sole source and competitively awarded contracts through the Fleet Logistics Center (FLC) regional contracting office and Defense Logistics Agency (DLA) for equipment procurement and technical services. - Use sole source and competitively awarded contracts through the U.S. Transportation Command (USTRANSCOM) for ICEX aviation support.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603562N / Submarine Tactical Warfare Sys

Project (Number/Name)

1739 / Submarine Arctic W/F Development

Test and Evaluation (\$ in Millions)

				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Test & Evaluation (OT&E)	WR	COMSUBLANT : VA	18.211	3.970	Oct 2021	3.682	Oct 2022	4.257	Oct 2023	-		4.257	Continuing	Continuing	Continuing
Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E)	WR	COMSUBPAC : CA	36.101	0.000		0.000		0.000		-		0.000	0.000	36.101	-
Operational Test & Evaluation (OT&E)	WR	NUWC/Keyport : WA	1.941	0.000		0.225	Nov 2022	0.350	Nov 2023	-		0.350	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	WR	NUWC/Newport : RI	2.174	1.465	Oct 2021	0.080	Nov 2022	0.100	Nov 2023	-		0.100	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	MIPR	USACE : AK	5.771	1.234	Dec 2021	2.750	Nov 2022	0.000		-		0.000	0.000	9.755	-
Operational Test & Evaluation (OT&E)	MIPR	USTRANSCOM : IL	3.170	2.107	Jan 2022	0.000		2.231	Dec 2023	-		2.231	Continuing	Continuing	Continuing
Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E)	C/CPFF	UT/ARL : TX	1.444	0.000		0.000		0.000		-		0.000	0.000	1.444	Continuing
Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E)	C/CPFF	UW/APL : WA	15.827	0.000		0.000		0.000		-		0.000	0.000	15.827	Continuing
Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E)	C/CPFF	VAR* : VAR	0.339	0.000		0.000		0.000		-		0.000	0.000	0.339	-
Subtotal			84.978	8.776		6.737		6.938		-		6.938	Continuing	Continuing	N/A

Remarks

* Consists of multiple performing activities with funding for each not greater than \$1M per year

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603562N / Submarine Tactical Warfare Sys				Project (Number/Name) 1739 / Submarine Arctic W/F Development					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support - Acquisition, Business & Finance	C/CPAF	EG&G : VA	0.311	0.000		0.000		0.000		-		0.000	0.000	0.311	-
Program Management Support - Acquisition, Business & Finance	C/CPAF	BAE SYSTEMS : MD	1.088	0.000		0.000		0.000		-		0.000	0.000	1.088	-
Program Management Support - Acquisition, Business & Finance	C/CPIF	TMB : DC	0.551	0.125	Feb 2022	0.125	Dec 2022	0.130	Dec 2023	-		0.130	Continuing	Continuing	Continuing
Program Management Support - Arctic Scientist	C/CPIF	KMS Solutions : VA	0.000	0.125	Jan 2022	0.125	Dec 2022	0.000		-		0.000	0.000	0.250	-
Program Office Travel	Allot	NAVSEA PEO IWS 5 : DC	0.040	0.000		0.000		0.000		-		0.000	0.000	0.040	-
ICEX Event Travel*	Allot	NAVSEA PEO IWS 5 : DC	0.296	0.235	Oct 2021	0.095	Oct 2022	0.260	Oct 2023	-		0.260	Continuing	Continuing	Continuing
Subtotal			2.286	0.485		0.345		0.390		-		0.390	Continuing	Continuing	N/A
Remarks															
* ICEX Event Travel category reflects travel for the Arctic Submarine Lab personnel in support of ICEX, but is managed by NAVSEA PEO IWS 5 via the Defense Travel System (DTS) Cross-Organization process.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			87.264	9.261		7.082		7.328		-		7.328	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603562N / Submarine Tactical Warfare Sys

Project (Number/Name)

1739 / Submarine Arctic W/F Development

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
Project 1739	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
ICEX Missions	ICEX 2022 Plan. ▲	ICEX 2022 Analysis/Reporting			ICEX 2024 Planning				△	ICEX 2024 Analysis/Reporting		ICEX 2026 Planning				△	ICEX 2026 Analysis/Reporting		ICEX 2028 Planning				△	ICEX 2028 Analysis/Reporting				
	ICEX 2022 (TACDEV / TORPEX)								ICEX 2024 (TACDEV)								ICEX 2026 (TACDEV / TORPEX)								ICEX 2028 (TACDEV)			
Ice Camps (Arctic Ocean)	Ice Camp 2022								Ice Camp 2024								Ice Camp 2026								Ice Camp 2028			
ARCEX Missions					ARCEX 2023								ARCEX 2025								ARCEX 2027							
Arctic Workup (at sea)	Arctic Workup																											
Arctic Training	Arctic Training																											
Arctic Deployment (at sea)	Arctic Deployment																											
Arctic Transit Mission (at sea)	Arctic Transit Mission																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603562N / <i>Submarine Tactical Warfare Sys</i>	Project (Number/Name) 1739 / <i>Submarine Arctic W/F Development</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 1739				
ICEX Missions: ICEX Mission 2022 (TACDEV / TORPEX) Planning/Logistics	1	2022	1	2022
ICEX Missions: ICEX Mission 2022 (TACDEV / TORPEX)	2	2022	2	2022
ICEX Missions: ICEX Mission 2022 (TACDEV / TORPEX) Post-ICEX Analysis/Reporting	3	2022	4	2022
ICEX Missions: ICEX Mission 2024 (TACDEV) Planning/Logistics	1	2023	1	2024
ICEX Missions: ICEX Mission 2024 (TACDEV)	2	2024	2	2024
ICEX Missions: ICEX Mission 2024 (TACDEV) Post-ICEX Analysis/Reporting	3	2024	4	2024
ICEX Missions: ICEX Mission 2026 (TACDEV / TORPEX) Planning/Logistics	1	2025	1	2026
ICEX Missions: ICEX Mission 2026 (TACDEV / TORPEX)	2	2026	2	2026
ICEX Missions: ICEX Mission 2026 (TACDEV / TORPEX) Post-ICEX Analysis/Reporting	3	2026	4	2026
ICEX Missions: ICEX Mission 2028 (TACDEV) Planning/Logistics	1	2027	1	2028
ICEX Missions: ICEX Mission 2028 (TACDEV)	2	2028	2	2028
ICEX Missions: ICEX Mission 2028 (TACDEV) Post-ICEX Analysis/Reporting	3	2028	4	2028
Ice Camps: Ice Camp (Arctic Ocean) 2022	1	2022	3	2022
Ice Camps: Ice Camp (Arctic Ocean) 2024	1	2024	3	2024
Ice Camps: Ice Camp (Arctic Ocean) 2026	1	2026	3	2026
Ice Camps: Ice Camp (Arctic Ocean) 2028	1	2028	3	2028
ARCEX Missions: ARCEX 2023	1	2023	4	2023
ARCEX Missions: ARCEX 2025	1	2025	4	2025
ARCEX Missions: ARCEX 2027	1	2027	4	2027
Arctic Workup (At-Sea): Arctic Workup (At Sea)	1	2022	4	2028

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603562N / Submarine Tactical Warfare Sys		Project (Number/Name) 1739 / Submarine Arctic W/F Development	
	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
Arctic Training: Arctic Training	1	2022	4	2028
Arctic Submarine Deployment as required by the Submarine Type Commander: Arctic Submarine Deployment as required by the Submarine Type Commander	1	2022	4	2028
Arctic Transit Mission (At Sea): Arctic Transit Mission (At Sea)	1	2022	4	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	435.621	132.244	130.405	89.939	-	89.939	87.041	83.795	97.314	89.856	Continuing	Continuing
2196: Design, Tools, Plans and Concepts	24.613	15.256	17.369	15.345	-	15.345	21.788	24.039	27.657	33.172	Continuing	Continuing
3161: NAVSEA Tech Authority	282.574	13.612	11.569	11.466	-	11.466	8.639	8.701	8.784	8.929	Continuing	Continuing
3244: Cybersecurity Engineering	15.468	14.914	15.509	36.117	-	36.117	37.628	38.138	38.648	39.160	Continuing	Continuing
3376: Strategic Sealift	29.545	8.759	7.166	6.134	-	6.134	4.696	4.201	4.268	4.255	Continuing	Continuing
3505: Maritime Prepositioning Force Next	0.000	0.000	0.000	1.502	-	1.502	1.503	2.539	16.485	2.485	Continuing	Continuing
4044: Medium Landing Ship	20.030	12.667	12.167	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	44.864
4045: Next Generation Medium Logistics Ship	19.978	20.384	2.959	8.810	-	8.810	7.737	2.149	1.472	1.855	Continuing	Continuing
5010: AS(X) Submarine Tender	0.000	15.781	15.466	10.565	-	10.565	5.050	4.028	0.000	0.000	0.000	50.890
9999: Congressional Adds	43.413	30.871	48.200	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	122.484

A. Mission Description and Budget Item Justification

Project 2196 - This project provides the analytical foundation for making informed force structure, capability and affordability decisions in the development of all future surface ship platforms, weapons, sensors and combat systems. It realizes this through total ship system engineering, technology integration, cost estimation, mission effectiveness analysis, force architecture synthesis, and force-level effectiveness analysis, as well as continuous development of the people, tools and processes required to accomplish these efforts efficiently. This includes early-stage concept development studies for all potential future surface ships. It also includes quantitative mission and force-level analysis to identify future capability gaps and requirements related to advances in threat capabilities, and evaluation of the effectiveness and affordability of potential future technology and concept of operations (CONOP) solutions. Results from this project are used to inform senior Navy leadership in support of budgetary decisions, Capability Evolution Plans (CEP), and requirements related to surface ship force structure, platforms and major combat system elements.

Project 3161 - This project is the only R&D effort that provides a coordinated approach to the development of cross platform ship and weapon system designs and technologies "common" to multiple ships and systems. This project directly influences technical standards for design, construction, certification and operation and provides an avenue for innovative solutions and technologies to compete with legacy product requirements and specifications. This project conducts risk reduction of alternative technical architectures, designs and technology solutions that meet Fleet operational and technical requirements at lower cost; and develops engineering capabilities in the areas of design tools, criteria and methods. This project funds a prioritized portfolio of time-sensitive initiatives through the Cross Platform Systems Development (CPSD) Program, supporting NAVSEA Technical Authority and associated risk reduction activity. The areas of exploration for the CPSD Program include Ship Technology Improvements, Fleet Maintenance and Life Cycle Cost Reduction, Advanced Manufacturing and Material Technology, Additive Manufacturing, Digital

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 0603563N / <i>Ship Concept Advanced Design</i>
<p>Framework/Electromagnetic Environment and Development and Unmanned Systems. The research products developed by this project directly support and influence both current Fleet requirements and future acquisition programs by providing a range of technically acceptable alternatives and evaluation of emerging technologies. The prototypes, standards/specs, tools and processes and other products developed in this project focus on technical requirements and technologies applicable to multiple ship classes or systems. Products from this project transition directly to early-stage ship design for Ship Preliminary Design and Feasibility Studies, Program Executive Office (PEO) ship acquisition programs, and Systems Engineering Technical Authority (SETA) requirements documentation. Tasks within this project include R&D efforts focused on increasing sustainment technologies and improving performance at reduced cost for current and future naval platforms. This Project supports the Navy National Shipbuilding Research Program (NSRP).</p> <p>Project 3505 - The MPF(X) ships will recapitalize the aging BOBO Class maritime prepositioning ships. The 'Sealift the Nation Needs' report to Congress defines a three-phase Sealift Recapitalization approach: Service Life Extensions, Acquiring Used ships, and new construction. The MPF(X) portion represents the prepositioning new construction aspect of the three-phase sealift recapitalization approach. USNS BOBO class ships will retire from service beginning in FY 2033. Conduct of an Analysis of Alternatives (AoA) and draft of a Capabilities Development Document (CDD) are planned beginning in FY 2024.</p> <p>Project 3244 - This effort funds the research, design, development, testing, and installation of Cybersecurity solutions for all installed integrated computer networks to include shipboard Hull Mechanical and Electrical (HM&E), Navigation Systems, Combat Systems, Fire Control, Sonar, Radar, Communications and all other shipboard computerized control systems for all afloat U.S. Navy platforms. Cybersecurity Engineering supports the development of specifications and standards for the Cybersecurity of all Navy Control Systems (NCS).</p> <p>Project 3376 - Strategic Sealift Research and Development - Develops new concepts and technologies which can be applied to or will enable future strategic sealift, and Seabasing systems. The technologies include ship configuration concepts, equipment to increase cargo handling and cargo loading/unloading rates (including commercial and merchant ship systems), improved man/machine interfaces, improved structural configurations and materials, and Logistics-Over-the-Shore (LOTS) equipment and system improvements. FY2016 and prior years (FY2014 and earlier) efforts were financed under the National Defense Sealift Fund (NDSF) BA 04 Project 3116 Strategic Sealift Research and Development. FY 2015, FY 2017, and FY 2019 and future efforts are financed under this program element and project (3376).</p> <p>Project 4044 - The Light Amphibious Warship (LAW) will be referred to as the Medium Landing Ship (LSM) going forward to align with the mission and distinguish between traditional amphibious ships. LSM is a medium-sized landing ship that enables distributed maneuver and logistics such as Distributed Maritime Operations (DMO), Littoral Operations in a Contested Environment (LOCE), and Expeditionary Advanced Base Operations (EABO) in support of the newly established Marine Littoral Regiment (MLR). It is designed to fill the gap in capability between the Navy's large, multipurpose amphibious warfare class ships and smaller landing vessels. This ship will deploy tailored logistics, select power projection and strike capabilities. Beginning in FY 2024, LSM is shown under PE 0603564N, Ship Preliminary Design and Feasibility Studies, to better align with the scope of work of the program.</p> <p>Project 4045 - The Next Generation Logistics Ship (NGLS) is planned to be a new class of ships to augment the traditional Combat Logistics Force (CLF) to enable refueling, rearming, and resupply of Naval assets - afloat and ashore - near contested environments via ship-to-ship operations and ship-to port operations in support of Distributed Maritime Operations (DMO), Littoral Operations Contested Environment (LOCE), and Expeditionary Advanced Base Operations (EABO). Augmenting</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0603563N I Ship Concept Advanced Design				
the traditional CLF, NGLS will provide a flexible, responsive platform to move fuel, personnel, equipment, and supplies between ships, advanced bases, ports, and dispersed nodes of the sea base; sustaining afloat (Surface Action Group) and ashore (Expeditionary Advanced Base) requirements. RDT&E funding will continue to support development of the NGLS ship design(s), specification development, affordability analyses, and definition of ship mission systems leading to Detail Design & Construction award of the lead ship in FY 2026.						
Project 5010 - This project supports Submarine Tender Recapitalization Acquisition Documentation development, Preliminary Design, Detail Design, Program Management/Engineering Services and Total Ship Integration. The Submarine Tender approach leverages current Submarine Tender capabilities, Nuclear Support Facility, integrating new VACL and CLB capabilities into the requirements generation and shipbuilding contracts. Identified missions include Submarine Tending, Re-arming, re-supply of material, medical/dental, Nuclear Support, Submarine Systems repair and other maintenance support. Funding will inform requirements definition, early industry engagement preliminary designs, trade studies, and follow-on assessment for Sub Tender.						
Project 9999 (Congressional Add)- Funding provided in the Department of Defense Appropriations Act, 2023 for defense industrial skills and technology training systems, marine energy systems for sensors and microgrids, digital maintenance advisor for shipboard readiness, metallic additive manufacturing, and critical protection technology for cybersecurity engineering.						
B. Program Change Summary (\$ in Millions)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget		136.074	82.205	108.811	-	108.811
Current President's Budget		132.244	130.405	89.939	-	89.939
Total Adjustments		-3.830	48.200	-18.872	-	-18.872
• Congressional General Reductions		-	-			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	48.200			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-3.830	0.000			
• Program Adjustments		0.000	0.000	-20.185	-	-20.185
• Rate/Misc Adjustments		0.000	0.000	1.313	-	1.313
Congressional Add Details (\$ in Millions, and Includes General Reductions)					FY 2022	FY 2023
Project: 9999: Congressional Adds						
Congressional Add: Marine energy systems for sensors and microgrids					0.000	15.000
Congressional Add: High pressure cold spray system					9.647	0.000
Congressional Add: Defense industrial Skills and Technology Training					0.000	10.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023	
Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 0603563N / <i>Ship Concept Advanced Design</i>	
<u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u>		FY 2022	FY 2023
Congressional Add: <i>Polymorphic Build Farm for Open Source Technologies</i>		9.647	0.000
Congressional Add: <i>Metallic additive manufacturing</i>		4.824	4.000
Congressional Add: <i>Critical protection technology for cybersecurity engineering</i>		6.753	11.700
Congressional Add: <i>Digital maintenance advisor for shipboard readiness</i>		0.000	7.500
Congressional Add Subtotals for Project: 9999		30.871	48.200
Congressional Add Totals for all Projects		30.871	48.200
<u>Change Summary Explanation</u> Program adjustments include: <p>Project 2196 Design, Tools, Plans, and Concepts: Funds added in support of the Collaborative Enduring Concepts and Tools (COLLECT) effort.</p> <p>Project 3376 Strategic Sealift: Funds decreased for proper phasing to support preliminary design contracts.</p> <p>Project 4044 Light Amphibious Warship: Funds decreased due to realignment of effort to PE 0603564N, Ship Preliminary Design & Feasibility Studies, to better align with the scope of work of the program.</p> <p>Project 4045 Next Generation Medium Logistics Ship: Funds increased in support of Preliminary Design and engineering efforts in support of the lead ship.</p> <p>Project 5010 AS(X) Submarine Tender: Funds decreased in RDT&E in preparation of planned AS(X) Detail, Design, and Construction (DD&C) contract award.</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design				Project (Number/Name) 2196 / Design, Tools, Plans and Concepts			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2196: Design, Tools, Plans and Concepts	24.613	15.256	17.369	15.345	-	15.345	21.788	24.039	27.657	33.172	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 2196 - This project provides the analytical foundation for making informed force structure, capability and affordability decisions in the development of all future surface ship platforms, weapons, sensors and combat systems. It realizes this through total ship system engineering, technology integration, cost estimation, mission effectiveness analysis, force architecture synthesis, and force-level effectiveness analysis, as well as continuous development of the people, tools and processes required to accomplish these efforts efficiently. This includes early-stage concept development studies for all potential future surface ships. It also includes quantitative mission and force-level analysis to identify future capability gaps and requirements related to advances in threat capabilities, and evaluation of the effectiveness and affordability of potential future technology and concept of operations (CONOP) solutions. Results from this project are used to inform senior Navy leadership in support of budgetary decisions, Capability Evolution Plans (CEP), and requirements related to surface ship force structure, platforms and major combat system elements.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Future Surface Combatant Force (FSCF) Analysis	9.485	8.216	6.680	0.000	6.680
Articles:	-	-	-	-	-
<p>Description: Description: FSCF analysis focuses on the long time-horizon, approximately 20-25 years in the future, to understand necessary changes in the surface combatant force's structure and capabilities and informs near-term decisions and planning that drive these changes. FSCF Analysis provides warfighting effectiveness and cost analysis of force structure and concept of operations/employment (CONOP/CONEMP) alternatives, ship and combat system requirements, and key technology enablers for the FSCF to address future threats. It generates insights supporting budgetary decisions by senior Navy leadership and assists in establishing Capability Evolution Plans (CEP), as well as long-term future requirements for all future surface combatant ships and major combat system elements.</p> <p>FY 2023 Plans: Re-baseline analysis to capture key acquisition, technology, CONOPs and threat developments.</p> <p>FY 2024 Base Plans: Excursion Analysis, including evaluation of FY 2023 results' sensitivity to key assumptions and exploration of additional cost, capability and CONOP tradeoffs.</p> <p>FY 2024 OCO Plans:</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design		Project (Number/Name) 2196 / Design, Tools, Plans and Concepts		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: Reduction in FY 2023 to FY 2024 request due to reduction in work scope and transfer of activities into Ship Design Tool and Workforce Development task activity (3) and continued analytic efficiencies realized through work product re-use and workforce learning.						
Title: Naval Capability Integration Process (NCIP) - From the Sea (FTS) Articles: Description: NCIP is an annual process analyzing current, programmed, and non-programmed near-term capability alternatives relative to stressing threats in the short time-horizon, which is approximately 10 years in the future. NCIP-FTS focuses on surface combatant contributions to integrated effects chains, especially for Naval Surface Fires and Integrated Air and Missile Defense, which is aligned with NCIP From the Air (FTA), Information Warfare (IW), Anti-Submarine Warfare (ASW), and Marine Corp efforts. NCIP evaluates platform, weapon, sensor and combat system capabilities to address warfighting requirements and gaps. Additionally, it supports investment decisions that focus resources where they will have the greatest warfighting impact. FY 2023 Plans: Execute NCIP-FTS process and provide analytical insights to support surface combatant related investment decisions. FY 2024 Base Plans: Conduct mission and force-level effectiveness analysis via the annual NCIP-FTS process. Evaluate the ability of current, programmed and non-programmed near-term capabilities to address capability requirements and gaps within integrated effects chains relative to future stressing threats. Execute NCIP-FTS systems of systems analysis against the projected threat and provide quantitative analytical data to support Navy Leadership Program Objective Memorandum warfighting capability decisions. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Decrease in the funding request from FY 2023 to FY 2024 to reflect proper phasing of funding in support of the NCIP effort.		4.271 -	4.414 -	3.665 -	0.000 -	3.665 -
Title: Ship Design Tool and Workforce Development		1.500	1.939	5.000	0.000	5.000

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design		Project (Number/Name) 2196 / Design, Tools, Plans and Concepts	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Articles:	-	-	-	-	-
<p>Description: Develop and maintain the ship design workforce and tools that are critical enablers for affordable and effective maturation of new surface ship programs through continuous concept development and engineering analysis. Tool development focus areas include general rapid ship design and integration and domain specific tools such as those for assessment of shock, damage, hydrodynamics, structures and cost. It also includes utilization of high performance computing (HPC) environments to achieve improved tool fidelity and efficiency. Lastly, it funds workforce development initiatives to develop the next generation naval engineering workforce.</p> <p>FY 2023 Plans: Continue development of ship design and analysis tools to improve efficiency and fidelity. Support mentorship, knowledge transfer, foundational training, and career development opportunities to develop the next generation naval engineering workforce.</p> <p>FY 2024 Base Plans: Increase development of ship design and analysis tools to improve efficiency and fidelity. Support mentorship, knowledge creation, capture, and transfer, foundational training, and career development opportunities to develop the next generation naval engineering workforce. Establish the Collaborative, Enduring, Concepts and Tools (COLLECT) effort which accelerates the warfighting advantage through the development of the engineering and analytic workforce along with the tools that enable their work. COLLECT continuously executes warfighting analysis and concept design across the surface force to validate warfighting requirements and the platforms that best host them, as opposed to the formerly ad hoc nature of those efforts. This will maintain an experienced workforce ready to execute engineering tasking and developing and sustaining the appropriate toolsets for their trades, including combat systems and mission level analysis, power and energy tools, and naval engineering and susceptibility analysis. The continuous efforts of COLLECT enable the efficient transition of appropriate capabilities into programs of record and validation of resource decision impacts.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase to FY 2024 budget from \$1.939M to \$5.000M increases scope and deliverables for the naval engineering workforce and the tool creation because of the standup of the COLLECT initiative.</p>					
Title: Amphibious Capabilities Based Assessment	0.000	2.800	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023				
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design	Project (Number/Name) 2196 / Design, Tools, Plans and Concepts				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Articles:			-	-	-	-	-
<p>Description: The Amphibious Capabilities Based Assessment (CBA) will identify capability gaps, capacity shortfalls, and risks in the amphibious force in the 2030s and beyond in the context of the Navy's projected roles, missions, and tasks. It will evaluate and prioritize the spectrum of mission needs and required capabilities for the future amphibious ships to support operational concepts in a contested environment; namely Distributed Maritime Operations (DMO), Littoral Operations in a Contested Environment (LOCE), and Expeditionary Advanced Base Operations (EABO). It will provide recommendations for potential non-materiel and materiel approaches to the gaps, including the need for modified or new amphibious ships to meet future needs and pace future threats. This analysis will ensure the Marines have the platforms, tactics, and equipment they need to operate effectively in the new USMC missions and operational profiles. This assessment will act as the analytic basis for the development of an Initial Capabilities Document (ICD) and inform a future Analysis of Alternatives (AoA).</p> <p>FY 2023 Plans: The Amphibious Capabilities Based Assessment (CBA) will identify capability gaps, capacity shortfalls, and risks in the amphibious force in the 2030s and beyond in the context of the Navy's projected roles, missions, and tasks. It will evaluate and prioritize the spectrum of mission needs and required capabilities for the future amphibious ships to support operational concepts in a contested environment; namely Distributed Maritime Operations (DMO), Littoral Operations in a Contested Environment (LOCE), and Expeditionary Advanced Base Operations (EABO). It will provide recommendations for potential non-materiel and materiel approaches to the gaps, including the need for modified or new amphibious ships to meet future needs and pace future threats. This analysis will ensure the Marines have the platforms, tactics, and equipment needed to operate effectively in the new USMC missions and operational profiles. This assessment will act as the analytic basis for the development of an Initial Capabilities Document (ICD) and inform a future Analysis of Alternatives (AoA).</p> <p>FY 2024 Base Plans: No FY 2024 Base Plans, as this was an FY 2023 funded activity in PU 2196.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Funding decrease due to no planned tasking in FY 2024.</p>							
Accomplishments/Planned Programs Subtotals			15.256	17.369	15.345	0.000	15.345

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design	Project (Number/Name) 2196 / Design, Tools, Plans and Concepts

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

This is a non-acquisition program for engineering and analysis to inform Navy leadership decisions and plans, as well as to improve and sustain Navy capabilities for ship design and analysis. Work is performed by Navy Warfare Centers and Government Labs with contractor support.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design				Project (Number/Name) 2196 / Design, Tools, Plans and Concepts					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	C/CPFF	FSCF Analysis Various Contractors : Various	9.803	1.000	Jan 2022	0.800	Feb 2023	0.800	Feb 2024	-		0.800	Continuing	Continuing	Continuing
Systems Engineering	WR	FSCF Analysis NSWC : Various	13.060	8.485	Oct 2021	7.416	Oct 2022	5.880	Oct 2023	-		5.880	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	NCIP NSMA : Washington DC	0.700	1.000	Jan 2022	1.000	Feb 2023	1.000	Feb 2024	-		1.000	Continuing	Continuing	Continuing
Systems Engineering	WR	NCIP NSWC : Various	0.300	3.271	Nov 2021	3.414	Oct 2022	2.665	Oct 2023	-		2.665	Continuing	Continuing	Continuing
Systems Engineering	WR	Tools & Workforce Development NSWC : Various	0.750	1.500	Jan 2022	1.939	Oct 2022	5.000	Oct 2023	-		5.000	Continuing	Continuing	Continuing
Systems Engineering	WR	Amphibious CBA NSWC : Various	0.000	0.000		1.000	Nov 2022	0.000		-		0.000	0.000	1.000	-
Systems Engineering	C/CPFF	Amphibious CBA Various Contractors : Various	0.000	0.000		1.800	Feb 2023	0.000		-		0.000	0.000	1.800	-
Subtotal			24.613	15.256		17.369		15.345		-		15.345	Continuing	Continuing	N/A
Remarks Funding increase in support of the Collaborative Enduring Concepts and Tools (COLLECT) effort.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			24.613	15.256		17.369		15.345		-		15.345	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

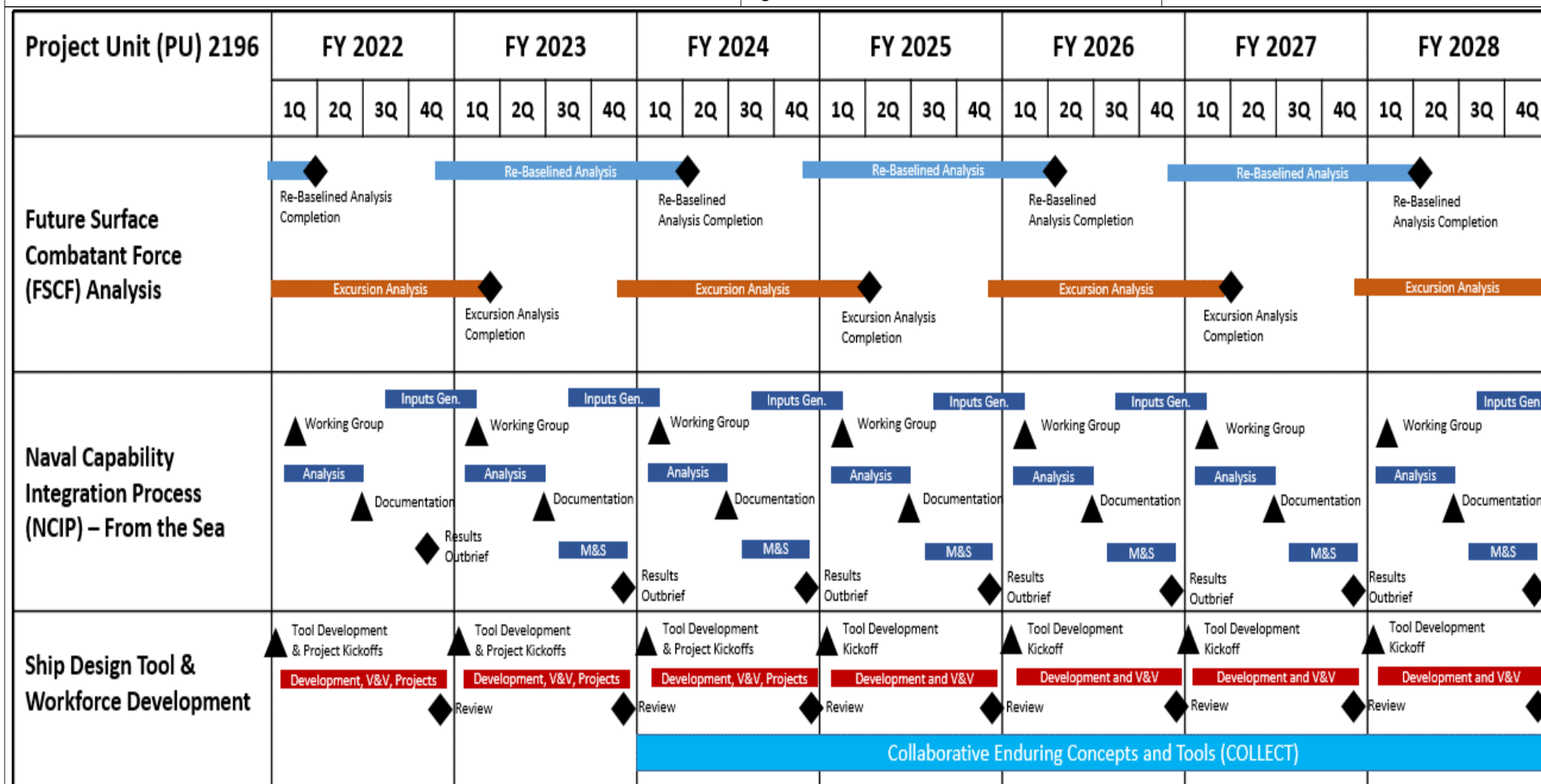
1319 / 4

R-1 Program Element (Number/Name)

PE 0603563N / *Ship Concept Advanced Design*

Project (Number/Name)

2196 / *Design, Tools, Plans and Concepts*



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design	Project (Number/Name) 2196 / Design, Tools, Plans and Concepts

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2196				
Proj 2196A: Future Surface Combatant Force Analysis	1	2022	4	2028
Proj 2196B: Naval Capability Integration Process - From the Sea	1	2022	4	2028
Proj 2196C: Ship Design Tools Development	1	2022	4	2028
Proj 2196D: Amphibious Capabilities Based Assessment (CBA)	1	2023	1	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design				Project (Number/Name) 3161 / NAVSEA Tech Authority			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3161: NAVSEA Tech Authority	282.574	13.612	11.569	11.466	-	11.466	8.639	8.701	8.784	8.929	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Cross Platform System Development (CPSD) Pillars were re-baselined in FY19 to better address CNO and NAVSEA Chief Engineer (SEA05) technical priorities. Starting in FY23 the CPSD will evolve away from the Pillar structure to improve efficiency.

A. Mission Description and Budget Item Justification

This project has been established to support the NAVSEA Technical Authority with the coordination of design and development efforts for cross-platform applicability to result in more affordable, mission-capable, and interoperable surface ship forces including ships that are less expensive to build and operate with reduced manning, reduced support costs, and greater utilization of emerging technology.

NAVSEA Tech Authority efforts under Project Unit (PU) 3161, known as the Cross Platform Systems Development (CPSD) Program, transition directly to early-stage ship design for Ship Preliminary Design and Feasibility Studies and other Program Executive Office (PEO) ship design programs. While these efforts support concept exploration and mission needs assessment for potential future ship acquisition programs, they also develop cross-program technology solutions and associated Technical Authority products. The CPSD efforts are not direct efforts for specific, authorized shipbuilding programs. This project is the only R&D effort that provides a coordinated, collaborative approach to the development of cross-platform naval ship and weapon system design, as well as engineering capabilities in the areas of design tools, criteria, and methods. The CPSD project also provides innovative solutions for current fleet issues involving Technical Authority, such as interoperability issues with new systems or platforms and/or broad technology insertion topics. In addition, PU 3161 also includes Additive and Advanced Manufacturing Technology, which focuses heavily on naval ship-specific Additive Manufacturing (AM) technology and transition.

In FY23, CPSD is re-baselined to improve efficient and resilient alignment to CNO and NAVSEA Chief Engineer (SEA05) technical requirements and priorities. CPSD maintains the use of established functional areas for scope prioritization and portfolio diversification; however, the use of pillars for funding allocation has hindered responsiveness and agility. New in FY23, CPSD established the project focusing on the functional area "Support of Technical Authority."

Project Unit 3161 includes efforts of the Additive Manufacturing (AM) program. The AM program focuses on development and use of AM equipment for Naval applications in land-based and afloat applications, including system performance requirements, shipboard integration requirements and considerations, material selection, design optimization, equipment and component certification, and digital engineering integration. Efforts also include considerations of AM applicability across a wide variety of potential applications ensuring AM manufactured components can meet mission requirements.

In FY24, Project Unit 3161 also includes the Learning to Action Board (L2AB) Firefighting Program. Following the USS Bonhomme Richard fire, the L2AB Firefighting Program was stood up to research and develop solutions for damage control and firefighting issues identified in a subsequent Major Fires Review. This program funds

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
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critical efforts in shipboard fire detection/suppression systems, fire prevention features, and advanced firefighting equipment. Programs that were directed by the Vice Chief of Naval Operations will be tracked to completion.						
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Ship Technology Improvements (CPSD A)		1.300	0.000	0.000	0.000	0.000
Articles:		-	-	-	-	-
Description: This effort funds the analysis of ship system technologies to reduce design and construction costs. This also includes the development of validation tools to certify the safety and mission capability of platform concepts and eventually ships.						
FY 2023 Plans:						
The use of pillars as a funding function is discontinued in FY 2022. The program intends to track funds at the project level to increase agility and responsiveness to the changing naval environment.						
FY 2024 Base Plans:						
N/A						
FY 2024 OCO Plans:						
N/A						
Title: Fleet Maintenance and Life Cycle Cost Reduction (CPSD B)		1.512	0.000	0.000	0.000	0.000
Articles:		-	-	-	-	-
Description: This effort funds the development of tools, analyses and technologies to reduce fleet life cycle costs, reduce life-cycle failure risk and improved refurbishment cycles. This will allow the Navy to better meet fleet operational and technical requirements and lower cost.						
FY 2023 Plans:						
The use of pillars as a funding function is discontinued in FY 2022. The program intends to track funds at the project level to increase agility and responsiveness to changing naval environment.						
FY 2024 Base Plans:						
N/A						
FY 2024 OCO Plans:						
N/A						
Title: Additive and Advanced Manufacturing Technology		10.563	7.958	6.564	0.000	6.564
Articles:		-	-	-	-	-

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total

Description: This effort funds the development of additive manufacturing technologies, advanced coating techniques, design and topology optimization, materials selection, characterization and process development.

FY 2023 Plans:

FY23 funding continues additive manufacturing (AM) technology RDT&E for metal and polymer components including materials characterization and process development, development of AM design and manufacturing standards, application and technical data package development; determining AM equipment performance requirements in dynamic environments (i.e. shipboard), ship integration requirements for AM equipment, afloat AM qualification of equipment and certification of components in shipboard environments and navy-specific AM industrial base requirements including digital file transfer and cyber. This funding will also enable exploration for the additive manufacturing of energetic materials and manufacturing/repair of printed circuit boards for electronic applications.

FY 2024 Base Plans:

FY24 funding continues additive manufacturing (AM) technology RDT&E for metal and polymer components including materials characterization and process development, development of AM design and manufacturing standards, application and technical data package development; determining AM equipment performance requirements in dynamic environments (i.e. shipboard), ship integration requirements for AM equipment, afloat AM qualification of equipment and certification of components in shipboard environments and navy-specific AM industrial base requirements including digital file transfer and cyber. This funding will also enable continued exploration for the additive manufacturing of energetic materials and manufacturing/repair of printed circuit boards for electronic applications. This funding will also begin investment in specification and standard development for binder jetting AM technology.

FY 2024 OCO Plans:

N/A

FY 2023 to FY 2024 Increase/Decrease Statement:

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design	Project (Number/Name) 3161 / NAVSEA Tech Authority				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Reduction in the budget from FY 2023 to FY 2024 of \$1.394M is due to technical publications (tech pub) development in FY 2023 and we will also install and evaluate our metal system for shipboard use in FY23, causing a reduction in the scope of work from FY 2023 to FY 2024.						
Title: Digital Framework/Electromagnetic Environment and Development (CPSD D) Articles: Description: Develop an understanding of the wireless electromagnetic environment (EME) on numerous ship classes and the vulnerability of these systems to hacking. FY 2023 Plans: The use of pillars as a funding function is discontinued in FY 2022. The program intends to track funds at the project level to increase agility and responsiveness to a changing naval environment. FY 2024 Base Plans: N/A FY 2024 OCO Plans: N/A		0.237 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: CPSD Support of Technical Authority Articles: Description: The CPSD effort funds the analysis of ship system technologies to reduce design and construction costs and tools, analyses and technologies to reduce fleet life cycle costs, reduce life-cycle failure risk and improved refurbishment cycles. Efforts also include the development of validation tools to certify the safety and mission capability of platform concepts and eventually ships, development of advanced manufacturing capabilities, understanding of advanced and additive manufacturing technical properties pertaining to their application in a naval environment, develop an understanding of the changing electromagnetic environment (EME) in the naval environment, adjust and develop practices and standards, development an understanding of digital engineering processes, methodologies, and systems for efficient and cost effective engineering analysis, risk analysis, and risk reduction. CPSD also supports technical authority needs for emerging unmanned systems platforms. FY 2023 Plans: In FY 2023, continue the development of ship construction technology improvements to reduce risk related to alternative technical architectures and designs. Current planned align to technical pillars as follows: Additive &		0.000 -	3.611 -	3.745 -	0.000 -	3.745 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design	Project (Number/Name) 3161 / NAVSEA Tech Authority			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Advanced Manufacturing, Digital Framework / Electromagnetic Environment, Fleet Maintenance & Life Cycle Cost Reduction, Ship Technology Improvements, and CHENG Emergent Technical Needs.						
<p>The following efforts are scheduled for completion upon exhaustion of FY23 funds:</p> <p>(*)Computed Tomography (Ship Tech Improvement) - a 3-dimensional non-destructive evaluation technique for new & complex parts including additively manufactured parts.</p> <p>(*)DC Arc Flash (Ship Tech Improvement) - identification of safety risk to ship and sailors of Electric Power / Direct Current Arc flashes critical to use of DC power sources for directed energy weaponry</p> <p>(*)Efficient Thermal Management Architecture - creation of a prototype architecture to enable 'sharing' of cooling through ship providing cooler where it is needed - enabler of directed energy weaponry</p> <p>(*)Mitigation of Stress Corrosion Cracking (Fleet Maint & LCC Reduction) - Mitigate stress corrosion cracking of Aluminum alloys utilized in fleet and under consideration for use on new platform designs (FFG, DDG(X), USVs)</p> <p>(*)Propulsion Shaft Sleeve Life Enhancement (Fleet Maint & LCC Reduction) - increase life of sleeve surrounding & protecting propulsion shaft. FY 2023 funds culminate in installation onboard US Navy asset (pending ship avail schedule slip).</p> <p>The following efforts are scheduled to begin as new efforts using FY23 funds:</p> <p>(*) Shock Analysis M&S of surface ship undersea appendages - This study will further investigate shock environment of undersea appendages leveraging FFG62 testing to enhance and refine M&S capabilities for future analysis needs and requirement development.</p> <p>(*) Hybrid Laser Arc Welding - detailing a method for evaluating HLAW toughness without the use of time- and labor-intensive SE testing and a set of standardized HLAW qualification requirements.</p> <p>(*) Bonded Fuel Tank Repair - establish the time for pressurized fuel oil to compromise a bonded repair applied to holes in steel fuel oil tanks and develop improved procedures necessary to perform the repairs.</p> <p>(*) Magnetic Treatment Study - Investigation of Necessity of post-construction Magnetic Treatment for surface ships with Advanced Degaussing systems.</p> <p>(*) Sensitization Prediction of AI photography using Machine Learning - Image-based machine learning (ML) techniques will be utilized to develop a software tool capable of accurately predicting DOS of an unknown image for all relevant types of marine grade Al.</p>						

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Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design		Project (Number/Name) 3161 / NAVSEA Tech Authority		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>(*) Investigation of use of Composition D for rolled non-skid applications - demonstrate non-skids on surface ships to validate their performance, add to the qualified products database (QPD) as approved products, then transition to the fleet for use.</p> <p>FY 2024 Base Plans: FY 2024 plans include:</p> <p>(*)Emerging Radar Electromagnetic Environment (Ship Tech Improvement) - Enhance current M&S capabilities to increase analytical detail, decrease risk, and decrease ship-by-ship survey requirement applying M&S to Hazards of Electromagnetic Radiation to Ordnance (HERO) program and others.</p> <p>(*)Tie-Down Fitting Preservation (Fleet Maint & LCC Reduction) - Increase life of US Navy tie-downs used to secure aircraft and materiel. These tie-downs are extreme cost to US NAVY require significant replacement</p> <p>(*) Transformer Standards (Ship Tech Improvement) - Update current 1980s specification for US Navy ship electric power transformers including use of 3-phase transformers being pushed by industry.</p> <p>(*) Rudder Twisted Encapsulation (Fleet Maint & LCC Reduction) - Utilize innovative encapsulation method to reinforce rudder and create a twisted provide to decrease cavitation. Results will increase life-space of legacy 'fleet rudders'. FY24 culminates in installation onboard US Navy platform (pending ship avail schedule).</p> <p>(*) Hybrid Laser Arc Welding - detailing a method for evaluating HLAW toughness without the use of time- and labor-intensive SE testing and a set of standardized HLAW qualification requirements.</p> <p>(*) Bonded Fuel Tank Repair - establish the time for pressurized fuel oil to compromise a bonded repair applied to holes in steel fuel oil tanks and develop improved procedures necessary to perform the repairs.</p> <p>(*) Magnetic Treatment Study - Investigation of Necessity of post-construction Magnetic Treatment for surface ships with Advanced Degaussing systems.</p> <p>(*) Sensitization Prediction of AI photography using Machine Learning - Image-based machine learning (ML) techniques will be utilized to develop a software tool capable of accurately predicting DOS of an unknown image for all relevant types of marine grade AI.</p> <p>(*) Investigation of use of Composition D for rolled non-skid applications - demonstrate these nonskids on surface ships to validate their performance, add to the qualified products database (QPD) as approved products, then transition to the fleet for use.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
CPSD budget increase from FY23 to FY24 is associated with the inclusion of the Learning 2 Action Board (L2AB) aligned firefighting research & development efforts.						
Title: Learning to Action Board (L2AB) Recommended Fire Detection/Suppression		0.000	0.000	1.157	0.000	1.157
Articles:		-	-	-	-	-
Description: The L2AB Recommended Fire Detection/Suppression program was stood up to research & develop solutions to damage control and firefighting issues identified in a subsequent Major Fires Review following the 2020 USS Bonhomme Richard fire. This program funds critical efforts in shipboard fire detection/suppression systems, fire prevention features, and advanced firefighting equipment; track programs to completion that were directed by the Vice Chief of Naval Operations.						
FY 2023 Plans:						
N/A						
FY 2024 Base Plans:						
Fund research & development for the following technologies: Torpedo suppression, Aviation Hose Devices, Nexgen FACUs, wireless FDS, FDS Network Tool, Alternate Fire Detectors.						
Torpedo Suppression: Characterize Torpedo Room fire hazard across submarine Fleet. Research and evaluate available suppression technologies that mitigate, suppress, or extinguish shipboard fire threats before catastrophic events involving munitions occur. Perform ship-check and data collection for development of Phase I SCD. Perform ship-check and data collection for development of Phase I SCD. Mature SCD and perform SHIPALT.						
Aviation Hose Devices: Research, procure and deploy replacement units. Perform NRE and develop prototype for FAT and verification.						
NEXGEN FACUs: Qualify and install next generation FACUs. Perform ship-check with OEM and either PY or an AIT and PY/AIT to develop SIDs for eventual installation.						
Wireless FDS: NSWCPD 336 conduct a study and provide alternate solutions. Travel to waterfronts, conduct study and provide alternate solutions. Procure one prototype system to install on a ship during an availability. Assess the efficacy of prototype system. Support waterfront activities in procuring and implementing alternate solutions.						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>FDS Network Tool: FDS ISEAs develop a tool documenting FDS configuration including FACUs, DAUs/IOUs, network switches, alarm consoles, and associated power panels to each per ship class. The FSC can then look at the planned work for an avail and use the tool to indicate which components will be taken offline by the planned industrial work. The tool will then illustrate the percentage of the system taken offline, the number of compartments without detection coverage, and where on the ship detection is lacking. Collect data on each ship class and build preliminary spreadsheet version of the risk assessment tool. Mature the tool and disseminate to Fire Safety Councils. Follow-on funding for tool maturation and deployment TBD.</p> <p>Alternate Fire Detectors: Find an alternate vendor to qualify compatible smoke, heat, and flame detectors. Write Performance spec and work with item manager to compete on contract. Possible witnessing Environmental Qualification Testing, working with item manager to develop provisioning. Follow-on work cost TBD and RDT&E.</p> <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Increase in funding from FY23 to FY24 is due to critical efforts in shipboard fire detection/suppression systems, fire prevention features, advanced firefighting equipment, and the tracking of programs to completion that were directed by the Vice Chief of Naval Operations.</p>					
Accomplishments/Planned Programs Subtotals	13.612	11.569	11.466	0.000	11.466

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• RDTEN/0204202N: <i>DDG-1000</i>	112.576	197.436	98.223	-	98.223	35.404	25.462	4.617	0.000	Continuing	Continuing
• RDTEN/0603512N: <i>Carrier Systems Development</i>	7.182	11.567	10.085	-	10.085	7.789	7.788	7.697	0.000	Continuing	Continuing
• RDTEN/0603564N: <i>Preliminary Design/Feasibility Studies.</i>	40.774	75.327	119.213	-	119.213	50.475	44.541	44.809	0.000	Continuing	Continuing
• RDTEN/0604567N: <i>Ship Contcept Design/Live Fire T&E</i>	54.829	60.791	58.149	-	58.149	58.576	40.996	40.503	0.000	Continuing	Continuing
• RDTEN/0603582N: <i>Combat System Integration</i>	17.322	18.236	18.589	-	18.589	18.291	18.608	18.870	0.000	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy							Date: March 2023		
Appropriation/Budget Activity 1319 / 4			R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design				Project (Number/Name) 3161 / NAVSEA Tech Authority		

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Remarks											

D. Acquisition Strategy

This is a non-acquisition program that develops, evaluates, and validates early stages of total ship concepts and technologies in support of SCN planning and potential future ship acquisition programs. This program also supports development, demonstration, evaluation, and validation of engineering tools, methods, and criteria for those concept designs and assessments. This program provides validated engineering tools, methods, and criteria for ship, and weapon system concept designs and assessments while fostering collaboration and coordination of efforts resulting in more effective use of funding.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced De sign				Project (Number/Name) 3161 / NAVSEA Tech Authority					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CPSD Systems Engineering	C/CPFF	Various Contractors : Various	18.786	0.000		0.458	May 2023	0.493	May 2024	-		0.493	Continuing	Continuing	Continuing
CPSD Engineering Support	WR	NSWCCD, NSWCPD, NRL : Various	64.355	0.745	Jan 2022	0.116	Oct 2022	0.094	Nov 2023	-		0.094	Continuing	Continuing	Continuing
CPSD Test and Evaluation	WR	NSWC : Various	12.111	0.000		0.232	Sep 2023	0.214	Sep 2024	-		0.214	Continuing	Continuing	Continuing
CPSD Systems Engineering	WR	NSWC DD : Dahlgren, VA	1.440	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CPSD Systems Engineering	WR	NSWC CD : Carderock, MD	6.458	0.511	Nov 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CPSD Systems Engineering	WR	NSWC PD : Philadelphia, PA	3.630	1.000	Nov 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CPSD Engineering Development	WR	NRL : Washington, D.C.	0.389	0.500	Nov 2021	0.232	Sep 2023	0.314	Sep 2024	-		0.314	Continuing	Continuing	Continuing
CPSD Engineering Development	WR	NSWC DD : Dahlgren, VA	2.584	0.000		0.207	Oct 2022	0.050	Nov 2023	-		0.050	Continuing	Continuing	Continuing
CPSD Engineering Development	WR	NSWC CD : Carderock, MD	5.143	0.000		1.490	Oct 2022	1.814	Nov 2023	-		1.814	Continuing	Continuing	Continuing
CPSD Engineering Development	WR	NSWC PD : Philadelphia, PA	2.330	0.000		0.668	Nov 2022	0.569	Nov 2023	-		0.569	Continuing	Continuing	Continuing
CPSD SBIR Withold	WR	Various : SBIR Withold	0.000	0.122	Jan 2022	0.144	Jan 2023	0.151	Jan 2024	-		0.151	Continuing	Continuing	Continuing
Cybersecurity Technologies	C/CPFF	JHU/APL : Baltimore, MD	10.331	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Cybersecurity Technologies	C/CPFF	MITRE : McLean, VA	1.108	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Cybersecurity Technologies	MIPR	PNNL DOE : Richland, WA	0.900	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Cybersecurity Technologies	WR	NUWC Keyport : Keyport, WA	0.550	0.000		0.000		0.000		-		0.000	0.000	0.550	-
Cybersecurity Technologies	WR	NUWC Newport : Newport, RI	2.306	0.000		0.000		0.000		-		0.000	0.000	2.306	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Cybersecurity Technologies	WR	NSWC Crane : Crane, IN	0.700	0.000		0.000		0.000		-		0.000	0.000	0.700	-
Cybersecurity Technologies	WR	NSWC DD : Dahlgren, VA	15.914	0.000		0.000		0.000		-		0.000	0.000	15.914	-
Cybersecurity Technologies	WR	NSWC PD : Philadelphia, PA	4.600	0.000		0.000		0.000		-		0.000	0.000	4.600	-
Additive Manufacturing	WR	NSWC CD : Carderock, MD	5.678	3.899	Nov 2021	2.261	Nov 2022	1.441	Nov 2023	-		1.441	Continuing	Continuing	Continuing
Additive Manufacturing	Various	NSWC PD : Philadelphia, PA	2.424	1.810	Nov 2021	1.360	Nov 2022	1.000	Nov 2023	-		1.000	Continuing	Continuing	Continuing
Additive Manufacturing	Various	NUWC Newport : Newport, RI	0.603	0.264	Nov 2021	0.196	Nov 2022	0.200	Nov 2023	-		0.200	Continuing	Continuing	Continuing
Additive Manufacturing	WR	NUWC Keyport : Keyport, WA	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	-
Additive Manufacturing	Various	NUWC Keyport : Mechanicsburg, PA	0.068	0.199	Nov 2021	0.150	Nov 2022	0.100	Nov 2023	-		0.100	Continuing	Continuing	Continuing
Additive Manufacturing	C/CPFF	JHU APL : Baltimore, MD	0.884	1.680	Jan 2022	0.800	Jan 2023	0.500	Nov 2023	-		0.500	Continuing	Continuing	Continuing
Additive Manufacturing	C/CPFF	PSU ARL : State College, PA	0.825	0.150	Jan 2022	0.000		0.000		-		0.000	0.000	0.975	-
Additive Manufacturing	C/CPFF	Various Contracts : Various	2.055	0.414	Jan 2022	0.307	Jan 2023	0.300	Jan 2024	-		0.300	Continuing	Continuing	Continuing
Additive Manufacturing	WR	NRL : Washington DC	0.125	0.000		0.000		0.000		-		0.000	0.000	0.125	-
Additive Manufacturing	WR	NSWC Port Hueneme : Port Hueneme, CA	0.075	0.068	Jan 2022	0.050	Nov 2022	0.050	Nov 2023	-		0.050	Continuing	Continuing	Continuing
Additive Manufacturing	WR	NAVAIR : Patuxent River, MD	0.100	0.075	Nov 2021	0.056	Nov 2022	0.050	Nov 2023	-		0.050	Continuing	Continuing	Continuing
Additive Manufacturing	WR	NSWC Crane : Crane, IN	0.153	0.150	Jul 2022	0.111	Nov 2022	0.250	Nov 2023	-		0.250	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design				Project (Number/Name) 3161 / NAVSEA Tech Authority					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Additive Manufacturing	WR	NSWC IH : Indian Head, MD	0.319	0.300	Nov 2021	1.150	Nov 2022	1.390	Nov 2023	-		1.390	Continuing	Continuing	Continuing
Additive Manufacturing	WR	Various : Not Specified	0.480	0.492	Nov 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Additive Manufacturing	Various	Various : SBIR Withold	0.656	0.134	Jan 2022	0.318	Jan 2023	0.256	Jan 2024	-		0.256	Continuing	Continuing	Continuing
NCR2T AM	WR	Various : Not Specified	1.275	0.000		0.000		0.000		-		0.000	0.000	1.275	-
NCR2T CPSD	WR	Various : Not Specified	0.776	0.000		0.000		0.000		-		0.000	0.000	0.776	-
NCR2T BTR	C/CPFF	Various : Not Specified	4.400	0.000		0.000		0.000		-		0.000	0.000	4.400	-
Prior Years G/WR	WR	Various : Not Specified	89.747	0.000		0.000		0.000		-		0.000	0.000	89.747	-
Prior Years C/CPFF	C/BA	Various : Not Specified	4.899	0.000		0.000		0.000		-		0.000	0.000	4.899	-
Additive Manufacturing	WR	NUWC Keyport : Portsmouth, NH	0.290	0.320	Oct 2021	0.237	Nov 2022	0.100	Nov 2023	-		0.100	Continuing	Continuing	Continuing
Additive Manufacturing	WR	NAVSUP : Mechanicsburg, PA	0.000	0.175	Jan 2022	0.130	Nov 2022	0.100	Nov 2023	-		0.100	Continuing	Continuing	Continuing
CPSD Engineering Development	WR	NRL : Washington, DC	0.000	0.000		0.057	Oct 2022	0.039	Nov 2023	-		0.039	Continuing	Continuing	Continuing
Additive Manufacturing	WR	GSA : Washington, DC	0.000	0.046	Feb 2022	0.034	Feb 2023	0.050	Feb 2024	-		0.050	Continuing	Continuing	Continuing
L2AB Firefighting Program	MIPR	Various : Washington, DC	0.000	0.000		0.000		0.139	Sep 2024	-		0.139	Continuing	Continuing	Continuing
L2AB Firefighting Program	C/BA	NSWCPD : Philadelphia, PA	0.000	0.000		0.000		1.018	Sep 2024	-		1.018	Continuing	Continuing	Continuing
Subtotal			269.567	13.054		10.764		10.682		-		10.682	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design				Project (Number/Name) 3161 / NAVSEA Tech Authority					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Cybersecurity Technologies	WR	NSWC CD : Carderock, MD	2.569	0.000		0.000		0.000		-		0.000	0.000	2.569	-
Cybersecurity Technologies	MIPR	NIWC : Various	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	-
Cybersecurity Technologies	C/CPFF	Various Contractors : Various	3.303	0.000		0.000		0.000		-		0.000	0.000	3.303	-
Subtotal			6.372	0.000		0.000		0.000		-		0.000	0.000	6.372	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NSWC CD : Carderock, MD	0.950	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	C/CPFF	JHU/APL : Baltimore, MD	1.650	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NSWC PD : Philadelphia, PA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Subtotal			2.600	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PM/Travel	Allot	NAVSEA HQ : Washington, DC	0.999	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Mgmt Spt	WR	NSWC CD : Carderock, MD	1.250	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Mgmt Spt	C/CPFF	CSC : Washington, D.C.	0.815	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design				Project (Number/Name) 3161 / NAVSEA Tech Authority					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Cybersecurity Technologies	C/CPFF	CSC : Washington, D.C.	0.250	0.000		0.000		0.000		-		0.000	0.000	0.250	-
Cybersecurity Technologies	C/CPFF	Alion : Washington, D.C.	0.250	0.000		0.000		0.000		-		0.000	0.000	0.250	-
Cybersecurity Technologies	MIPR	NAVSEA HQ : Washington, D.C.	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Additive Manufacturing	C/CPFF	Various : Various	0.464	0.508	Jun 2022	0.748	Oct 2022	0.694	Oct 2023	-		0.694	Continuing	Continuing	Continuing
Additive Manufacturing	Allot	Various : Not Specified	0.007	0.050	Dec 2021	0.057	Dec 2022	0.090	Dec 2023	-		0.090	Continuing	Continuing	Continuing
Subtotal			4.035	0.558		0.805		0.784		-		0.784	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			282.574	13.612		11.569		11.466		-		11.466	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																Date: March 2023																									
Appropriation/Budget Activity 1319 / 4										R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design										Project (Number/Name) 3161 / NAVSEA Tech Authority																					
Proj 3161										FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028							
										1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
CPSD A - Ship Technology Improvements										Ship Technology Improvements																															
CPSD B - Fleet Maintenance and Life Cycle Cost Reduction										Fleet Maintenance and Life Cycle Cost Reduction																															
Additive and Advanced Manufacturing Technologies																																									
CPSD D - Digital Framework/Electromagnetic Environment and Development										Digital Framework/Electromagnetic Environment and Development																															
CPSD E - Unmanned Systems										Unmanned Systems																															
CPSD Support of Technical Authority																																									
L2AB Recommended Fire Detection/Suppression														L2AB Recommended Fire Detection/Suppression																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design	Project (Number/Name) 3161 / NAVSEA Tech Authority	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3161				
CPSD A - Ship Technology Improvements:	1	2022	4	2022
CPSD B - Fleet Maintenance and Life Cycle Cost Reduction:	1	2022	4	2022
Additive and Advanced Manufacturing Technologies:	1	2022	4	2028
CPSD D - Digital Framework/Electromagnetic Environment and Development:	1	2022	4	2022
CPSD E - Unmanned Systems:	1	2022	4	2022
CPSD Support of Technical Authority:	1	2023	4	2028
L2AB Recommended Fire Detection/Suppression:	1	2024	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design				Project (Number/Name) 3244 / Cybersecurity Engineering			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3244: Cybersecurity Engineering	15.468	14.914	15.509	36.117	-	36.117	37.628	38.138	38.648	39.160	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This effort funds two critical Cybersecurity programs, Situational Awareness Boundary Enforcement and Response (SABER) and USS SECURE. SABER is the research, design, development, testing, and installation of Cybersecurity solutions for installed integrated computer networks to include shipboard Hull Mechanical and Electrical (HM&E), Navigation Systems, Combat Systems, Fire Control, Sonar, Radar, Communications and other shipboard computerized control systems for all afloat U.S. Navy platforms. USS SECURE is a cross-SYSCOM, operationally representative, distributed system of systems test environment that supports cybersecurity testing at the system, enclave, platform, and strike group level.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Cybersecurity Articles:								14.914	15.509	36.117	0.000	36.117
								-	-	-	-	-
FY 2023 Plans: SABER will execute two annual red team events as required for test and evaluation of Defensive Cyber Operations (DCO) capabilities. The Software Capability Toolkit (SCT) team will validate, qualify, and then incorporate five additional capabilities in FY 2023. This program will continue its mission to support the necessary development of core SABER software by delivering two software releases in FY 2023. This will support the configuration and assist PEO's in the deployment of advanced defensive cyber capabilities on afloat Navy platforms. As the Lead Cross-Platform Integration Manager, NAVSEA 03C will continue to manage and conduct all the non-recurring engineering, modifications, tailoring, and provide support to PEOs for life cycle maintenance and rule set maturity as executed by the respective PEOs. Manage SABER Configuration Control Board (CCB) to support existing installations and prioritize engineering changes to support unique OT for FY24 and FY25 installations. Software lifecycle sustainment requirements of reliability, maintainability, and supportability will be completed to support the 11 shipboard installations in FY 2023 and support the 14 SABER systems in the Fleet. In FY 2023, the program will stand up the Collection Architecture Integrated Product Team (IPT) to prepare for the Collection Architecture expansion in FY 2024. The program will continue develop and mature Enumeration Technology Tools, Testing Procedures and Technology deliverable process preparing for an expansion in FY 2024. The team plans to execute at a minimum 4 scans and will deliver Hull Mechanical and Electrical (HM&E) network maps.												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design		Project (Number/Name) 3244 / Cybersecurity Engineering		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
In FY 2023, this program will continue the integration of SABER on Navigation, Aviation, and Combat Enclaves for Afloat Platforms. In FY 2023, the program will increase Cybersecurity Vulnerability Assessment Tool's (CFAST) Assessment capability at current SECRET instance in support of executing assessments. User beta team will execute user test plan Cybersecurity Vulnerability Assessment Tool (CFAST) in Secret High-Performance Computing (S HPC) Environment with the intent of going Full Operational Capability (FOC) in quarter 4 of FY 2023. This will enable end users to self-service CFAST tool for unclassified systems. Beginning in FY 2023, the CFAST team will begin building software updates, then will be installed on a HPC container and delivered for installation. The team will deliver at a minimum two software updates in FY 2023.						
The program will identify infrastructure and security requirements for the Top-Secret High-Performance Computing (TS HPC) Environment in support of allowing self-service CFAST for classified systems. TS HPC will be at Interim Operational Capability (IOC) by Quarter 4. Increase CFAST Assessment capability in support of executing CFAST assessments at the TS level for classified systems. The CFAST program will research the development and integration of other domains beyond Cyber (Program Protection, SCRM) into the CFAST tool.						
USS SECURE will continue to develop and expand the Navy's enterprise solution for addressing cyber-Test & Evaluation policy and requirements. Cybersecurity requirements are increasing to mitigate emerging threats and policy documents such as DODI 5000.89 are directing all system owners to improve cyber resiliency; for example, system owners must now perform iterative Developmental Testing (DT) and Operational Testing (OT) testing throughout the systems lifecycle. Many legacy systems must now incorporate these new cyber requirements into their lifecycle operations and will soon be looking for test capabilities. USS SECURE will prepare for the increasing demand by planning for more tests per year and tailoring testing services to the size, complexity, frequency, and lifecycle stage of the systems involved. USS SECURE will accommodate new acquisitions by adapting processes to support the different Adaptive Acquisition Framework Pathways. USS SECURE will conduct four Cyber Risk Assessments in FY 2023 and emergent testing needs that cannot be accommodated during those three events will be scheduled separately.						
FY 2024 Base Plans: In FY 2024, SABER integration will expand to Navigation, Aviation, and Combat Enclaves for Afloat Platforms.						
SABER program will increase research, development, testing and evaluation necessary to support upcoming ship installs to additional platforms. This includes expanding collection architecture to provide capabilities to new platform types and different technologies under protection. In FY 2024, the program will complete						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design		Project (Number/Name) 3244 / Cybersecurity Engineering		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
annual updates to enumeration technology tools and signature maturity to support developing cyber threat requirements. Integration of Artificial Intelligence and Machine Learning methods and techniques will be ongoing in FY 2024.						
The program will enhance the cybersecurity capability by expanding the core SABER software while continuing periodic updates and will work with the Programs to ensure that configurations meet the need for advanced defensive cyber capabilities on afloat Navy platforms. As the Lead Cross-Platform Integration Manager, NAVSEA 03C will manages and lead the SABER Configuration Control Boards (CCB), continue to manage all non-recurring engineering, modifications, tailoring, and provide support to PEOs for continued deployment and life cycle maintenance. Software development, integration, maintenance, and lifecycle support will be provided for the 11 shipboard installations planned in FY24, and the 25 SABER systems currently being integrated on Shipboard.						
In FY 2024, this program will take on additional efforts previously conducted by PEO SHIPS to build of Hull, Mechanical, and Electrical (HM&E) cybersecurity computing hardware Lab units for NSWC Philadelphia Division, Philadelphia PA for ship integration testing to support installations in FY 2025 and FY 2026. FY24 efforts will evolve the design and development of second-generation Situational Boundary Enforcement & Response (SABER) Computing Hardware. This additional work will develop and test new Weasel Board variants as well as existing variants for additional ship classes.						
The efforts include the development of advanced surface ship Hull, Mechanical, and Electrical (HM&E) cyber security, which develops and tests various cyber security hardware that monitors the HM&E network and system communications to detect and deter potential cyber-attacks. HM&E cyber security hardware will transition to appropriate back-fit and forward fit ship installations, as appropriate, once development and testing completes.						
In FY 2024, this program continues transition of Cybersecurity Vulnerability Assessment Tool (CVAST) in the Top-Secret High-Performance Computing (TS HPC) Environment, which helps to scale the utilization for broader application across the Command. The program will install infrastructure to support TS communications, will maintain secret assessment capability and increase TS assessment capability. NAVSEA 03C will mature and validate the process by delivering software updates and conducting a beta test CVAST in (TS HPC) Environment with the intent of going Full Operational Capability (FOC) in Quarter 4 of FY 2024.						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603563N / <i>Ship Concept Advanced Design</i>		Project (Number/Name) 3244 / <i>Cybersecurity Engineering</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>In FY24, NAVSEA 03C will continue collaboration with Program Offices and designated Warfare Centers to conduct land-based end-to-end system cyber-security testing. NAVSEA 03C will continue to develop and integrate additional Cybersecurity capabilities into future USS SECURE test events. USS SECURE will continue to refine and develop test processes and methods in order to respond to increased demand and tailoring testing services based on system complexity and lifecycle stage. USS SECURE plans to conduct three Cyber Risk Assessments in FY 2024 and will conduct other emergent tests as needed.</p> <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> The increase of \$20.6M captures the full SABER HM&E requirement under one project (3244) and expands the team to provide technical software support to current fleet installations as well as core development for additional installations throughout the FYDP. The program's research and development will expand exponentially to ensure SABER is pacing the threat of Cyber to include incorporating Artificial Intelligence and Machine Learning (AI/ML), expanding the DevSecOps environment, incorporation of Enumeration Technology and expansion of Collection Architecture capabilities. The funding will be executed to existing partners at Field Activities, UARCs, Academia, and industry partners.</p>						
Accomplishments/Planned Programs Subtotals		14.914	15.509	36.117	0.000	36.117
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy This is a non-acquisition program that designs, develops, and tests Cybersecurity solutions and technologies in support of control systems and combat system enclaves for all afloat U.S. Navy platforms. The capabilities are transitioned to acquisition programs for installation and sustainment. This program sustains and expands the USS SECURE cybersecurity testing capability and infrastructure to ensure compliance with DoD and Navy Cybersecurity test and evaluation requirements in direct support of Navy acquisition programs.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design				Project (Number/Name) 3244 / Cybersecurity Engineering					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Cybersecurity Technologies	C/CPFF	JHU APL : Baltimore, MD	0.900	0.300	Oct 2021	0.300	Oct 2022	3.500	Oct 2023	-		3.500	Continuing	Continuing	Continuing
Cybersecurity Technologies	WR	NUWC Newport : Newport, RI	1.250	1.359	Oct 2021	1.400	Oct 2022	3.500	Oct 2023	-		3.500	Continuing	Continuing	Continuing
Cybersecurity Technologies	WR	NSWC DD : Dahlgren, VA	1.000	1.351	Oct 2021	1.400	Oct 2022	3.200	Oct 2023	-		3.200	Continuing	Continuing	Continuing
Cybersecurity Technologies	WR	NSWC PD : Philadelphia, PA	2.100	2.087	Oct 2021	2.200	Oct 2022	6.500	Oct 2023	-		6.500	Continuing	Continuing	Continuing
Cybersecurity Technologies	C/CPFF	Various Contractors : Various	1.200	0.625	Oct 2021	0.300	Oct 2022	1.777	Oct 2023	-		1.777	Continuing	Continuing	Continuing
Cybersecurity Technologies	MIPR	GSA : O'Fallon, IL	0.000	0.632	May 2022	0.700	May 2023	2.900	May 2024	-		2.900	Continuing	Continuing	Continuing
Subtotal			6.450	6.354		6.300		21.377		-		21.377	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NSWC CD : Carderock, MD	0.300	0.500	Oct 2021	0.500	Oct 2022	0.700	Oct 2023	-		0.700	Continuing	Continuing	Continuing
Program Management Support	WR	NIWC PAC : San Diego, CA	0.237	0.277	Oct 2021	0.280	Oct 2022	0.300	Oct 2023	-		0.300	Continuing	Continuing	Continuing
Program Management Support	C/CPFF	Various Contractors : Various	3.200	1.790	Jan 2022	0.200	Jan 2023	0.300	Oct 2023	-		0.300	Continuing	Continuing	Continuing
Program Management Support	MIPR	GSA : O'Fallon, IL	0.000	1.443	May 2022	2.079	May 2023	3.500	May 2024	-		3.500	Continuing	Continuing	Continuing
Program Management Support	MIPR	DTIC : Fort Belvoir, VA	0.000	0.000		2.000	Oct 2022	3.500	Oct 2023	-		3.500	Continuing	Continuing	Continuing
Subtotal			3.737	4.010		5.059		8.300		-		8.300	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design					Project (Number/Name) 3244 / Cybersecurity Engineering				
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NAWC CL : China Lake, CA	0.173	0.000	Oct 2021	0.000	Oct 2022	0.000		-		0.000	0.000	0.173	-
Developmental Test & Evaluation (DT&E)	WR	NSWC PD : Philadelphia, PA	0.090	0.000	Oct 2021	0.000	Oct 2022	0.000		-		0.000	0.000	0.090	-
Developmental Test & Evaluation (DT&E)	WR	NSWC CO : Corona, CA	0.830	1.200	Oct 2021	1.200	Oct 2022	1.300	Oct 2023	-		1.300	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NSWC DD : Dahlgren, VA	3.138	2.700	Oct 2021	2.700	Oct 2022	3.700	Oct 2023	-		3.700	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	MIPR	GSA : O'Fallon, IL	1.000	0.600	May 2022	0.150	May 2023	1.240	May 2024	-		1.240	Continuing	Continuing	Continuing
Subtotal			5.231	4.500		4.050		6.240		-		6.240	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
HQ PM Travel	Allot	NAVSEA HQ : Washington, DC	0.050	0.050	Oct 2021	0.100	Oct 2022	0.200	Oct 2023	-		0.200	Continuing	Continuing	Continuing
Subtotal			0.050	0.050		0.100		0.200		-		0.200	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			15.468	14.914		15.509		36.117		-		36.117	Continuing	Continuing	N/A
Remarks															

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PE 0603563N: *Ship Concept Advanced Design*
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R-1 Program Element (Number/Name)	Program Element Description	Program Element Status	Program Element Comments

PE 0603563N / Ship Concept Advanced Design

3244 / Cybersecurity Engineering

PE 0603563N: *Ship Concept Advanced Design* **UNCLASSIFIED** Page 35 of 73 R-1 Line #45 **Volume 2 - 403**

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603563N / Ship Concept Advanced Design

Project (Number/Name)

3244 / Cybersecurity Engineering

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3244				
SABER: Red Team Events	1	2022	3	2028
SABER: Automatic Test and Re-test Events	1	2022	4	2027
SABER: SABER Integration Testing	1	2022	2	2024
SABER: BDC testing	1	2022	2	2023
SABER: SABER Qualification SOP Updated & Signed	4	2022	4	2027
SABER: Core Development Team Development Offsite	1	2022	4	2028
SABER: SCT Qualification and Validation	1	2022	4	2028
SABER: SCT Baseline Release	2	2022	4	2028
SABER: Ruleset Maturity Group	1	2022	4	2028
SABER: BDC Characterization Efforts	2	2022	2	2027
SABER: HAVEN releases	1	2022	3	2027
SABER: Configuration Review Boards	1	2022	4	2028
SABER: Platform Installation Reviews	1	2022	4	2026
SABER: HM&E Platform baseline Mapped	2	2022	4	2028
SABER: Deploying CVAULT in HBC	3	2022	4	2023
SABER: Deploying CVAULT in the TS HBC	1	2024	4	2024
SABER: CVAULT Training Pipeline and Documentation	2	2023	2	2023
SABER: CVAULT Software Updates	1	2023	3	2028
SABER: Delivering the Software updates Container	1	2023	4	2028
USS SECURE: USS SECURE Quarterly Program Reviews	1	2022	4	2028
USS SECURE: USS SECURE CRA Events	1	2022	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced De sign				Project (Number/Name) 3376 / Strategic Sealift			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3376: Strategic Sealift	29.545	8.759	7.166	6.134	-	6.134	4.696	4.201	4.268	4.255	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 3376 - Strategic Sealift Research and Development - Develops new concepts and technologies which can be applied to or will enable future strategic sealift, and Seabasing systems. The technologies include ship configuration concepts, equipment to increase cargo handling and cargo loading/unloading rates (including commercial and merchant ship systems), improved man/machine interfaces, improved structural configurations and materials, and Logistics-Over-the-Shore (LOTS) equipment and system improvements.

Prior Years include: FY2016 and prior years (FY2014 and earlier) efforts financed under the National Defense Sealift Fund (NDSF) BA 04 Project 3116 Strategic Sealift Research and Development; FY2015, FY2017, FY2019 thru FY2022 efforts financed under this program element, RDT&E,N BA04, Project 3376 (Strategic Sealift); and FY2018 efforts financed under RDT&E,N BA 04 Project 9999/C403 (Congressional Adds).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Shipboard Crane Systems/Shipboard Cargo Systems	3.060	5.958	4.440	0.000	4.440
Articles:	-	-	-	-	-
FY 2023 Plans: Continue investigation and demonstration of shipboard crane/cargo system improvements including Vertical Launch System (VLS) Rearming and transfer capabilities. VLS rearming scope to include completion of fabrication and start of testing of intermodal container system for transportation of VLS missile canisters. Begin analysis and concept development for rearming of Naval Strike Missile. Begin analysis and concept development for T-AKE (dry cargo/ammunition ship) upgrades to enhance VLS and heavyweight torpedo rearming capabilities. Begin engineering design and development for VLS Strike Up/Strike Down System transition.					
FY 2024 Base Plans: Continue investigation and demonstration of shipboard crane/cargo system improvements including Vertical Launch System (VLS) Rearming and transfer capabilities. VLS rearming scope to include continuation of testing of intermodal container system for transportation of VLS missile canisters. Continue analysis and concept development for rearming of Naval Strike Missile. Continue concept development, and begin design and fabrication for T-AKE (dry cargo/ammunition ship) upgrades to enhance VLS and heavyweight torpedo rearming					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design		Project (Number/Name) 3376 / Strategic Sealift		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
capabilities. Continue engineering design and development and begin fabrication for VLS Strike Up/Strike Down System transition. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Budget decrease of \$1.518M reflects the schedule of the planned work for the T-AKE rearming project and VLS Strike Up/Strike Down system transition.						
Title: Sealift Concept Development Articles: FY 2023 Plans: Continue Sealift Research and Technology development and program guidance. Continue investigation of improved sealift vessel survivability. FY 2024 Base Plans: Continue Sealift Research and Technology development and program guidance. Continue investigation of improved sealift vessel survivability. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Budget increase of \$461K reflects an increased level of effort for developing projected survivability performance and concepts for survivability improvements.		2.170 -	0.673 -	1.134 -	0.000 -	1.134 -
Title: Lighter/HSV Seabase to Shore Cargo Transfer Articles: FY 2023 Plans: N/A FY 2024 Base Plans: Development of Unmanned Surface Vessels (USV) logistics delivery system FY 2024 OCO Plans:		2.966 -	0.000 -	0.560 -	0.000 -	0.560 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603563N / <i>Ship Concept Advanced Design</i>		Project (Number/Name) 3376 / <i>Strategic Sealift</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: Budget increase of \$560K reflects the continuation of the Logistics USV Unmanned Delivery System Concept Development project after a pause in FY 2023.						
Title: Advanced Tools		0.563	0.535	0.000	0.000	0.000
		-	-	-	-	-
FY 2023 Plans: Continue investigation and demonstration of individual and multi-ship motion measurement and prediction Environmental and Ship Motion Forecasting (ESMF) system to include installation and testing of the EPF 10.						
FY 2024 Base Plans: N/A						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: Budget decrease of \$535K reflects the completion of the Environmental and Ship Motion Forecasting (ESMF) project.						
Accomplishments/Planned Programs Subtotals		8.759	7.166	6.134	0.000	6.134
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
Not applicable for SEALIFT R&D efforts.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design					Project (Number/Name) 3376 / Strategic Sealift				
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Shipboard Crane Systems/ Shipboard Cargo Systems	WR	Various Contractors : Various	11.969	3.060	Jan 2022	5.958	Jan 2023	4.440	Jan 2024	-		4.440	Continuing	Continuing	Continuing
Sealift Concept Development	WR	Various Contractors : Various	6.327	2.170	Jan 2022	0.673	Jan 2023	1.134	Jan 2024	-		1.134	Continuing	Continuing	Continuing
Lighter/HSV Seabase to Shore Cargo Transfer	WR	Various Contractors : Various	7.376	2.966	Jan 2022	0.000		0.560	Jan 2024	-		0.560	Continuing	Continuing	Continuing
Advanced Tools	WR	Various : Various	3.873	0.563	Jan 2022	0.535	Jan 2023	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			29.545	8.759		7.166		6.134		-		6.134	Continuing	Continuing	N/A
Remarks															
1. Prior Years column only includes FY2015 and FY2017 (project 3376); FY2018 Congressional Add (project C403; and FY2019-FY2022 (project 3376) funding as FY2016 and prior years (FY14 and earlier) were funded under NDSF BA 04 Project 3116 Strategic Sealift Research and Development.															
2. Award dates reflect initial award of incremental execution.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			29.545	8.759		7.166		6.134		-		6.134	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

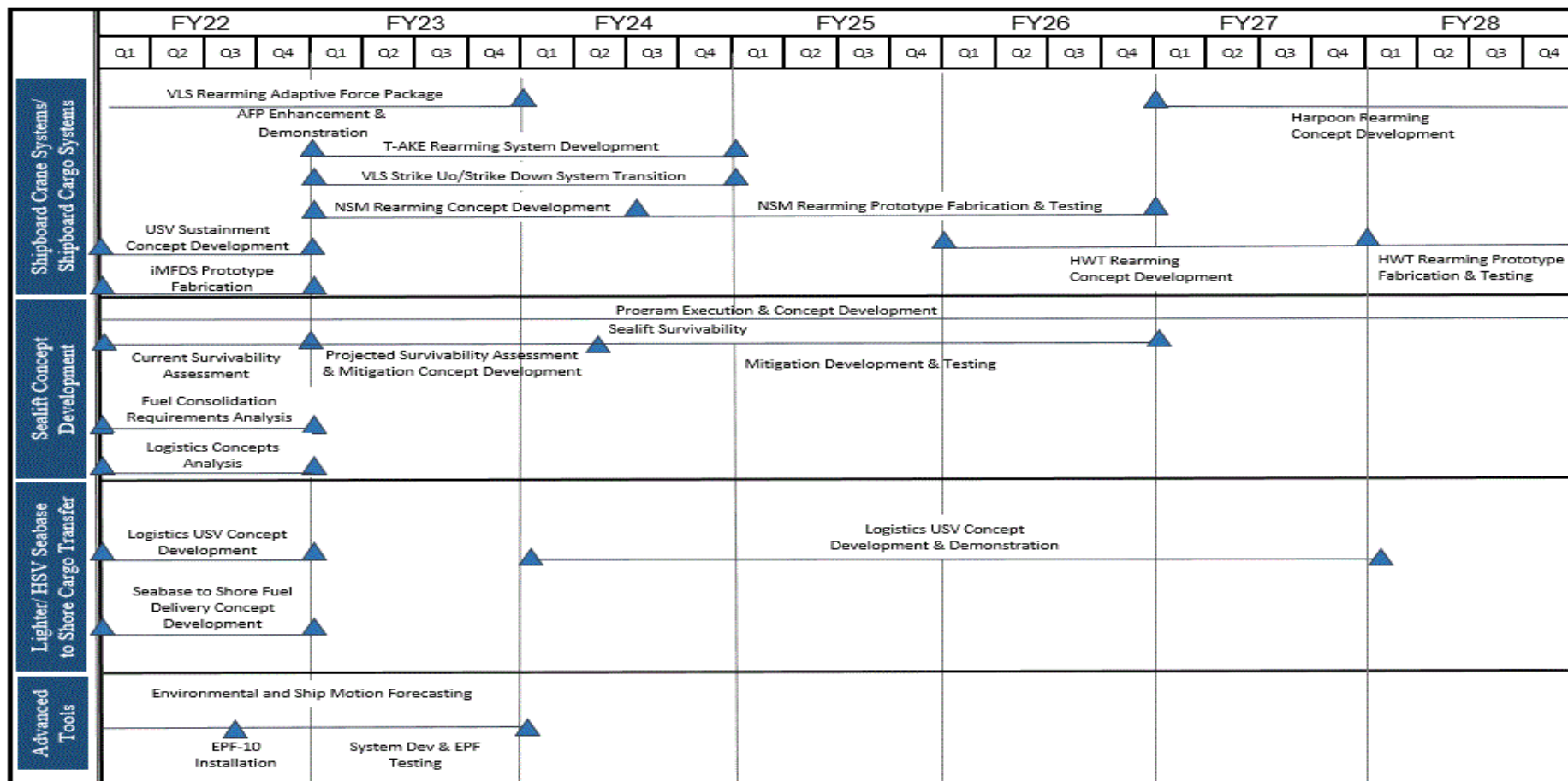
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R-1 Program Element (Number/Name)

PE 0603563N / Ship Concept Advanced Design

Project (Number/Name)

3376 / Strategic Sealift



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design	Project (Number/Name) 3376 / Strategic Sealift	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3376				
Shipboard Crane Systems/Shipboard Cargo Systems	1	2022	4	2028
Sealift Concept Development	1	2022	4	2028
Lighter/HSV Seabase to Shore Cargo Transfer	1	2022	4	2022
Lighter/HSV Seabase to Shore Cargo Transfer FY24-FY28	1	2024	1	2028
Advanced Tools	1	2022	1	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design				Project (Number/Name) 3505 / Maritime Prepositioning Force Next			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3505: Maritime Prepositioning Force Next	0.000	0.000	0.000	1.502	-	1.502	1.503	2.539	16.485	2.485	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Note This project is a new start in FY 2024.												
A. Mission Description and Budget Item Justification The MPF(X) ships will recapitalize the aging BOBO Class maritime prepositioning ships. The 'Sealift the Nation Needs' report to Congress defines a three-phase Sealift Recapitalization approach: Service Life Extensions, Acquiring Used ships, and new construction. The MPF(X) portion represents the prepositioning new construction aspect of the three-phase sealift recapitalization approach. USNS BOBO class ships will retire from service beginning in FY 2033. Approval of an Initial Capabilities Document (ICD), and the early efforts of an Analysis of Alternatives (AoA) are planned beginning in FY2024.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Maritime Prepositioning Force Next Design and Integration Articles: FY 2023 Plans: N/A FY 2024 Base Plans: FY 2024 funds will be used to fund development and approval of an Initial Capabilities Document (ICD). ICD efforts will include identification of applicable gaps associated with operational risk across the joint force that the MPF(X) program is intended to fill, and proposal of materiel and/or non-materiel approaches that will be further studied in the Analysis of Alternatives (AoA). Early pre-AoA efforts to be completed by Warfare Centers and various Support Contractors are planned to begin in late FY 2024. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: MPF(X) Program Initiation efforts will begin in FY 2024.								0.000	0.000	1.502	0.000	1.502
								-	-	-	-	-
Accomplishments/Planned Programs Subtotals								0.000	0.000	1.502	0.000	1.502

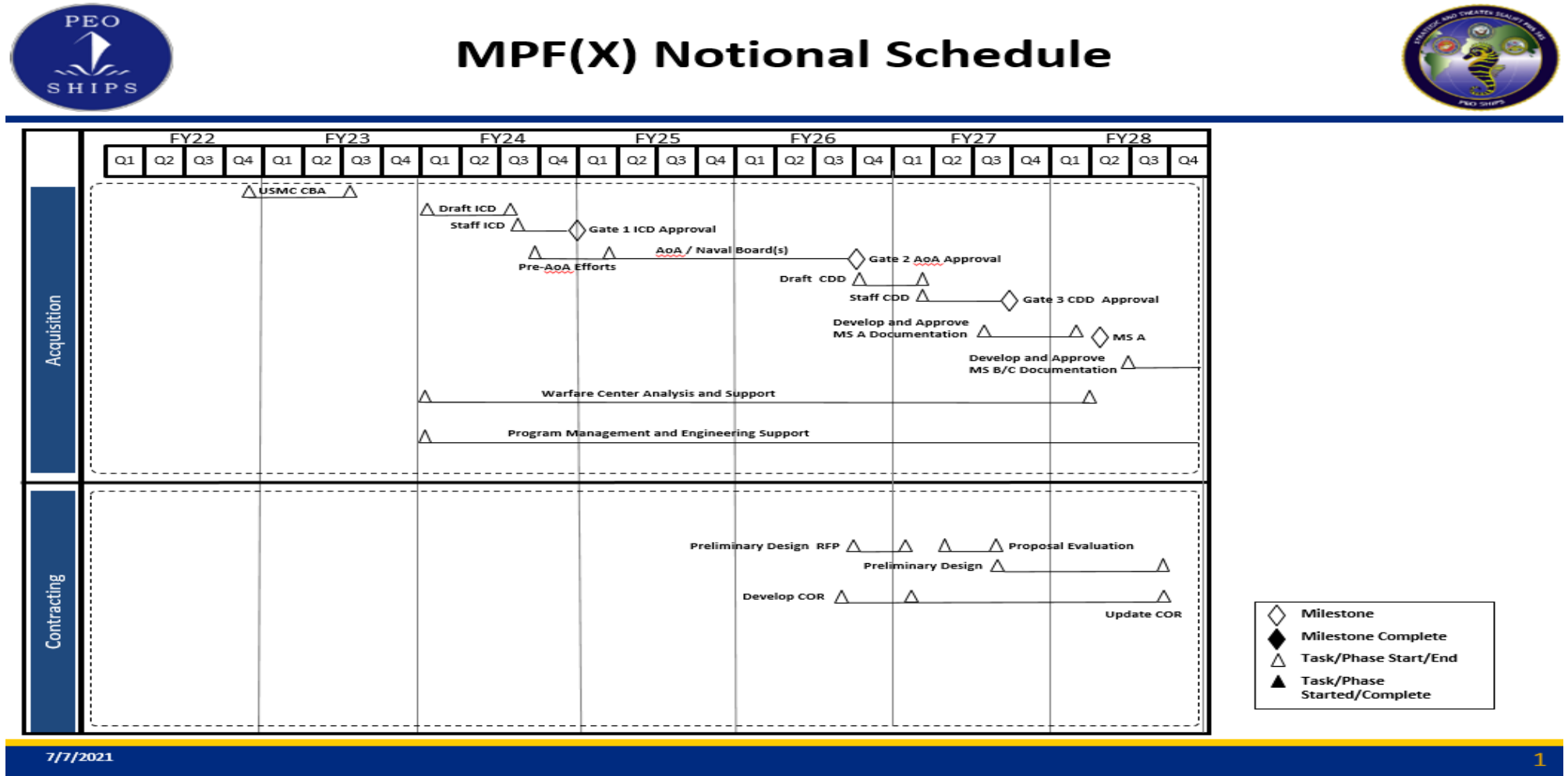
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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design	Project (Number/Name) 3505 / Maritime Prepositioning Force Next
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy Preliminary Design is contemplated to be completed by multiple industry partners. The acquisition strategy for the Detail Design & Construction efforts will be developed in the future.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023					
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design						Project (Number/Name) 3505 / Maritime Prepositioning Force Next					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total					
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract		
Initial Capability Document (ICD)	C/BA	Various : Various	0.000	0.000		0.000		0.500	Oct 2023	-		0.500	0.000	0.500	-		
Subtotal			0.000	0.000		0.000		0.500		-		0.500	0.000	0.500	N/A		
Remarks																	
1. Award dates reflect initial award of incremental execution.																	
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total					
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract		
PM & Engineering Support	C/BA	Variou : Various	0.000	0.000		0.000		0.301	Oct 2023	-		0.301	Continuing	Continuing	Continuing		
Warfare Center Analysis and Support	C/BA	Various : Various	0.000	0.000		0.000		0.701	Oct 2023	-		0.701	Continuing	Continuing	Continuing		
Subtotal			0.000	0.000		0.000		1.002		-		1.002	Continuing	Continuing	N/A		
Remarks																	
1. Award dates reflect initial award of incremental execution.																	
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals			0.000	0.000		0.000		1.502		-		1.502	Continuing	Continuing	N/A		
Remarks																	

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design		Project (Number/Name) 3505 / Maritime Prepositioning Force Next	



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design	Project (Number/Name) 3505 / Maritime Prepositioning Force Next	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3505				
Draft ICD	1	2024	4	2024
Gate 1 ICD Approval	4	2024	4	2024
AoA	3	2024	4	2026
Gate 2 AoA Approval	4	2026	4	2026
CDD Development	3	2026	3	2027
Gate 3 CDD Approval	3	2027	3	2027
MS A	2	2028	2	2028
Preliminary Design	3	2027	3	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design				Project (Number/Name) 4044 / Medium Landing Ship			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
4044: Medium Landing Ship	20.030	12.667	12.167	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	44.864
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Note												
Starting in FY2024, RDT&E requirements are detailed in PE 0603564N/Ship Preliminary Design & Feasibility Studies. PE changed to better align with scope of work for the program. Project Title updated from Next Generation Medium Amphibious Ship to Medium Landing Ship.												
A. Mission Description and Budget Item Justification												
The Light Amphibious Warship (LAW) will be referred to as the Medium Landing Ship (LSM) going forward to align with the mission and distinguish between traditional amphibious ships. LSM is a medium-sized landing ship that enables distributed maneuver and logistics such as Distributed Maritime Operations (DMO), Littoral Operations in a Contested Environment (LOCE), and Expeditionary Advanced Base Operations (EABO) in support of the newly established Marine Littoral Regiment (MLR). It is designed to fill the gap in capability between the Navy's large, multipurpose amphibious warfare class ships and smaller landing vessels. This ship will deploy tailored logistics, select power projection and strike capabilities.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Medium Landing Ship Articles: FY 2023 Plans: Following the conclusion of PD, the program will utilize the Special Studies Options under the previously awarded contracts with the five industry partners to conduct sensitivity analysis and mature the designs to help inform the Request for Proposal (RFP) for Detail Design and Construction (DD&C). FY2023 efforts will focus on maturing the circular of requirements and development of the Command, Control, Communications, Computers, and Intelligence (C4I) systems and shipboard network. Continue Government Furnished Equipment (GFE) development efforts to ensure full ship integration. Tasks include Engineering, Logistics, Program Management, and Test and Evaluation support. Engineering efforts in FY2023 develop the technical documentation required for the Navy's Gate Program Reviews. Logistics tasks continue in training development, informal Integrated Logistics Assessment (ILA) execution, advance planning for Homeport 1, operations and sustainment cost modeling development, and analysis for reliability, availability, and maintainability of the ship. Development and submission of Preliminary Ship's								12.667	12.167	0.000	0.000	0.000
								-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603563N / <i>Ship Concept Advanced Design</i>		Project (Number/Name) 4044 / <i>Medium Landing Ship</i>	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Manning Document (PSMD) and Manpower Estimate Report (MER). Program Management support continues for development of the statutory and regulatory required program Milestone documentation to support upcoming Navy Gate Program Reviews as well as the development of the DD&C RFP.</p> <p>Test and Evaluation support continues the development of the Test and Evaluation Master Plan (TEMP) and participation in Marine Corps Warfighting Lab (MCWL) Offshore Support Vessel experimentation efforts to reduce risk and prove out the concept of employment.</p> <p><i>FY 2024 Base Plans:</i> FY2024 Plans aligned under PE 0603564N, Ship Preliminary Design and Feasibility Studies to better align with the scope of the program.</p> <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Decrease of \$12.167M from FY2023 to FY2024 is due to FY2024 RDT&E requirements being moved PE 0603564N/Ship Preliminary Design & Feasibility Studies.</p>					
Accomplishments/Planned Programs Subtotals	12.667	12.167	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• 3050: <i>Medium Landing Ship</i>	0.000	0.000	0.000	-	0.000	187.928	150.144	297.024	296.196	0.000	931.292
• 0603564N: <i>Medium Landing Ship</i>	0.000	0.000	14.749	-	14.749	7.500	6.978	7.074	7.215	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Navy awarded the Concept Study /Preliminary Design contracts on 14 June 2021. Concept Studies completed in October 2021 and Preliminary Design options were exercised January 2022. The Detail Design and Construction award is planned for FY2025. This will allow the program to continue maturation of the design.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design				Project (Number/Name) 4044 / Medium Landing Ship					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Concept Studies/ Preliminary Design/ Sensitivity Analysis	TBD	Various : Various	12.194	6.693	Jan 2022	1.607	Dec 2022	0.000		-		0.000	0.000	20.494	Continuing
Subtotal			12.194	6.693		1.607		0.000		-		0.000	0.000	20.494	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	TBD	Various : Various	4.947	1.897	Nov 2021	8.042	Nov 2022	0.000		-		0.000	0.000	14.886	Continuing
Logistics Support	TBD	Various : Various	1.874	3.106	Nov 2021	0.292	Nov 2022	0.000		-		0.000	0.000	5.272	Continuing
Program Mgmt Support	TBD	Various : Various	0.507	0.757	Nov 2021	1.255	Nov 2022	0.000		-		0.000	0.000	2.519	Continuing
Subtotal			7.328	5.760		9.589		0.000		-		0.000	0.000	22.677	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	TBD	Various : Various	0.508	0.214	Nov 2021	0.971	Dec 2022	0.000		-		0.000	0.000	1.693	Continuing
Subtotal			0.508	0.214		0.971		0.000		-		0.000	0.000	1.693	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			20.030	12.667		12.167		0.000		-		0.000	0.000	44.864	N/A
Remarks															

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PE 0603563N: *Ship Concept Advanced Design*
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R-1 Program Element (Number/Name)
PE 0603563N / *Ship Concept Advanced Design*

Project (Number/Name)	4044 / <i>Medium Landing Ship</i>
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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design	Project (Number/Name) 4044 / Medium Landing Ship	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 4044				
Capability Development Document	1	2022	3	2023
Analysis of Alternatives Sufficiency Review	2	2022	2	2023
Gate 2	2	2022	2	2022
Preliminary Design	2	2022	4	2022
Gate 3	2	2023	3	2023
Gate 4/5	3	2023	4	2023
Combined Milestone B/C	1	2025	1	2025
Detail Design & Construction Award	2	2025	2	2025
Start of Construction for Lead Ship	3	2026	3	2026

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design				Project (Number/Name) 4045 / Next Generation Medium Logistics Ship			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
4045: Next Generation Medium Logistics Ship	19.978	20.384	2.959	8.810	-	8.810	7.737	2.149	1.472	1.855	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Next Generation Logistics Ship (NGLS) is planned to be a new class of ships to augment the traditional Combat Logistics Force (CLF) to enable refueling, rearming, and resupply of Naval assets - afloat and ashore - near contested environments via ship-to-ship operations and ship-to port operations in support of Distributed Maritime Operations (DMO), Littoral Operations in a Contested Environment (LOCE), and Expeditionary Advanced Base Operations (EABO). Augmenting the traditional CLF, NGLS will provide a flexible, responsive platform to move fuel, personnel, equipment, and supplies between ships, advanced bases, ports, and dispersed nodes of the seabase; sustaining afloat (Surface Action Group) and ashore (Expeditionary Advanced Base) requirements. RDT&E funding will continue to support development of the NGLS ship design(s), specification development, affordability analyses, and definition of ship mission systems leading to Detail Design & Construction award of the lead ship in FY 2026.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Next Generation Logistics Ship	20.384	2.959	8.810	0.000	8.810
Articles:	-	-	-	-	-
FY 2023 Plans: FY 2023 funds will be used to support the AoA efforts and design maturation, and release of the Preliminary Design Request for Proposals (RFP).					
FY 2024 Base Plans: FY 2024 funds will be used to support the award of Preliminary Design contracts, finalizing the CDD, development of the Test Evaluation Management Plan (TEMP) and execution of Program Management and Engineering Support efforts. Award Preliminary Design contracts.					
FY 2024 OCO Plans: N/A					
FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$5.851 million is primarily due to the award of Preliminary Design contracts, along with development of the NGLS Test and Evaluation Master Plan (TEMP).					
Accomplishments/Planned Programs Subtotals	20.384	2.959	8.810	0.000	8.810

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design	Project (Number/Name) 4045 / Next Generation Medium Logistics Ship
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy Preliminary Design efforts will be performed by several industry partners. The acquisition strategy for the future Detail Design & Construction efforts will be developed during FY 2024.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design				Project (Number/Name) 4045 / Next Generation Medium Logistics Ship					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Industry Studies & Design	Various	Various : Various	6.000	2.500	Sep 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Preliminary Design	Various	Various : Various	0.000	0.000		0.000		4.000	Dec 2023	-		4.000	0.000	4.000	-
Indicative Design	C/BA	NSWC CD : Maryland	2.500	2.500	May 2022	0.500	May 2023	0.000		-		0.000	0.000	5.500	-
Vessel Experimentation and Demonstration	C/BA	Various : Various	4.650	7.187	Sep 2022	0.000		0.000		-		0.000	0.000	11.837	-
Subtotal			13.150	12.187		0.500		4.000		-		4.000	Continuing	Continuing	N/A
Remarks															
Due to AoA delays, Preliminary Design contract awards have moved from August 2023 to December 2023.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PM & Engineering Support	C/BA	CACI : Virginia	2.860	1.769	May 2022	1.119	Mar 2023	3.000	Jan 2024	-		3.000	Continuing	Continuing	Continuing
Special Studies	C/BA	Various : Not Specified	1.565	0.000		0.000		0.000		-		0.000	0.000	1.565	-
Warfare Center Analysis and Support	C/BA	Various WFC : Various WFC	1.378	1.581	May 2022	0.840	Mar 2023	0.000		-		0.000	0.000	3.799	-
AoA Support	C/BA	CACI/Systems Planning & Analysis : Virginia	1.025	4.847	May 2022	0.500	Apr 2023	0.000		-		0.000	0.000	6.372	-
Subtotal			6.828	8.197		2.459		3.000		-		3.000	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	C/BA	Various : Various	0.000	0.000		0.000		1.810	Jan 2024	-		1.810	0.000	1.810	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design				Project (Number/Name) 4045 / Next Generation Medium Logistics Ship					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			0.000	0.000		0.000		1.810		-		1.810	0.000	1.810	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			19.978	20.384		2.959		8.810		-		8.810	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																Date: March 2023			
Appropriation/Budget Activity 1319 / 4								R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design								Project (Number/Name) 4045 / Next Generation Medium Logistics Ship			

Proj 4045	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
	USG Indicative Design																											
	Warfare Center Analysis and Support																											
	PM & Engineering Support																											
	Industry Studies & Design																											
	Special Studies																											
	Vessel Experimentation/ Demonstration / Proof of Concept																											
	Analysis of Alternatives																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603563N / <i>Ship Concept Advanced Design</i>	Project (Number/Name) 4045 / <i>Next Generation Medium Logistics Ship</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 4045				
USG Indicative Design	1	2022	2	2022
Warfare Center Analysis and Support	1	2022	4	2026
Program Management & Engineering Support	1	2022	4	2026
Industry Studies & Design	1	2022	3	2023
Special Studies	1	2022	3	2023
Vessel Experimentation/ Demonstration / Proof of Concept	1	2022	1	2023
Analysis of Alternatives	1	2022	3	2023
Release Preliminary Design Request for Proposal (RFP)	4	2023	4	2023
Preliminary Design	4	2023	2	2025
Detail Design	1	2026	4	2028
Test and Evaluation Master Plan (TEMP)	3	2024	3	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design				Project (Number/Name) 5010 / AS(X) Submarine Tender			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
5010: AS(X) Submarine Tender	0.000	15.781	15.466	10.565	-	10.565	5.050	4.028	0.000	0.000	0.000	50.890
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
AS(X) will conduct steady state and wartime sustained, forward-based tending, resupply, depot and intermediate level repair operations on submarines and ships while anchored or pier side. In steady state, AS(X) will provide pier side support in a forward deployed submarine homeport, providing sustained repair, supply, weapons handling, and tending operations for submarines.												
AS(X) is being specifically designed to support deployed VIRGINIA class (VCS), COLUMBIA class (CLB) and future generation submarines in the 21st century. AS(X) is required to support all aspects of Intermediate level maintenance and support to deliver expeditionary tending operations to VCS block V (and later) submarines.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: AS(X) Submarine Tender Design and Total Ship Integration Articles:								15.781	15.466	10.565	0.000	10.565
								-	-	-	-	-
FY 2023 Plans: Continue AS(X) Program development efforts, including exercising the Design Maturation option CLIN on PD contract and continued development of acquisition documentation to support Gate 4/5 and Milestone B/ C including: Reliability, Availability, Maintainability, Cost (RAM-C) Rationale Report, Program Protection Plan (PPP) with Cybersecurity Strategy, Life Cycle Sustainment Plan (LCSP), Diminishing Manufacturing Plan (DMP), Item Unique Identification (IUID) Plan, Core Logistics Determination, Systems Engineering Plan (SEP), Information Support Plan (ISP), Navy Training Systems Plan (NTSP), Preliminary Ships Manning Document (PMSD), System Safety Management Plan, Programmatic Environmental Safety and Occupational Health Evaluation (PESHE), Cost Position, Design Reviews, and more. Additional efforts include the development of the AS(X) System Specification, with the Nuclear Support Facility (NSF) Specification included, and DD&C RFP development efforts supporting release of the AS(X) DD&C RFP.												
FY 2024 Base Plans: FY24 will continue with AS(X) Program development efforts including continued development and refinement of acquisition documentation to support Milestone B/C. Additional efforts include award of the DD&C Contract as well as establishment of the Government oversight team.												
FY 2024 OCO Plans:												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603563N / <i>Ship Concept Advanced Design</i>		Project (Number/Name) 5010 / <i>AS(X) Submarine Tender</i>	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A					
<i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Budget decrease of \$4.901M reflects planned AS(X) DD&C Award and Receipt of FY 2024 SCN funds.					
Accomplishments/Planned Programs Subtotals	15.781	15.466	10.565	0.000	10.565
C. Other Program Funding Summary (\$ in Millions) N/A					
Remarks					
D. Acquisition Strategy The AS(X) Program pursued full and open competition to award three Preliminary Design Contracts, and is using a streamlined tailored acquisition approach with Acquisition Category (ACAT) II designation with tailoring of acquisition required documentation to support the FY 2022-2023 PD contract and FY 2023 Acquisition Documentation, Detail Design and Construction (DD&C) RFP and specification development based on PD. The program will be a single step to full capability, competitive contract, recapitalizing the existing 2 Submarine Tenders, and not an incremental procurement. AS(X) source selection, Preliminary Design contracts in FY 2022-2023 will aid in the development and finalization of the ship specification, Nuclear Support Facility (NSF) Interface Control Document (which will then be used to finalize the NSF specification), ship cost estimate, and detailed design and ship construction schedule. FY 2023 will focus on the DD&C contract solicitation and integrated Future Afloat Logistics Force (FALF) support for force logistics function of the sub tender.					

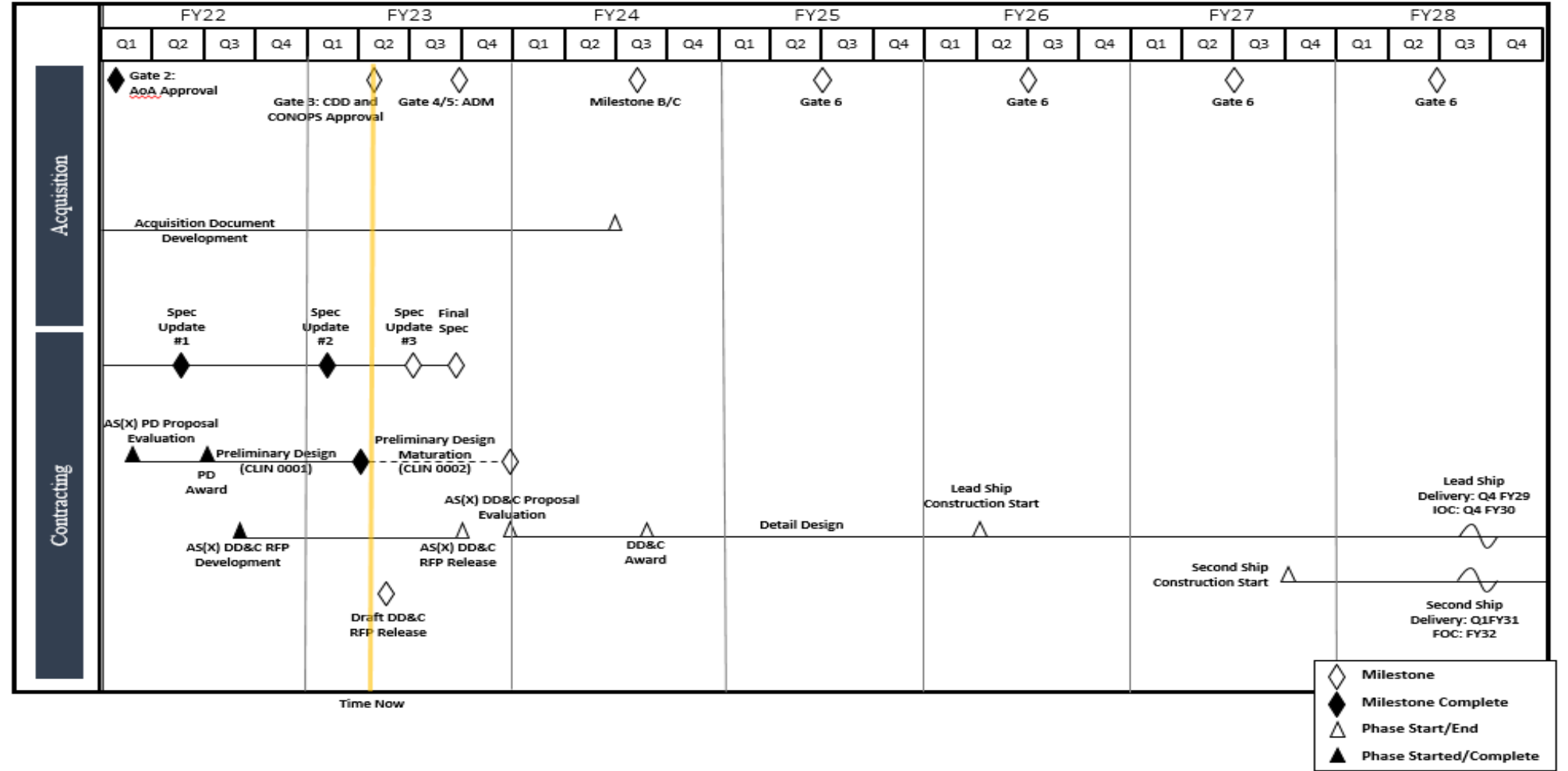
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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design					Project (Number/Name) 5010 / AS(X) Submarine Tender				
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Submarine Tender Design Maturation (PD)	Various	Various : Various	0.000	9.000	Apr 2022	9.000	Jan 2023	0.000		-		0.000	0.000	18.000	-
Subtotal			0.000	9.000		9.000		0.000		-		0.000	0.000	18.000	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program and Engineering Support	Various	Various : Various	0.000	2.600	Jan 2022	3.600	Jan 2023	5.737	Jan 2024	-		5.737	0.000	11.937	-
Subtotal			0.000	2.600		3.600		5.737		-		5.737	0.000	11.937	N/A
Remarks															
1. Award dates reflect initial award of incremental execution.															
2. \$2.1M increase from FY 2023 to FY 2024 is to support evaluation and award of DD&C Contract and establishment of Government oversight team.															
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	Various	Various : Various	0.000	0.090	Jan 2022	0.030	Jan 2023	0.248	Jan 2024	-		0.248	0.000	0.368	-
Subtotal			0.000	0.090		0.030		0.248		-		0.248	0.000	0.368	N/A
Remarks															
1. Award dates reflect initial award of incremental execution.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023				
Appropriation/Budget Activity						R-1 Program Element (Number/Name)					Project (Number/Name)					
1319 / 4						PE 0603563N / Ship Concept Advanced Design					5010 / AS(X) Submarine Tender					
Management Services (\$ in Millions)						FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total		
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Acquisition Document Development	Various	Various : Various	0.000	4.091	Jan 2022	2.836	Jan 2023	4.580	Jan 2024	-		4.580	0.000	11.507	-	
Subtotal			0.000	4.091		2.836		4.580		-		4.580	0.000	11.507	N/A	
Remarks																
1. Award dates reflect initial award of incremental execution.																
2. \$1.7M increase from FY 2023 to FY 2024 is to support documentation development to support Milestone B/C and DD&C Award.																
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals			0.000	15.781		15.466		10.565		-		10.565	0.000	41.812	N/A	
Remarks																

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy															Date: March 2023				
Appropriation/Budget Activity 1319 / 4										R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design					Project (Number/Name) 5010 / AS(X) Submarine Tender				



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design	Project (Number/Name) 5010 / AS(X) Submarine Tender	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 5010				
Submarine Tender and NSF Specification Development	1	2022	3	2023
Submarine Tender Acquisition Documentation	1	2022	3	2024
Preliminary Design Award	3	2022	3	2022
Submarine Tender DD&C RFP Development	3	2022	3	2023
CDD and CONOPS Approval	4	2022	4	2022
Submarine Tender Preliminary Design Maturation/Special Studies	3	2022	1	2024
Submarine Tender DD&C RFP Release	3	2023	3	2023
Award DDC contract	3	2024	3	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced De sign				Project (Number/Name) 9999 / Congressional Adds			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: Congressional Adds	43.413	30.871	48.200	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	122.484
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project C545 - Marine Energy Systems for Sensors and Microgrids

Funding provided in the Department of Defense Appropriations Act, 2023. Funding will continue maturation of Polymorphic Build Farms (PBFs) for distribution of polymorphic operating systems for DoD use. This includes the engineering, set up, delivery, implementation, and support for GovCloud PBFs. The build farm includes technologies such as the Point in Time Cache that allows for faithful and accurate builds of operating systems, both current and legacy/end-of-life. This includes the ability to lock down a specific version and configuration if needed for compliance/accreditation etc. The PBF will provide complete, end-to-end source code with the ability to create and update those operating systems as needed. The build out of PBFs facilitates the critical distribution of software to the fleet by providing scalability, redundancy and ensures availability of resources.

Project C580 - High-pressure Cold Spray System

Funding provided in the Department of Defense Appropriations Act, 2022. Funding will be applied to conduct research, development, and prototyping for high-pressure cold spray systems. Sustainment drives significant lifecycle costs to ships and submarines. The utilization of high-pressure cold spray systems for ship and submarine sustainment, including maintenance and repairs can result in significant efficiencies and cost savings for the Navy.

Project C602 - Defense Industrial Skills and Technology Training

Funding provided in the Department of Defense Appropriations Act, 2023. The Defense Industrial Skills and Technology Training (DISTT) program focuses on forging a next generation industrial workforce to improve the resiliency, lethality and availability of defense assets.

Work includes: Increasing expertise to improve operational efficiency; modernization and alignment of traditional trade work and work settings to meet operational mission requirements; and synergy between organic and defense industry partners to improve national industrial efficiencies resulting in faster fielding of new capabilities at scale

Project C634 - Polymorphic Build Farm for Open-Source Technologies

Funding provided in the Department of Defense Appropriations Act, 2022. Funding will establish two Polymorphic Build Farms (PBFs) for distribution of polymorphic operating systems for NAVSEA use. This includes the engineering, set up, delivery, implementation, and support for 2 GovCloud PBFs. The build farm includes technologies such as the Point in Time Cache that allows for faithful and accurate builds of operating systems, both current and legacy/end-of-life. This includes the ability to lock down a specific version and configuration if needed for compliance/accreditation etc. This project will adapt Polyverse's PBF technologies to the unique environments needed by NAVSEA. The PBF will provide complete, end-to-end source code with the ability to create and update those operating systems as needed. The build out of 2 PBFs facilitates the critical distribution of software to the fleet by providing scalability, redundancy and ensures availability of resources.

Project C752 - Metallic Additive Manufacturing

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603563N / <i>Ship Concept Advanced Design</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>
<p>Funding provided in the Department of Defense Appropriations Act, 2022 and 2023. Funding will support additive manufacturing of metal parts using 3D printers, which are used to support the needs of the U.S. Navy Fleet.</p> <p>Project C753 - Critical Protection Technology for Cybersecurity Engineering Funding provided in the Department of Defense Appropriations Act, 2022 and 2023. Funding will support programs with a controlled resilient supply chain Anti-Tamper solution that enhances current cybersecurity protection measures and provides a value-added extension to the technologies at the enclave core.</p> <p>Project C871 - Digital Maintenance Advisor for Shipboard Readiness Funding provided in the Department of Defense Appropriations Act, 2023. Funding enables Naval Sea Systems Command (NAVSEA) to demonstrate the "Digital Maintenance Advisor" artificial intelligence platform that analyzes data on the maintenance and health of shipboard assets in the Navy, improving military readiness, predicting and diagnosing issues before they occur, and lowering maintenance costs.</p>		
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023
Congressional Add: Marine energy systems for sensors and microgrids FY 2022 Accomplishments: N/A FY 2023 Plans: Continue maturation of software and hosting environment foundation to harden operating systems for cybersecurity resiliency to defend against sophisticated threats including nation state actors. Continue to develop and deploy technologies that enhance comprehensive platform cybersecurity capabilities. Continue exploration for hardening defense weapon systems for cybersecurity resiliency. Explore programs across Department of Navy for early adoption, e.g., Situational Awareness, Boundary Enforcement and Response (SABER) and Integrated Combat Systems.	0.000	15.000
Congressional Add: High pressure cold spray system FY 2022 Accomplishments: The High-Pressure Cold Spray Systems Congressional Add will conduct research, development, and prototyping for high-pressure cold spray systems. Sustainment drives significant lifecycle costs to ships and submarines. The utilization of high-pressure cold spray systems for ship and submarine sustainment, including maintenance and repairs, can result in significant efficiencies and cost savings for the Navy. FY 2023 Plans: N/A	9.647	0.000
Congressional Add: Defense industrial Skills and Technology Training	0.000	10.000

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603563N / <i>Ship Concept Advanced Design</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023
FY 2022 Accomplishments: N/A		
FY 2023 Plans: FY 2023 Plans Develop tools, actions and tactics to understand the gaps between current and required future state. Validate observations through interactive fielding exercises, to learn, adjust and then establish requirements for DISTT that can be scaled.		
Congressional Add: Polymorphic Build Farm for Open Source Technologies	9.647	0.000
FY 2022 Accomplishments: Transition both Commercial instances of the PBF into the IL5 and IL6 NAVSEA Cloud environment. Mature the DevSecOp PBF environment to include Polyscripting, MANTID and VIRSEC Software packages.		
FY 2023 Plans: Establish SABER/HAVEN as the first Software inherited into the DevSecOp process to develop the Zero Trust process.		
Congressional Add: Metallic additive manufacturing	4.824	4.000
FY 2022 Accomplishments: Additive manufacturing of metal parts using 3D printers, which are used to support the needs of the U.S. Navy Fleet.		
FY 2023 Plans: AM efforts will focus on the development of advanced designs for valves and air elements for submarine applications. Efforts will also focus on qualification of vendors to additively manufacture parts for Navy to expand the defense industrial base.		
Congressional Add: Critical protection technology for cybersecurity engineering	6.753	11.700
FY 2022 Accomplishments: Conduct Non-recurring Engineering (NRE) in support of Software and hardware development of Keystone for Preliminary Design Reviews (PDR) and Critical Design Reviews (CDR).		
FY 2023 Plans: Complete Non-recurring Engineering (NRE) for Preliminary Design Reviews (PDR) and Critical Design Reviews (CDR). Deliver PDR and CDR packages. Complete software/hardware demonstrations and deliver Demonstration Report. Start Test and Evaluation (T&E) of Keystone.		
Congressional Add: Digital maintenance advisor for shipboard readiness	0.000	7.500
FY 2022 Accomplishments: N/A		
FY 2023 Plans: To research, develop, test, and demonstrate the "Digital Maintenance Advisor" artificial intelligence platform that analyzes data on the maintenance and health of shipboard assets in the Navy,		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design	Project (Number/Name) 9999 / Congressional Adds	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023
improving military readiness, predicting and diagnosing issues before they occur, and lowering maintenance costs.			
Congressional Adds Subtotals		30.871	48.200
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design				Project (Number/Name) 9999 / Congressional Adds					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Manufacturing of Critical Scale Materials	TBD	Various : Various	0.988	0.000		0.000		0.000		-		0.000	0.000	0.988	-
Battery Prototype	TBD	Various : Various	1.482	0.000		0.000		0.000		-		0.000	0.000	1.482	-
C602 Defense Inudstrial Skills	MIPR	Various : Various	7.400	0.000		7.000	Jun 2023	0.000		-		0.000	0.000	14.400	-
C439 Additive Manufacturing (AM)	MIPR	AFRL : WPAFB, OH	2.980	0.000		0.000		0.000		-		0.000	0.000	2.980	-
C439 Additive Manufacturing (AM)	WR	NSWC CD : Bethesda, MD	1.820	0.000		0.000		0.000		-		0.000	0.000	1.820	-
C439 Additive Manufacturing (AM)	WR	NSWC : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
C439 Additive Manufacturing (AM)	C/CPFF	Contracts : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
C580 - Cold Spray	MIPR	ARMY : Various	1.342	1.500	Jun 2023	0.000		0.000		-		0.000	0.000	2.842	-
C752 - Metallic Additive Manufacturing (AM)	MIPR	AFRL : WPAFB, OH	0.000	2.538	Sep 2022	2.000	Sep 2024	0.000		-		0.000	0.000	4.538	-
C634 - Polymorphic Build Farms	MIPR	GSA : Various	0.000	8.000	May 2022	0.000		0.000		-		0.000	0.000	8.000	-
C753 - Critical Protection Technology	MIPR	GSA : Various	0.000	5.000	May 2022	10.530	May 2023	0.000		-		0.000	0.000	15.530	-
C752 - Metallic Additive Manufacturing (AM)	WR	NSWC CD : Bethesda, MD	0.000	1.562	Aug 2022	1.500	Sep 2024	0.000		-		0.000	0.000	3.062	-
C545 - Marine Energy Systems for Sensors and Microgrids	MIPR	GSA : Various	0.000	0.000		10.500	May 2023	0.000		-		0.000	0.000	10.500	-
C545 - Marine Energy Systems for Sensors and Microgrids	WR	NSWC DD : Virginia	0.000	0.000		3.000	May 2023	0.000		-		0.000	0.000	3.000	-
C871 - Digital Maintenance Advisor for Shipboard Readiness	Various	Various : Various	0.000	0.000		7.500	Sep 2024	0.000		-		0.000	0.000	7.500	-
Subtotal			16.012	18.600		42.030		0.000		-		0.000	0.000	76.642	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design					Project (Number/Name) 9999 / Congressional Adds				
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
C602 - Program Management Support	WR	Various : Various	0.494	0.000		1.000	Sep 2023	0.000		-		0.000	0.000	1.494	-
C580 - Program Mgmt Support	TBD	Various : Various	0.000	0.500	Jan 2023	0.000		0.000		-		0.000	0.000	0.500	-
C752 - Metallic Additive Manufacturing (AM)	TBD	Various : Various	0.000	0.000		0.500	Sep 2024	0.000		-		0.000	0.000	0.500	-
C634 - Polymorphic Build Farms	WR	NSWC DD : NSWC DD	0.000	0.428	Oct 2022	0.000		0.000		-		0.000	0.000	0.428	-
C634 - Polymorphic Build Farms	C/CPFF	Various : Various	0.000	1.219	Sep 2022	0.000		0.000		-		0.000	0.000	1.219	-
C753 - Critical Protection Techonology	MIPR	Various : Various	0.000	1.653	Sep 2022	1.170	May 2023	0.000		-		0.000	0.000	2.823	-
C545 - Marine Energy Systems for Sensors and Microgrids	MIPR	GSA : Various	0.000	0.000		1.500	May 2023	0.000		-		0.000	0.000	1.500	-
Subtotal			0.494	3.800		4.170		0.000		-		0.000	0.000	8.464	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	TBD	Various : Various	9.531	7.647	Jun 2023	0.000		0.000		-		0.000	0.000	17.178	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	TBD	Various : Various	1.976	0.000		0.000		0.000		-		0.000	0.000	1.976	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	MIPR	GSA : Various	13.400	0.000		0.000		0.000		-		0.000	0.000	13.400	-
Subtotal			24.907	7.647		0.000		0.000		-		0.000	0.000	32.554	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design					Project (Number/Name) 9999 / Congressional Adds				
Management Services (\$ in Millions)															
				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
C602 - Project Support	WR	Various : Various	2.000	0.000		2.000	Jul 2023	0.000		-		0.000	0.000	4.000	-
C752 - Metallic Additive Manufacturing (AM)	TBD	Various : Various	0.000	0.724	Sep 2023	0.000		0.000		-		0.000	0.000	0.724	-
C753 - Critical Protection Technology	WR	NSWC CD : Besthesda, MD	0.000	0.100	Oct 2022	0.000		0.000		-		0.000	0.000	0.100	-
Subtotal			2.000	0.824		2.000		0.000		-		0.000	0.000	4.824	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			43.413	30.871		48.200		0.000		-		0.000	0.000	122.484	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy														Date: March 2023																																																																	
Appropriation/Budget Activity 1319 / 4														R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design								Project (Number/Name) 9999 / Congressional Adds																																																									
Proj 9999														FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028																																									
1Q				2Q				3Q				4Q				1Q				2Q				3Q				4Q				1Q				2Q				3Q				4Q				1Q				2Q				3Q				4Q																			
Advanced Manufacturing																Defense Industrial Skills and Technology Training																																																															
								Polymorphic Build Farm for Open Source Technologies																																																																							
								Metallic Advanced Manufacturing																																																																							
								Critical Protection Technology																																																																							
								Portable High-Pressure Cold Spray																																																																							
																Digital Maintenance Advisor for Shipboard Readiness																																																															

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603563N / Ship Concept Advanced Design	Project (Number/Name) 9999 / Congressional Adds	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
Advanced Manufacturing	1	2022	2	2022
Defense Industrial Skills and Technology Training	1	2023	4	2024
Polymorphic Build Farm for Open Source Technologies	2	2022	4	2023
Metallic Advanced Manufacturing	1	2022	4	2024
Critical Protection Technology	1	2022	4	2023
Portable High-Pressure Cold Spray	1	2022	4	2023
Digital Maintenance Advisor for Shipboard Readiness	2	2023	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603564N I Ship Prel Design & Feasibility Studies							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	102.468	39.472	75.305	121.402	-	121.402	65.756	108.695	55.611	53.402	Continuing	Continuing
0409: DDG-51 Flt III Concept Development	5.196	5.995	6.107	20.682	-	20.682	15.750	32.987	3.812	1.527	Continuing	Continuing
0411: DDG(X) Concept Development	12.439	8.297	49.745	74.050	-	74.050	38.186	64.334	40.305	41.116	Continuing	Continuing
3389: OPLOG IPT Development	74.833	20.356	19.453	11.921	-	11.921	4.320	4.396	4.420	3.544	Continuing	Continuing
4044: Medium Landing Ship	0.000	0.000	0.000	14.749	-	14.749	7.500	6.978	7.074	7.215	Continuing	Continuing
9999: Congressional Adds	10.000	4.824	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	14.824
Program MDAP/MAIS Code: Project MDAP/MAIS Code(s): 180												
Note Project 3389 Prior years includes \$11.319M FY 2018 funding financed under this PE project 9999/C404 (Congressional add). Project 4044 Prior to FY24, RDT&E requirements were detailed in PE 0603563N/Ship Concept Advanced Design. Project 4044 Title updated from Next Generation Medium Amphibious Ship to Medium Landing Ship												
A. Mission Description and Budget Item Justification 0409 - This project provides Test and Evaluation (T&E) requirements for DDG-51 Flight III ships and efforts for the Navigation, Aviation and Hull, Mechanical & Electrical (HM&E) Cyber Enclaves Design for implementation on future new construction ships. T&E will concentrate on verifying integration and interoperability of employed technologies and systems in the DDG-51 FLT III design to achieve the mission capabilities and performance requirements as defined in the DDG-51 Flight III Capability Development Document (CDD), with Initial Operational Capability (IOC) in FY24. T&E functions will include the evaluation of Critical Technical Parameters (CTP), Measures of Effectiveness (MOE), Measures of Suitability (MOS), and Key Performance Parameters (KPP). Funding is also planned for the execution of Developmental Testing (DT), Operational Testing (OT), Live Fire Test and Evaluation (LFT&E), and, beginning in FY24, efforts to support Full Ship Shock Trials (FSST). The Navigation, Aviation and Hull, Mechanical & Electrical (HM&E) Cyber Enclaves Design effort will provide a new design to physically separate Hull, Mechanical, and Electrical (HM&E) communications from Navigation communications to meet multiple DoD Directives/Instructions on Cybersecurity and Navy Joint-SYSCOM Cybersecurity Standards on Enclave management. This design will be utilized to support implementation on future new construction DDG 51 class ships.												

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 0603564N <i>I Ship Prel Design & Feasibility Studies</i>
<p>0411 - The Navy's DDG(X) program is the Navy's Future Guided Missile Destroyer ship acquisition program to follow the DDG 51 class that is essential to field capabilities required for the future fight as validated by the Future Surface Combatant Force (FSCF) ICD, FSCF AoA, and Future Naval Force Study (FNFS). DDG(X) will integrate non-developmental systems into a new hull design that incorporates platform flexibility and the space, weight, power and cooling (SWAP-C) to meet future combatant force capability/system requirements that are not achievable without the new hull design. The DDG(X) platform will have the flexibility to rapidly and affordably upgrade to future warfighting systems when they become available as well as have improved range and fuel efficiency for increased operational flexibility and decreased demand on the logistics force. DDG(X) will provide an Integrated Power System(IPS) with flexibility to enable fielding of high demand electric weapons, sensor systems and computing resources. To decouple ship development risk from technology risk, accommodation of additional future capabilities will be pre-planned; these future capabilities may include: missile launchers capable of larger weapons to exceed adversary capabilities, high power lasers, or other systems that can be efficiently incorporated when developed and demonstrated.</p> <p>3389 - Naval Operational Logistics (OPLOG) Integration IPT Development - Develops enabling technologies for future and in-service afloat operational logistics and integrated supply force and combatant logistics requirements; and conducts cooperative initiatives with acquisition programs, program sponsors, engineering managers, the Navy science and technology community and Fleet customers. OPLOG develops integrated, cross-platform (i.e. applicable to more than one ship class/type) operational logistics and energy conservation technologies and capabilities as well as draft acquisition and operations policy ensuring future Naval systems leverage emerging logistic capabilities and technologies to provide operationally effective and energy efficient logistics delivery.</p> <p>4044 - The Light Amphibious Warship (LAW) will be referred to as the Medium Landing Ship (LSM) going forward to align with the mission and distinguish between traditional amphibious ships. LSM is a medium-sized landing ship that enables distributed maneuver and logistics such as Distributed Maritime Operations (DMO), Littoral Operations in a Contested Environment (LOCE), and Expeditionary Advanced Base Operations (EABO) in support of the newly established Marine Littoral Regiment (MLR). It is designed to fill the gap in capability between the Navy's large, multipurpose amphibious warfare class ships and smaller landing vessels. This ship will deploy tailored logistics, select power projection and strike capabilities.</p> <p>C754 - Congressional Add for the Preliminary Ship Design of Next-Gen Hospital Ship - The T-AH(X) Hospital ship program will recapitalize aging Role 3 medical services ships. The primary mission of these ships is to provide rapid, flexible, and mobile acute health services support to military personnel deployed ashore and afloat with a secondary mission of providing mobile surgical hospital service and acute medical care for disaster or humanitarian relief. USNS MERCY class ships will retire from service beginning in FY 2036, after over 60 years of service. Conduct of a Requirements Evaluation Team for development of Top Level Requirements and performance of initial ship feasibility studies is planned.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0603564N I Ship Prel Design & Feasibility Studies			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	40.774	75.327	119.213	-	119.213
Current President's Budget	39.472	75.305	121.402	-	121.402
Total Adjustments	-1.302	-0.022	2.189	-	2.189
• Congressional General Reductions	-	-0.022			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.302	0.000			
• Program Adjustments	0.000	0.000	1.247	-	1.247
• Rate/Misc Adjustments	0.000	0.000	0.942	-	0.942
Congressional Add Details (\$ in Millions, and Includes General Reductions)				FY 2022	FY 2023
Project: 9999: Congressional Adds					
Congressional Add: Preliminary ship design of next-gen hospital ship				4.824	0.000
Congressional Add Subtotals for Project: 9999				4.824	0.000
Congressional Add Totals for all Projects				4.824	0.000
Change Summary Explanation					
Project 0409: Funding increase supports the additional scope for Full Ship Shock Trials (FSST) planning, additional scope for the Cyber Enclaves design effort, and the increase in effort for the Flight III LFT&E program with the start of survivability testing drill development in FY 2024.					
Project 0411: FY 2024 funding continues the design team ramp up to execute preliminary design activities and begin initial procurement of design information for select systems.					
Project 3389: FY 2024 funding supports the materials procured for Seabased Petroleum Distribution System (SPDS) and improved Modular Fuel Delivery Station (iMFDS) fabrication.					
Project 4044: FY 2024 increase due to realigning of project from PE 0603563N, Ship Concept Advanced Design, and funding required to support a lead ship in FY 2025.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies				Project (Number/Name) 0409 / DDG-51 Flt III Concept Development			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0409: DDG-51 Flt III Concept Development	5.196	5.995	6.107	20.682	-	20.682	15.750	32.987	3.812	1.527	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 180												

A. Mission Description and Budget Item Justification

This project provides Test and Evaluation (T&E) requirements for DDG-51 Flight III ships and efforts for the Navigation, Aviation and Hull, Mechanical & Electrical (HM&E) Cyber Enclaves Design for implementation on future new construction ships.

T&E will concentrate on verifying integration and interoperability of employed technologies and systems in the DDG-51 FLT III design to achieve the mission capabilities and performance requirements as defined in the DDG-51 Flight III Capability Development Document (CDD), with Initial Operational Capability (IOC) in FY24. T&E functions will include the evaluation of Critical Technical Parameters (CTP), Measures of Effectiveness (MOE), Measures of Suitability (MOS), and Key Performance Parameters (KPP). Funding is also planned for the execution of Developmental Testing (DT), Operational Testing (OT), Live Fire Test and Evaluation (LFT&E), and, beginning in FY24, efforts to support Full Ship Shock Trials (FSST).

The Navigation, Aviation and Hull, Mechanical & Electrical (HM&E) Cyber Enclaves Design effort will provide a new design to physically separate Hull, Mechanical, and Electrical (HM&E) communications from Navigation communications to meet multiple DoD Directives/Instructions on Cybersecurity and Navy Joint-SYSCOM Cybersecurity Standards on Enclave management. This design will be utilized to support implementation on future new construction DDG 51 class ships.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: DDG-51 Flight III Test and Evaluation	5.995	6.107	11.833	0.000	11.833
Articles:	-	-	-	-	-
FY 2023 Plans: Continue M&S efforts and model updates. Update threat models and tools as necessary to support Live Fire Test and Evaluation (LFT&E) survivability and vulnerability assessments. Integrate threat models and build Ship Infrared Model (IR). Conduct M&S runs for the record and conduct Verification, Validation and Accreditation of LFT&E models. Conduct cybersecurity developmental testing on DDG-51 FLT III to include Cooperative Vulnerability Identification (CVI) and Adversarial Cybersecurity DT Event (ACD).					
FY 2024 Base Plans: Continue M&S efforts and model updates. Complete M&S runs for the record and analysis, initiate test plan development for future Failure and Recovery Mode (FARM) testing, and generate an Initial Survivability					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / <i>Ship Prel Design & Feasibility Studies</i>	Project (Number/Name) 0409 / <i>DDG-51 Flt III Concept Development</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Assessment Report (ISAR). Begin formal planning for Full Ship Shock Trials (FSST) to include: environmental protection planning efforts, instrumentation installation planning, and test planning. Begin execution of Developmental Testing (DT), Operational Testing (OT), and Live Fire Test and Evaluation (LFT&E).</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$5.726M from FY2023 to FY2024 represents the additional scope for FSST planning and the increase in effort for the Flight III LFT&E program with the start of survivability testing drill development in FY2024.</p>					
<p>Title: Navigation, Aviation, and Hull Mechanical & Electrical (HM&E) Cyber Enclaves Design</p> <p>Articles:</p> <p>FY 2023 Plans: N/A</p> <p>FY 2024 Base Plans: Initiate design effort for the implementation of a Dual Enclave design to physically separate Hull, Mechanical, and Electrical (HM&E) communications from Navigation communications. Develop system requirements, software requirements, and define testing requirements and plans to support Preliminary Design Review (PDR) in Q4 2024.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase in FY2024 initiated the design effort for the Navigation, Aviation, and Hull Mechanical and Electrical (HM&E) Cyber Enclaves for implementation on future new construction ships. FY2024 is the first year of this effort.</p>	0.000 -	0.000 -	8.849 -	0.000 -	8.849 -
Accomplishments/Planned Programs Subtotals	5.995	6.107	20.682	0.000	20.682

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• SCN 2122/5300: <i>DDG-51 Class</i>	3,841.740	7,870.766	4,709.131	-	4,709.131	4,524.569	4,321.240	4,351.256	4,767.817	4,927.728	137,974.806

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies	Project (Number/Name) 0409 / DDG-51 Flt III Concept Development	

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
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Remarks

D. Acquisition Strategy

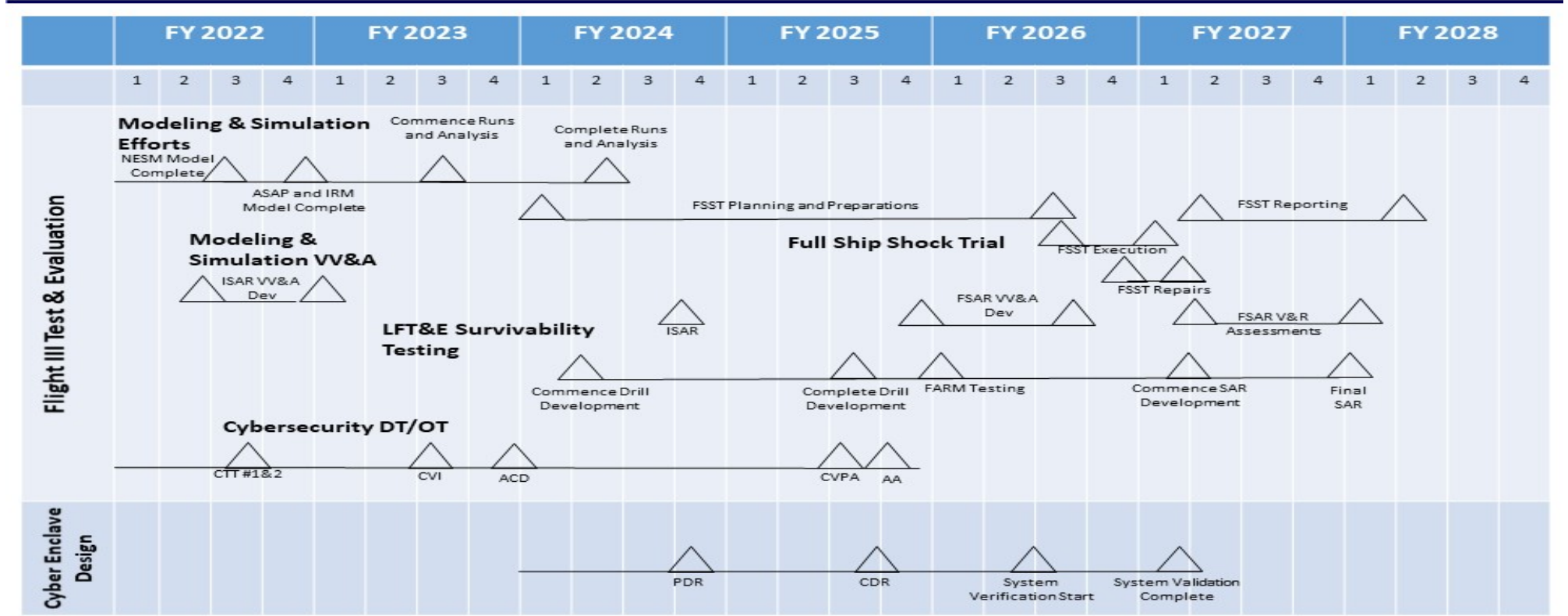
The DDG-51 class ships use a competitive acquisition strategy using Multi-Year Procurement (MYP) contracts awarded to two shipbuilders. DDG 51 follows a similar MYP strategy to support ship procurements for FY 2023 - FY 2027 and will continue this approach for FY 2028 and follow years.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies				Project (Number/Name) 0409 / DDG-51 Flt III Concept Development					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	SS/CPFF	Boeing : Huntington Beach, CA	0.000	0.000		0.000		7.102	Dec 2023	-		7.102	0.000	7.102	-
Systems Engineering	WR	NIWC Pacific : San Diego, CA	0.000	0.000		0.000		0.500	Oct 2023	-		0.500	0.000	0.500	-
Systems Engineering	WR	NSWC PD : Philadelphia, PA	0.000	0.000		0.000		1.000	Oct 2023	-		1.000	0.000	1.000	-
Systems Engineering	Various	Various : Various	0.000	0.000		0.000		0.245	Nov 2023	-		0.245	0.000	0.245	-
Subtotal			0.000	0.000		0.000		8.847		-		8.847	0.000	8.847	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Live Fire Test & Evaluation (LFT&E)	WR	NRL : Washington, DC	0.205	0.327	Oct 2021	0.536	May 2023	0.020	Oct 2023	-		0.020	Continuing	Continuing	Continuing
Live Fire Test & Evaluation (LFT&E)	WR	NSWC CD : Bethesda, MD	1.395	1.488	Oct 2021	0.719	Dec 2022	6.845	Oct 2023	-		6.845	Continuing	Continuing	Continuing
Live Fire Test & Evaluation (LFT&E)	Various	T&E Solutions : Various	0.805	1.285	Apr 2022	0.883	Mar 2023	0.725	Dec 2023	-		0.725	Continuing	Continuing	Continuing
Live Fire Test & Evaluation (LFT&E)	Various	Various : Various	1.513	1.412	Nov 2021	0.510	Nov 2022	2.245	Nov 2023	-		2.245	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	Various	Various : Various	1.278	1.483	Nov 2021	3.459	Mar 2023	2.000	Dec 2023	-		2.000	Continuing	Continuing	Continuing
Subtotal			5.196	5.995		6.107		11.835		-		11.835	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			5.196	5.995		6.107		20.682		-		20.682	Continuing	Continuing	N/A
Remarks FY2024 award dates assume appropriations received for start of the fiscal year.															

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy		Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies		Project (Number/Name) 0409 / DDG-51 Flt III Concept Development

RDTE Schedule FY24 R-Exhibit



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / <i>Ship Prel Design & Feasibility Studies</i>	Project (Number/Name) 0409 / <i>DDG-51 Flt III Concept Development</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 0409				
DDG 51 Flight III Test and Evaluation: Initial Survivability Assessment Report (ISAR) Verification, Validation & Accreditation (VV&A) Development	2	2022	1	2023
DDG 51 Flight III Test and Evaluation: Cyber Table Top (CTT) 1&2	3	2022	3	2022
DDG 51 Flight III Test and Evaluation: Conduct Modeling and Simulation (M&S) Runs, and Analysis	3	2023	2	2024
DDG 51 Flight III Test and Evaluation: Cooperative Vulnerability Identification (CVI)	3	2023	3	2023
DDG 51 Flight III Test and Evaluation: Adversarial Cybersecurity DT Event (ACD)	4	2023	4	2023
DDG 51 Flight III Test and Evaluation: Survivability Test Development	2	2024	3	2025
DDG 51 Flight III Test and Evaluation: Full Ship Shock Trial (FSST) Planning	1	2024	3	2026
DDG 51 Flight III Test and Evaluation: Initial Survivability Assessment Report (ISAR)	4	2024	4	2024
DDG 51 Flight III Test and Evaluation: Cooperative Vulnerability Penetration Assessment (CVPA)	3	2025	3	2025
DDG 51 Flight III Test and Evaluation: Adversarial Assessment (AA)	4	2025	4	2025
DDG 51 Flight III Test and Evaluation: Final Survivability Assessment Report (FSAR) Verification, Validation & Accreditation (VV&A) Development	4	2025	3	2026
DDG 51 Flight III Test and Evaluation: Conduct Failure and Recoverability Mode (FARM) Testing	1	2026	1	2026
DDG 51 Flight III Test and Evaluation: Full Ship Shock Trial (FSST) Execution	3	2026	1	2027
DDG 51 Flight III Test and Evaluation: Full Ship Shock Trial (FSST) Repairs	4	2026	1	2027
DDG 51 Flight III Test and Evaluation: Final Survivability Assessment Report (FSAR) V & R Assessments	2	2027	1	2028
DDG 51 Flight III Test and Evaluation: Final Survivability Assessment Report (SAR) Development	2	2027	1	2028

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies		Project (Number/Name) 0409 / DDG-51 Flt III Concept Development	

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies				Project (Number/Name) 0411 / DDG(X) Concept Development			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0411: DDG(X) Concept Development	12.439	8.297	49.745	74.050	-	74.050	38.186	64.334	40.305	41.116	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

To compete and win in an era of great power competition, the United States needs a balanced Naval force, capable of striking targets from all domains. The force design must emphasize distributed awareness, lethality and survivability in high-intensity conflict. The force must be adaptable, demonstrate presence, and be capable of projecting power by delivering precision effects at long ranges. The Future Naval Force Study (FNFS) and the Future Surface Combatant Force Analysis of Alternatives (FSCF AoA) identified the requirement for future large surface combatants (LSCs) to be capable of hosting directed energy (DE) weapons, larger missiles for increased range and speed, increased magazine depth, growth in organic sensors, and an efficient integrated power system to manage the dynamic loads. DDG 51 Flight (FLT) III is highly capable, but after over 40 years in production and 30 years of upgrades the hull form does not provide sufficient space and center of gravity margin to host these future capabilities. To reset these design allowances for the future of naval warfare, requirements tradeoff and design studies were performed from FY 2018 to FY 2020 that considered modification of existing surface combatant and amphibious ships in addition to new concepts. These studies concluded that DDG(X) is required to deliver the necessary margins and flexibility to succeed the DDG 51 Class as the next enduring LSC combining the DDG 51 FLT III combat system elements with new hull form, an efficient Integrated Power System (IPS) and greater endurance reducing the Fleet logistics burden. By including the DDG 51 FLT III combat system in a new DDG(X) hull, mechanical and electrical (HM&E) baseline, Navy is taking an "evolutionary" (vice "revolutionary") approach to the class. This is a critical lesson learned proven by the successful evolution of the original DD 963 Spruance design of the early 1970s that focused on lead ship HM&E capabilities and upgraded warfare capability over the next 50 years, including evolving DD 963 into the CG 52 class and incorporating the Aegis Combat System. In the early 1980's, the DDG 51 class applied a similar approach by incorporating the proven Aegis Combat System into a new hull form and subsequently executing upgrades over a period greater than 40 years before reaching hull limitations on incorporation of new, larger systems. When DDG(X) enters production, over 30 DDG 51 FLT III Ships will have been in production and early DDG(X) production transition will overlap DDG 51 FLT III production ensuring stability in the Large Surface Combatant industrial base. Furthermore, the first DDG 51 FLT III ship entered production in FY 2017 and will not be able to accommodate any significant capability upgrades due to SWAP-c constraints.

The CNO approved DDG(X) Top Level Requirements (TLR) in December 2020 that set the basis for a draft Capabilities Development Document (CDD) released in October 2021. The CDD will enter staffing in FY 2025 and will be validated in FY 2026. FY 2021 and 2022 focused on concept formulation; collaboration with DDG 51 shipyards in program planning; and targeted trade studies to achieve the CNO's cost, schedule and performance targets. FY 2023 efforts established derived requirements from the Draft CDD; specification development; completed system development planning; conducted Systems Requirement Review (SRR); started Preliminary Design; established development and test planning for critical systems per sections 1034 and 131 of the FY 2020 NDAA; and preparations for Contract Design beginning in FY 2027. The planned DDG 51 FLT III follow-on procurements will maintain the industrial base while the DDG(X) design and risk reduction efforts are executed in parallel.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies		Project (Number/Name) 0411 / DDG(X) Concept Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: DDG(X) Design and Analysis		8.297	49.745	74.050	0.000	74.050
Articles:		-	-	-	-	-
Description: DDG(X) Design and Analysis efforts include all of the program and engineering efforts necessary to mature a functional ship design that meets validated requirements. DDG(X) design maturation will occur through the development of progressive technical data packages (TDP) that form design baselines. A collaborative, multi-disciplinary Navy and industry team will develop TDPs using an Integrated Product and Process Development (IPPD) type programmatic approach over four phases: Concept Formulation (FY 2023 complete), Preliminary Design (FY 2023-2027), Contract Design (FY 2027 start), and Detail Design & Construction. Preliminary Design activities will incorporate shipbuilder design inputs into Navy managed specifications and critical system development activities.						
DDG(X) has assessed two critical systems in accordance sections 1034 and 131 of the FY 2020 National Defense Authorization Act (NDAA): Hull and Integrated Power Systems (IPS). Requirements for DDG(X) necessitate a new hull form. The new hull form will be designed, modeled, tested, and verified prior to Detail Design as risk reduction to engineering changes or potential operational limitations upon delivery. DDG(X) Design and Analysis efforts provide the management and development of derived requirements and specifications to inform the IPS risk reduction procurement and testing executed under PE 0603573N / PU 2471. IPS test findings will be incorporated in final specifications and design products developed under this PE (0603564N / 0411) ensuring that the ship can accommodate the space, weight, power, cooling (SWAP-C) of the IPS and that the IPS can meet DDG(X) power and energy requirements.						
FY 2023 Plans:						
FY 2023 will focus on finalization of Concept Formulation, execution of a System Requirements Review I (SRR-I) and starting Preliminary Design. The collaborative Navy/Industry team will continue to conduct cost and capability trades to complete Concept Formulation and refine design solutions where appropriate to ensure ship design meets acquisition and life cycle cost goals. SRR-I will be conducted to ensure the government has established performance requirements and non-tailorable design requirements are traceable to the CDD. Successful completion of the SRR-1 will initiate the Preliminary Design phase that develops two-dimensional and three-dimensional designs of DDG(X) traceable to an initial ship specification that supports a Functional Baseline Technical Data Package (TDP) in FY 2027. Preliminary Design will begin with the selection of major system components for the functional baseline including power and propulsion system components and deck systems. Key Preliminary Design activities include developing ship configuration and arrangements, overall						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603564N / <i>Ship Prel Design & Feasibility Studies</i>	Project (Number/Name) 0411 / <i>DDG(X) Concept Development</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO
<p>allocation of space to system architectures, major propulsion, electrical, mission essential mechanical and combat system elements, vendor selections where appropriate and possible, interface control specifications for future warfare systems integration, long lead material candidates, ship manning, cyber-functionality of systems and components, and aviation integration. Development of the specifications and refinement of the Draft CDD requirements in FY 2023 will be accomplished with industry partners to ensure producibility and affordability of detail design and ship construction are taken into account.</p> <p>FY 2023 funds will resource the collaborative design team to an executable level that forms the basis for a design workforce that can execute later design activities. The design team will mature parallel efforts of ship baseline design and critical systems, Hull Form and IPS, to satisfy sections 1034 and 131 of the FY 2020 NDAA and section 221 of the FY 2022 NDAA.</p> <p>- Hull Form risk reduction in FY 2023 will be focused on design and analysis of exploratory hull form model testing completed in FY 2021. The testing results identified hull characteristics from existing hull forms that require iterative refinement to finalize the hull form in FY 2025. Analysis informs the DDG(X) structural design, propeller design, and ship stability that will be tested prior to Milestone B.</p> <p>- IPS specifications derived from DDG(X) ship requirements will be developed to support risk reduction activities and test site hardware procurements via 0603573N/PU 2471.</p> <p>FY 2024 Base Plans:</p> <p>FY 2024 will focus on maturation of DDG(X) Preliminary Design through hull form and arrangements design, system descriptions and trade studies to establish baseline ship specifications in FY 2025. Industry team members will engage with the industrial supplier base to define ship equipment, including initial procurement of design information for select systems. Aggregation of this information will support the critical design milestone finalizing ship dimensions at Ship Configuration Lock in FY 2025. The draft CDD will be matured in preparation to enter JROC staffing in FY 2025. Development of 3D structural models will commence to support an integrated 3D product model in late FY 2025. Analyses of Warfare System integration requirements will continue to support completion of Interface Control Documents (ICDs) in FY 2025 and the integration of planned and future warfare systems. Utilizing the DDG(X) Integrated Product Process Development (IPPD) type programmatic approach, development of Preliminary Build Strategies and Maintenance Strategy will enable production informed design decisions.</p> <p>The design team will mature parallel efforts of ship baseline design and critical systems, Hull Form and IPS, to satisfy sections 1034 and 131 of the FY 2020 NDAA and section 221 of the FY 2022 NDAA.</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603564N / <i>Ship Prel Design & Feasibility Studies</i>		Project (Number/Name) 0411 / <i>DDG(X) Concept Development</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Hull Form risk reduction efforts in FY 2024 continue FY 2023 analytical activities that ensures a fuel efficient hull form will accommodate all major equipment (motors, drives, generators, etc.). This serves as the primary input to finalizing the ship dimensions at Ship Configuration Lock and enables development of physical hull models required for hull critical system testing starting in FY 2025. This testing will continue prior to Milestone B to validate DDG(X) structural design, propeller design, and ship stability.</p> <p>IPS design will be matured to continue development of specifications derived from DDG(X) ship requirements to continue to support risk reduction activities and test site hardware procurements via 0603573N/PU 2471.</p> <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> The FY 2024 funding increase from FY 2023 continues the design team ramp up from FY2023 to execute preliminary design activities and begin initial procurement of design information for select systems.</p>						
Accomplishments/Planned Programs Subtotals		8.297	49.745	74.050	0.000	74.050
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy A formal acquisition strategy for DDG(X) is still being developed and will align with Section 130 of the FY 2023 NDAA (CONTRACTS FOR DESIGN AND CONSTRUCTION OF THE DDG(X) DESTROYER PROGRAM). Preliminary, Contract and Detail Designs for DDG(X) will be accomplished through a collaborative, multidisciplinary Navy/Industry team composed of the LSC shipbuilders, suppliers, ship design agents and other subject matter experts. The Navy's intent is to ensure a smooth, overlapping transition between Arleigh Burke (DDG 51) Class and DDG(X). As maturity of the design increases, it is expected that the shipbuilders will take on an increasing level of responsibility for the design.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies					Project (Number/Name) 0411 / DDG(X) Concept Development				
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
DDG(X) Design and Analysis	C/CPAF	Industry : Various	2.363	3.222	Nov 2021	14.629	Nov 2022	15.713	Dec 2023	-		15.713	Continuing	Continuing	Continuing
DDG(X) Design and Analysis	SS/CPAF	Shipbuilders (BIW/HII) : Various	1.011	1.990	Nov 2021	13.346	Nov 2022	35.084	Nov 2023	-		35.084	Continuing	Continuing	Continuing
DDG(X) Design and Analysis	WR	Other Government Organizations : Various	0.287	0.000	Nov 2021	4.671	Nov 2022	7.905	Dec 2023	-		7.905	Continuing	Continuing	Continuing
DDG(X) Design and Analysis	WR	NSWC Carderock : Carderock, MD	2.087	2.015	Nov 2021	8.333	Nov 2022	6.776	Nov 2023	-		6.776	Continuing	Continuing	Continuing
DDG(X) Design and Analysis	WR	NSWC Philadelphia : Philadelphia, PA	1.422	0.326	Nov 2021	5.130	Nov 2022	5.129	Dec 2023	-		5.129	Continuing	Continuing	Continuing
DDG(X) Design and Analysis	WR	NSWC Dahlgren : Dahlgren, VA	0.676	0.404	Nov 2021	3.022	Nov 2022	2.236	Dec 2023	-		2.236	Continuing	Continuing	Continuing
Power & Prop Risk Mitigation	WR	Other Government Organizations : Various	2.118	0.000		0.000		0.000		-		0.000	0.000	2.118	-
Power & Prop Risk Mitigation	C/CPFF	Various : Various	1.882	0.000		0.000		0.000		-		0.000	0.000	1.882	-
Subtotal			11.846	7.957		49.131		72.843		-		72.843	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	Various : Various	0.593	0.340	Oct 2021	0.614	Nov 2022	1.207	Dec 2023	-		1.207	Continuing	Continuing	Continuing
Subtotal			0.593	0.340		0.614		1.207		-		1.207	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			12.439	8.297		49.745		74.050		-		74.050	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy							Date: March 2023		
Appropriation/Budget Activity 1319 / 4			R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies			Project (Number/Name) 0411 / DDG(X) Concept Development			
	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Remarks									

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity
1319 / 4

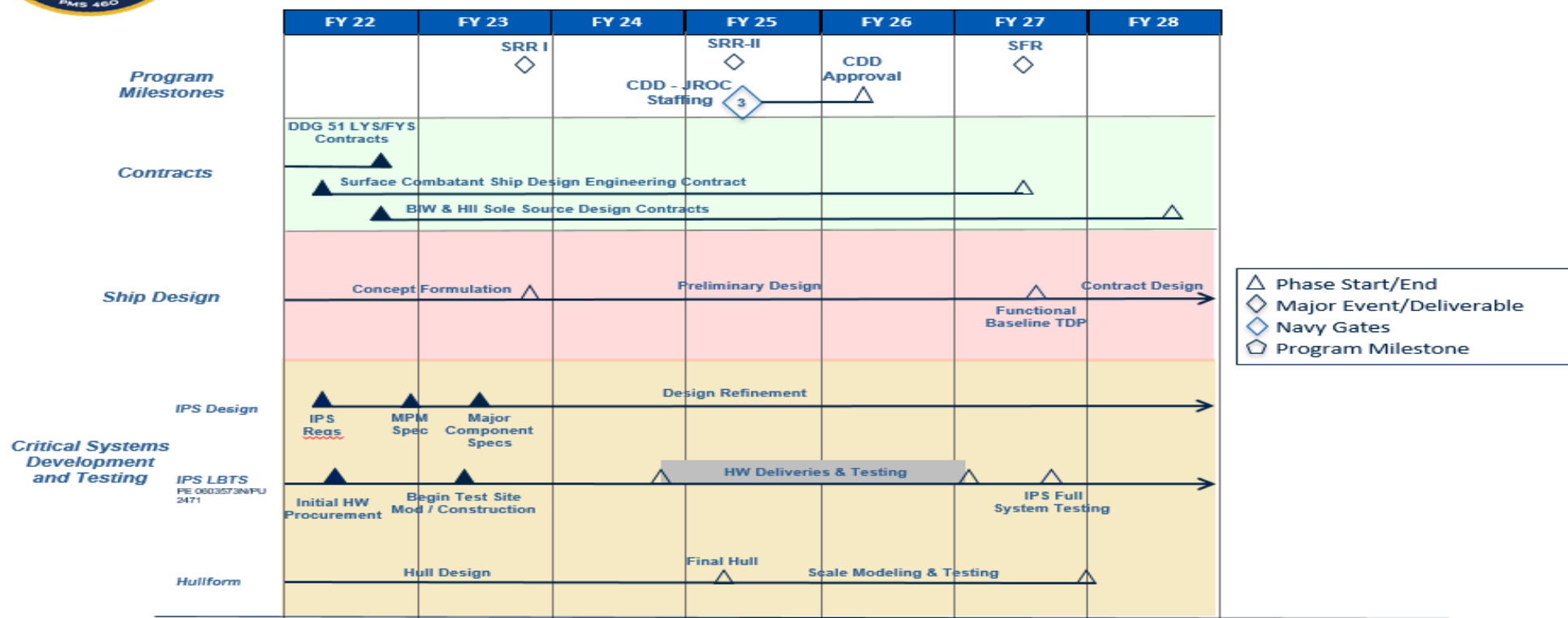
R-1 Program Element (Number/Name)
PE 0603564N / Ship Prel Design & Feasibility Studies

Project (Number/Name)
0411 / DDG(X) Concept Development



FY24 FYDP Destroyer Guided Missile DDG(X) Schedule

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies	Project (Number/Name) 0411 / DDG(X) Concept Development	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 0411				
Conceptual Formulation	1	2022	4	2023
System Requirements Review	4	2023	4	2023
Preliminary Design	4	2023	3	2027
System Functional Review	3	2027	3	2027
Contract Design	3	2027	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies				Project (Number/Name) 3389 / OPLOG IPT Development			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3389: OPLOG IPT Development	74.833	20.356	19.453	11.921	-	11.921	4.320	4.396	4.420	3.544	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

FY 2016 and prior year efforts were financed under NDSF BA4 PE 0408042N Project 3117 Naval Operational Logistics (OPLOG) Integration. FY 2017, FY 2019 and forward is financed under this Program Element (Project 3389). FY 2018 financed under Congressional add Project 9999/C404 included in prior years shown in this budget.

A. Mission Description and Budget Item Justification

Project 3389 - Develops enabling technologies for future and in-service afloat operational logistics and integrated supply systems; defines integrated combat logistics force and combatant logistics requirements; and conducts cooperative initiatives with acquisition programs, program sponsors, engineering managers, the Navy science and technology community, and Fleet customers. Operational Logistics Integration R&D (OPLOG) develops new logistics platforms, integrated cross-platform (i.e., applicable to more than one ship class/type) operational logistics and operational energy technologies and capabilities, as well as draft acquisition and operations policy ensuring future Naval systems leverage emerging logistic capabilities and technologies to provide operationally effective and efficient logistics delivery for both peacetime and wartime contested environments.

Though the operational logistics family of systems touches all aspects of Naval presence and power projection, operational logistics capability and system interfaces typically have been left to individual acquisition programs to develop and resolve. Technology development is necessary to mitigate technological and operational risk before ship acquisition programs accept new technologies. This project provides a foundation for the transition and systems development of science & technology initiatives evolving from the Office of Naval Research (ONR) Power & Energy Future Naval Capabilities (FNC), Enterprise and Platform Enablers FNC, Seabasing FNC, and from other enabling Government, industry and academia concepts to the acquisition community. Thus, this project resources continued research and development of appropriate technologies with applicability to multiple acquisition programs and defines and matures performance and interface requirements for those technologies. This project continues to identify, develop, integrate, demonstrate, and transition logistics technologies to improve both the cost effectiveness of Fleet at sea logistics delivery in peacetime, as well as delivery capability effectiveness in wartime, through outreach, coordination and collaboration with industry, academia, Fleet, and Enterprise representatives.

This project will continue to develop new logistics platforms, improved shipboard replenishment, transfer, and handling systems and components, as well as asset visibility and standardized packaging technologies. This project includes development of approaches to reduce operation and maintenance costs of, and energy consumption by the logistics Fleet. This integrated suite of developed capabilities will enable multiple ship types to leverage technologies common across DoD (Joint) and commercial transportation networks to provide a more affordable, energy efficient, and contested environment mission capable force. These capabilities and system-of-systems approach will be applied to concept development of future auxiliary force architectures.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies		Project (Number/Name) 3389 / OPLOG IPT Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Advanced Systems		19.991	19.388	11.856	0.000	11.856
Articles:		-	-	-	-	-
FY 2023 Plans: Research, development, and testing of advanced refueling systems and concepts to include: completing operationally relevant testing of the subscale Seabased Petroleum Distribution System (SPDS) prototype and continue development of the full scale prototype, to include large materials procurement and continuation of full scale prototype fabrication, and starting the tech data package; continue improved Modular Fuel Delivery Station (iMFDS) development, prototype fabrication and prepare for land based testing; complete additional prototype fabrication and testing of Modular CONSOL Adapter Kits (MCAK).						
FY 2024 Base Plans: Research, development, and testing of advanced refueling systems and concepts to include: completion of the full scale Seabased Petroleum Distribution System (SPDS) prototype, to include fabrication and testing and continuation of the tech data package; complete iMFDS land based test, prepare for and complete pierside testing and start development of the tech data package.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: Decrease of funding by \$7.532 due to a decrease in materials procured for SPDS and iMFDS fabrication in FY 2024.						
Title: Logistics Architectures		0.065	0.065	0.065	0.000	0.065
Articles:		-	-	-	-	-
Description: This is annual funding needed by the Center for Naval Analyses (CNA) to maintain the Combat Logistics Force database so OPLOG can utilize the data to support logistics R&D and concept development.						
FY 2023 Plans: Center for Naval Analyses (CNA) collects data and maintains the Combat Logistics Force (CLF) database to support ongoing and future analyses for OPLOG R&D.						
FY 2024 Base Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies		Project (Number/Name) 3389 / OPLOG IPT Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Center for Naval Analyses (CNA) collects data and maintains the Combat Logistics Force (CLF) database to support ongoing and future analyses for OPLOG R&D.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: No change.						
Title: Shipboard Energy Conservation (E-STREAM)		0.300	0.000	0.000	0.000	0.000
Articles:		-	-	-	-	-
FY 2023 Plans: N/A						
FY 2024 Base Plans: N/A						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: N/A						
Accomplishments/Planned Programs Subtotals		20.356	19.453	11.921	0.000	11.921
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy Not applicable for OPLOG R&D efforts						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies						Project (Number/Name) 3389 / OPLOG IPT Development			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	Various	VARIOUS : Various	28.015	8.600	Jan 2022	10.828	Jan 2023	3.108	Jan 2024	-		3.108	Continuing	Continuing	Continuing
Ancillary Hardware Development	Various	VARIOUS : Various	8.509	2.247	Jan 2022	2.750	Jan 2023	0.750	Jan 2024	-		0.750	Continuing	Continuing	Continuing
Ship Integration	Various	VARIOUS : Various	4.300	0.700	Jan 2022	0.650	Jan 2023	0.550	Jan 2024	-		0.550	Continuing	Continuing	Continuing
Ship Suitability	Various	VARIOUS : Various	3.300	0.300	Jan 2022	0.250	Jan 2023	0.200	Jan 2024	-		0.200	Continuing	Continuing	Continuing
System Engineering	Various	VARIOUS : Various	6.750	0.850	Jan 2022	0.465	Jan 2023	0.450	Jan 2024	-		0.450	Continuing	Continuing	Continuing
Subtotal			50.874	12.697		14.943		5.058		-		5.058	Continuing	Continuing	N/A
Remarks															
1. Primary Hardware Development, Ancillary Hardware Development and System Engineering is related to the Advanced Systems CONSOL, iMFDS, and SeaBased Petroleum Distribution System (SPDS) prototype development															
2. Award dates reflect initial award of incremental execution.															
3. PY includes FY 2017 project 3389 and FY 2018 Congressional Add project C404.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Various	VARIOUS : Various	4.095	0.434	Jan 2022	0.520	Jan 2023	0.425	Jan 2024	-		0.425	Continuing	Continuing	Continuing
Software Development	Various	VARIOUS : Various	0.150	0.025	Jan 2022	0.025	Jan 2023	0.025	Jan 2024	-		0.025	Continuing	Continuing	Continuing
Integrated Logistics Support	Various	VARIOUS : Various	1.343	0.150	Jan 2022	0.080	Jan 2023	0.080	Jan 2024	-		0.080	Continuing	Continuing	Continuing
Configuration Management	Various	VARIOUS : Various	3.132	0.100	Jan 2022	0.075	Jan 2023	0.075	Jan 2024	-		0.075	Continuing	Continuing	Continuing
Technical Data	Various	VARIOUS : Various	2.750	0.150	Jan 2022	0.125	Jan 2023	0.125	Jan 2024	-		0.125	Continuing	Continuing	Continuing
Studies & Analysis	Various	VARIOUS : Various	1.110	0.700	Jan 2022	0.650	Jan 2023	0.300	Jan 2024	-		0.300	Continuing	Continuing	Continuing
Subtotal			12.580	1.559		1.475		1.030		-		1.030	Continuing	Continuing	N/A
Remarks															
1. Award dates reflect initial award of incremental execution.															
2. PY includes FY 2017 project 3389 and FY 2018 Congressional Add project C404.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies						Project (Number/Name) 3389 / OPLOG IPT Development			
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	Various	VARIOUS : Various	5.375	2.900	Jan 2022	2.200	Jan 2023	2.958	Jan 2024	-		2.958	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	Various	VARIOUS : Various	3.924	2.800	Jan 2022	0.460	Jan 2023	2.500	Jan 2024	-		2.500	Continuing	Continuing	Continuing
Subtotal			9.299	5.700		2.660		5.458		-		5.458	Continuing	Continuing	N/A
Remarks															
1. Award dates reflect initial award of incremental execution.															
2. PY includes FY 2017 project 3389 and FY 2018 Congressional Add project C404.															
3. Increase in FY 2024 for Operational Test & Evaluation supports the Seabased Petroleum Distribution System (SPDS) and Improved Modular Fuel Delivery System (iMFDS).															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	Various	VARIOUS : Various	0.811	0.150	Jan 2022	0.125	Jan 2023	0.125	Jan 2024	-		0.125	Continuing	Continuing	Continuing
Government Engineering Support	Various	VARIOUS : Various	1.269	0.250	Jan 2022	0.250	Jan 2023	0.250	Jan 2024	-		0.250	Continuing	Continuing	Continuing
Subtotal			2.080	0.400		0.375		0.375		-		0.375	Continuing	Continuing	N/A
Remarks															
1. Award dates reflect initial award of incremental execution.															
2. PY includes FY 2017 project 3389 and FY 2018 Congressional Add project C404.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			74.833	20.356		19.453		11.921		-		11.921	Continuing	Continuing	N/A
Remarks															

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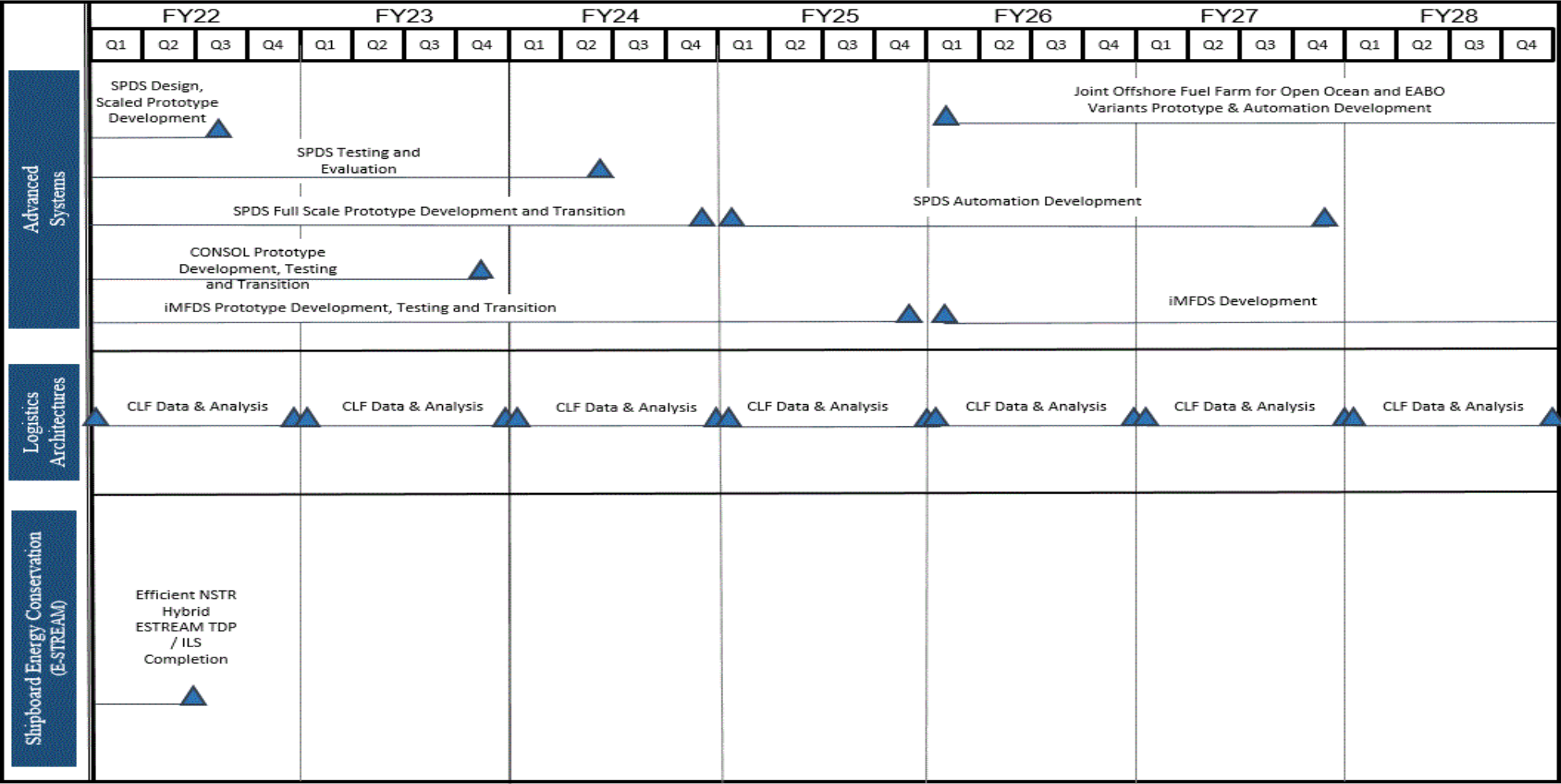
Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0603564N / Ship Prel Design & Feasibility Studies

Project (Number/Name)
3389 / OPLOG IPT Development



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies	Project (Number/Name) 3389 / OPLOG IPT Development

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3389				
Advanced Systems	1	2022	4	2028
Logistics Architectures	1	2022	4	2028
Shipboard Energy Conservation (E-STREAM)	1	2022	2	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies				Project (Number/Name) 4044 / Medium Landing Ship			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
4044: Medium Landing Ship	0.000	0.000	0.000	14.749	-	14.749	7.500	6.978	7.074	7.215	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Note Prior to FY24, RDT&E requirements were detailed in PE 0603563N/Ship Concept Advanced Design. PE changed to better align with scope of work for the program. Project Title updated from Next Generation Medium Amphibious Ship to Medium Landing Ship.												
A. Mission Description and Budget Item Justification The Light Amphibious Warship (LAW) will be referred to as the Medium Landing Ship (LSM) going forward to align with the mission and distinguish between traditional amphibious ships. LSM is a medium-sized landing ship that enables distributed maneuver and logistics such as Distributed Maritime Operations (DMO), Littoral Operations in a Contested Environment (LOCE), and Expeditionary Advanced Base Operations (EABO) in support of the newly established Marine Littoral Regiment (MLR). It is designed to fill the gap in capability between the Navy's large, multipurpose amphibious warfare class ships and smaller landing vessels. This ship will deploy tailored logistics, select power projection and strike capabilities.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Medium Landing Ship Articles: FY 2023 Plans: FY2023 Plans shown under PE 0603563N, Project 4044. FY 2024 Base Plans: Following the release of the Detail Design and Construction Request for Proposal (DD&C RFP) in FY 2023, the program will execute source selection efforts to support award by 2QFY25. Tasks include Engineering, Logistics, Program Management, and Test and Evaluation support. FY 2024 efforts will continue the development for Command, Control, Communications, Computers, and Intelligence (C4I) systems and shipboard network. Continue Government Furnished Equipment (GFE) systems engineering efforts to ensure full ship integration. Identification of cyber security/information assurance (IA) measures on the C4I suite to pace the current and future threats.								0.000	0.000	14.749	0.000	14.749
								-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603564N / <i>Ship Prel Design & Feasibility Studies</i>		Project (Number/Name) 4044 / <i>Medium Landing Ship</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Logistics tasks continue in training development, Integrated Logistics Assessment (ILA) results analysis and update, support for Planning and Design for Homeport 1, advance planning for Homeport 2, and updates to program Milestone documentation.</p> <p>Continue Test and Evaluation Master Plan (TEMP) updates and continue WIPTs required to achieve TEMP approval. Planning and execution of developmental test events.</p> <p>Program Management support continues for development of the statutory and regulatory required program documentation to support upcoming Navy Gate Program Reviews and the combine Milestone B/C. The focus of FY 2024 will be the source selection activities, including technical and cost evaluation to support an award in FY 2025.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase from FY 2023 to FY 2024 is the source selection efforts to award Lead Ship in FY 2025</p>						
Accomplishments/Planned Programs Subtotals		0.000	0.000	14.749	0.000	14.749
C. Other Program Funding Summary (\$ in Millions)						
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>Cost To Complete</u>
• SCN/3050: <i>Medium Landing Ship</i>	0.000	0.000	0.000	-	0.000	930.382
• 0603563N: <i>Medium Landing Ship</i>	12.667	12.167	0.000	-	0.000	44.864
Remarks						
D. Acquisition Strategy						
The Navy awarded the Concept Study/Preliminary Design contracts on 14 June 2021. Concept Studies completed in October 2021 and Preliminary Design options were exercised January 2022. The Detail Design and Construction award is planned for FY2025. This will allow the program to continue maturation of the design.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023					
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies						Project (Number/Name) 4044 / Medium Landing Ship					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total					
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract		
Concept Studies/ Preliminary Design/ Sensitivity Analysis	TBD	Various : Various	0.000	0.000		0.000		0.500	Nov 2023	-		0.500	Continuing	Continuing	Continuing		
Subtotal			0.000	0.000		0.000		0.500		-		0.500	Continuing	Continuing	N/A		
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total					
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract		
Engineering Support	TBD	Various : Various	0.000	0.000		0.000		7.700	Nov 2023	-		7.700	Continuing	Continuing	Continuing		
Logistics Support	TBD	Various : Various	0.000	0.000		0.000		1.700	Nov 2023	-		1.700	Continuing	Continuing	Continuing		
Program Mgmt Support	TBD	Various : Various	0.000	0.000		0.000		2.707	Nov 2023	-		2.707	Continuing	Continuing	Continuing		
Subtotal			0.000	0.000		0.000		12.107		-		12.107	Continuing	Continuing	N/A		
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total					
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract		
Developmental Test & Evaluation (DT&E)	TBD	Various : Various	0.000	0.000		0.000		2.142	Nov 2023	-		2.142	Continuing	Continuing	Continuing		
Subtotal			0.000	0.000		0.000		2.142		-		2.142	Continuing	Continuing	N/A		
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals			0.000	0.000		0.000		14.749		-		14.749	Continuing	Continuing	N/A		
Remarks																	

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PE 0603564N: *Ship Prel Design & Feasibility Studies*
Navy

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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / <i>Ship Prel Design & Feasibility Studies</i>
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Project (Number/Name) 4044 / <i>Medium Landing Ship</i>



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies	Project (Number/Name) 4044 / Medium Landing Ship	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 4044				
Capability Development Document	1	2022	3	2023
Analysis of Alternatives Sufficiency Review	2	2022	2	2023
Gate 2	2	2022	2	2022
Preliminary Design	2	2022	4	2022
Gate 3	2	2023	3	2023
Gate 4/5	3	2023	4	2023
Combined Milestone B/C	1	2025	1	2025
Detail Design & Construction Award	2	2025	2	2025
Start of Construction for Lead Ship	3	2026	3	2026

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies				Project (Number/Name) 9999 / Congressional Adds			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: Congressional Adds	10.000	4.824	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	14.824
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

With the mishaps related to the McCain and Fitzgerald collisions, the U.S. Navy seeks oversight and modernization of surface fleet bridge configurations. The goal of the Bridge Integration Program is to modernize bridges for functional commonality and improved watch stander performance. In order to identify trends that will improve to bridge commonality, rigorous and methodical data analysis, such as modeling and simulation, will be employed. The results of this analysis will ultimately lead to a reduced number of bridge configurations, allowing Sailors to more easily transition between ship assignments and reducing the cost of maintaining trainers across multiple bridge configurations.

The T-AH(X) Hospital ship program will recapitalize aging Role 3 medical services ships. The primary mission of these ships is to provide rapid, flexible, and mobile acute health services support to military personnel deployed ashore and afloat with a secondary mission of providing mobile surgical hospital service and acute medical care for disaster or humanitarian relief. USNS MERCY class ships will retire from service beginning in FY36, after over 60 years of service. Conduct of a Requirements Evaluation Team for development of Top Level Requirements and performance of initial ship feasibility studies is planned.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023
Congressional Add: Preliminary ship design of next-gen hospital ship	4.824	0.000
FY 2022 Accomplishments: FY 2022 funded requirements development via a Requirements Evaluation Team (RET), as well as, conduct of feasibility studies with Industry. Efforts include medical mission analysis and development, systems engineering, naval architecture and marine engineering in support of design development. Efforts will also support future Analysis of Alternatives.		
FY 2023 Plans: There is currently no additional funding planned in FY2023.		
Congressional Adds Subtotals	4.824	0.000

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies					Project (Number/Name) 9999 / Congressional Adds				
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Feasibility Studies	Various	Various : Various	0.000	2.824	Nov 2022	0.000		0.000		-		0.000	0.000	2.824	-
Subtotal			0.000	2.824		0.000		0.000		-		0.000	0.000	2.824	N/A
Remarks C754: Feasibility Studies awarded to industry partners.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SCS / BI PARM Analysis	IA	GSA : Illinois	8.700	0.000		0.000		0.000		-		0.000	0.000	8.700	-
SCS / BI PARM Analysis	WR	NSWC : TBD	1.300	0.000		0.000		0.000		-		0.000	0.000	1.300	-
PM & Engineering Support	Various	various : various	0.000	1.000	Apr 2022	0.000		0.000		-		0.000	0.000	1.000	-
Technical Support	Various	various : various	0.000	1.000	Apr 2022	0.000		0.000		-		0.000	0.000	1.000	-
Subtotal			10.000	2.000		0.000		0.000		-		0.000	0.000	12.000	N/A
Remarks C754: Feasibility Studies Analysis and requirements development PM/Technical and Engineering support.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			10.000	4.824		0.000		0.000		-		0.000	0.000	14.824	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy												Date: March 2023																
Appropriation/Budget Activity 1319 / 4												R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies								Project (Number/Name) 9999 / Congressional Adds								
Preliminary Ship Design of Next-Gen Hospital Ship	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603564N / Ship Prel Design & Feasibility Studies	Project (Number/Name) 9999 / Congressional Adds	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Preliminary Ship Design of Next-Gen Hospital Ship</i>				
Feasibility Studies	4	2022	4	2023
Warfare Center Analysis	3	2022	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603570N / Advanced Nuclear Power Systems
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	203.572	227.400	319.656	-	319.656	368.041	383.876	392.463	591.391	Continuing	Continuing
1258: Nuclear Technology Development	0.000	75.283	77.614	82.112	-	82.112	85.517	87.857	90.793	93.433	Continuing	Continuing
2370: Next Generation Fast Attack Nuclear Propulsion Development	0.000	68.147	93.079	183.144	-	183.144	238.139	256.846	265.836	461.736	Continuing	Continuing
3219: SBSD Nuclear Technology Development	0.000	60.142	56.707	54.400	-	54.400	44.385	39.173	35.834	36.222	Continuing	Continuing

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 444

A. Mission Description and Budget Item Justification

The details of this program element are classified CONFIDENTIAL and are submitted annually to Congress in the classified budget justification books.

<u>B. Program Change Summary (\$ in Millions)</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>
Previous President's Budget	203.572	227.400	316.612	-	316.612
Current President's Budget	203.572	227.400	319.656	-	319.656
Total Adjustments	0.000	0.000	3.044	-	3.044
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	3.044	-	3.044

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603570N / Advanced Nuclear Power Systems				Project (Number/Name) 1258 / Nuclear Technology Development			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
1258: Nuclear Technology Development	0.000	75.283	77.614	82.112	-	82.112	85.517	87.857	90.793	93.433	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The details of this program element are classified CONFIDENTIAL and are submitted annually to Congress in the classified budget justification books.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603570N / Advanced Nuclear Power Systems				Project (Number/Name) 2370 / Next Generation Fast Attack Nuclear Propulsion Development			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2370: Next Generation Fast Attack Nuclear Propulsion Development	0.000	68.147	93.079	183.144	-	183.144	238.139	256.846	265.836	461.736	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The details of this program element are classified CONFIDENTIAL and are submitted annually to Congress in the classified budget justification books.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603570N / Advanced Nuclear Power Systems				Project (Number/Name) 3219 / SBSD Nuclear Technology Development			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3219: SBSD Nuclear Technology Development	0.000	60.142	56.707	54.400	-	54.400	44.385	39.173	35.834	36.222	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 444												

A. Mission Description and Budget Item Justification

The details of this program element are classified CONFIDENTIAL and are submitted annually to Congress in the classified budget justification books.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	PE 0603573N / <i>Advanced Surface Machinery Sys</i>											
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	393.797	74.439	207.000	133.911	-	133.911	151.324	90.035	68.769	70.172	Continuing	Continuing
2471: <i>Integrated Power Systems (IPS)</i>	312.276	62.863	176.600	133.911	-	133.911	151.324	90.035	68.769	70.172	Continuing	Continuing
9999: <i>Congressional Adds</i>	81.521	11.576	30.400	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	123.497

A. Mission Description and Budget Item Justification

This Program Element (PE) supports innovative research and development of advanced surface ship Hull, Mechanical, and Electrical (HM&E) components and systems, primarily power and energy systems, and the subsequent test, evaluation, and demonstration of those systems for future ships and back-fit ships, where appropriate. This PE provides resources for Ships HM&E cyber analysis. This PE also serves as the bridge for power and energy systems between Science and Technology (S&T), ship platform, and mission systems acquisition programs by identifying prospective applications for S&T research, advanced development, and performing additional product development and qualification when necessary to meet platform or mission system requirements. This PE includes risk mitigation efforts for the DDG(X) Integrated Power System (IPS) which will satisfy the FY20 National Defense Authorization Act (NDAA) Section 131 requirements for land-based testing of propulsion systems in a realistic environment and FY22 NDAA Section 221 requirement for a land based test program for the engineering plant prior to DDG(X) construction start. The IPS hardware development and procurement and Land Based Test Site (LBTS) integration and test efforts executed under this PE / PU are informed by DDG (X) Ship Design specifications developed under PE 0603564N / PU 0411.

Lower funding requirements in FY 2024 is due to completed procurements of lead-time hardware for DDG(X) Integrated Power System (IPS) Land Based Test Site (LBTS) and an increase in enacted funding levels in FY23.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	76.922	176.600	150.880	-	150.880
Current President's Budget	74.439	207.000	133.911	-	133.911
Total Adjustments	-2.483	30.400	-16.969	-	-16.969
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	30.400			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.483	0.000			
• Program Adjustments	0.000	0.000	-17.948	-	-17.948
• Rate/Misc Adjustments	0.000	0.000	0.979	-	0.979

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023	
Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 0603573N / <i>Advanced Surface Machinery Sys</i>	
Congressional Add Details (\$ in Millions, and Includes General Reductions)		FY 2022	FY 2023
Project: 9999: <i>Congressional Adds</i>			
Congressional Add: <i>Silicon Carbide Power Modules</i>		9.647	0.000
Congressional Add: <i>Solid state circuit breaker development</i>		1.929	0.000
Congressional Add: <i>Silicon carbide flexible bus node</i>		0.000	21.400
Congressional Add: <i>Large format lithium ion batteries</i>		0.000	9.000
Congressional Add Subtotals for Project: 9999		11.576	30.400
Congressional Add Totals for all Projects		11.576	30.400
<u>Change Summary Explanation</u> FY 2023 to FY 2024 decreased by (-73.089) million of which (-\$30.400) million is due to FY23 Congressional Adds, as well as the following decreases to PU 2471/ Integrated Power Systems budget: (-\$32.741M) due primarily to DDG(X) Integrated Power System (IPS) Land Based Test Site (LBTS) progressing through long lead time hardware procurements; (-\$3.638M) is associated with delivery of the EM-P unit in FY23 and completion of government testing in FY24 and; (-\$ 6.310M) due to realignment of SABER development funds to the SABER program office PE 0603563N project 3244.			
R-4 Schedule update for HM&E Cyber Analysis. Efforts that remain in this PE are as needed Tabletop exercises that do not have specific milestones.			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603573N / Advanced Surface Machinery Sys				Project (Number/Name) 2471 / Integrated Power Systems (IPS)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2471: Integrated Power Systems (IPS)	312.276	62.863	176.600	133.911	-	133.911	151.324	90.035	68.769	70.172	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project Unit includes the development and risk reduction of advanced surface ship Hull, Mechanical, and Electrical (HM&E) components and systems, primarily power and energy systems, for all future ships and back-fit ships where appropriate as well as HM&E cyber security. Specific sub-projects include:

The DDG(X) power and propulsion risk mitigation demonstration sub-project will be used to de-risk the DDG(X) Integrated Power System (IPS) and satisfy the FY 2020 National Defense Authorization Act (NDAA) Section 131 requirements for land-based testing of propulsion systems in a realistic environment and FY 2022 NDAA Section 221 requirement for a land based test program for the engineering plant prior to DDG(X) construction start. In an IPS, all engines generate electric power, which can then be distributed to both the propulsion system and the ship's service electrical systems (radars and sensors, weapons systems, etc.). This flexibility allows the same propulsion and electric plant requirements to be met with fewer total engines. With an IPS, the most efficient combination of engines (diesel or gas turbine) can be placed online to supply the total electric power required for the combined propulsion and ship's service loads, which provides for greater fuel efficiency in comparison to a mechanically driven ship propulsion system. In comparison to a mechanically driven ship propulsion system (DDG 51), the DDG (X) IPS facilitates a 50% increase in range, 25% increase in fuel efficiency, and 120% increase in Time on Station. The DDG(X) IPS hardware development and procurement and Land Based Test Site (LBTS) integration and test efforts executed under this PE / PU are informed by DDG (X) Ship Design specifications developed under PE 0603564N / PU 0411. IPS test findings will inform decisions in baseline specifications and design products, developed under PE 0603564N / PU 0411, ensuring that the ship can accommodate the space, weight, power, cooling (SWAP-C) required by the IPS and that the IPS can meet DDG(X) power and energy requirements. The interdependency of DDG(X) design and IPS risk reduction is critical. This subproject will employ a four-phased testing and risk reduction approach (updated to align with FY 2020 and FY 2022 NDAA land based testing requirements) to build assurance that the DDG(X) IPS system can be installed and activated efficiently by the shipbuilder with performance characteristics that are well understood.

- Phase 1 (IPS Modeling & Simulation (M&S)), commenced in FY 2021, establishes a description of the components and system non-real-time models that are needed for the DDG(X) IPS digital engineering effort to provide performance feedback to DDG(X) IPS design and specification. Persistent digital engineering efforts initiated as part of Phase 1 extend through the life of the DDG(X) program.
- Phase 2 (Land Based Test Site), commenced in FY 2021, initially employs refined digital models and scaled integrated surrogate components that functionally represent the intended DDG(X) IPS and transitions to full scale testing by procurement, integration and test of DDG(X) specific major long lead hardware components.
- Phase 3 (Land Based Engineering Site) builds a tactical representation of the DDG(X) shipboard power and propulsion system based on the DDG(X) full scale hardware procured in phase 2. The LBES will be an enduring activity over the life of the ship and provides capability to perform performance & endurance testing of the IPS.
- Phase 4 (Shipboard Test & Activation), funded by future DDG(X) Shipbuilding and Conversion, Navy (SCN), conducts shipboard integration testing of the power and propulsion system with other ship systems to confirm performance as specified in the contract requirements and interoperability at the platform level.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023				
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603573N / Advanced Surface Machinery Sys	Project (Number/Name) 2471 / Integrated Power Systems (IPS)				
<p>Naval Power and Energy Systems developments and transitions including power generation, power conversion, power distribution, energy storage, power utilization and automation and control functions for fully integrated electric propulsion (such as T-AKE -1 class or DDG 1000 class), hybrid electric propulsion (such as LHD 8 and LHA(R) class), as well as legacy mechanical propulsion ships (such as DDG 51 class). Naval Power and Energy Systems sub-project supports optimized integration of naval warship power and energy systems to support Directed Energy (DE) and other high powered mission systems, ship power quality requirements including frequency and voltage control for AC systems, Directed Energy (DE) and other high powered mission systems, appropriate component and system controls, integration of components and systems into future and current ships, and providing power and energy system solution alternatives to new and existing platforms. Existing ships' power systems require optimized integration via energy storage and advanced controls techniques to withstand the effects of DE and other high powered mission systems and avoid negative impacts to power generating equipment (diesel/gas turbine engines and generators).</p> <p>- Power & Energy System developments are aligned with the Navy's 30 year shipbuilding plan and the Chief of Naval Operations Surface Capability Evolution Plan via the Naval Power and Energy Systems Technology Development Roadmap (TDR), which outlines the way ahead for future developments and provides a basis for coordinated planning and investment by the Navy and private industry.</p> <p>- The power and energy systems developed by this Project are the power and energy foundation of the ships kill chain, and are developed with efficiency requirements as part of total life cycle cost minimization. Efforts within Power and Energy Systems are to design, develop, test and integrate shipboard power systems to incorporate advanced sensors, directed energy and other advanced weapons. Design and testing includes modeling and simulation, as well as land based testing, to reduce risk and demonstrate readiness for shipboard use.</p> <p>Ships HM&E Cyber analysis employs cyber analysis tools to identify potential vulnerabilities in ship-wide or HM&E enclave/system architectures, hardware components, and software for applicable surface ships; and, designs and tests cyber protections for applicable surface ship systems, enclaves, and platforms.</p>							
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: DDG (X) Power & Propulsion Risk Mitigation & Demonstration			28.213	145.758	113.325	0.000	113.325
Articles:			-	-	-	-	-
FY 2023 Plans: Continue DDG(X) power and propulsion risk reduction activities to meet intent of (NDAA) Section 131 and FY22 NDAA Section 221 requirements for land-based testing of propulsion systems in a realistic environment aligned with the DDG(X) IPS design efforts as part of DDG(X) Design Development efforts executed under PE 0603564N/0411. Specifically: - Phase 1 (IPS M&S): Continue risk reduction activities for the DDG(X) IPS by utilizing ship power systems simulation at Florida State University Center for Advanced Power Systems (FSU CAPS) & Naval Surface Warfare Center Philadelphia Division (NSWCPD) to support equipment and interface specification refinement. Conduct real-time integrated system modeling (including controls) assessing power & propulsion system performance. Provide DDG(X) IPS design performance feedback to the ship design (PE 0603564N / PU 0411) as part of preliminary design and refinement of the power and propulsion system design and specification.							

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603573N / <i>Advanced Surface Machine ry Sys</i>	Project (Number/Name) 2471 / <i>Integrated Power Systems (IPS)</i>	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Demonstrate interfaces for energy storage and advanced controls capabilities that are required to support future mission system capabilities such as directed energy weapons and advanced sensors. Continue to gather and/or generate models to support DDG(X) IPS design decisions, known risk mitigations, and a digital model of IPS.</p> <p>- Phase 2 (Land Based Test Site): Commence scaled risk reduction testing and begin test site modifications and construction for full scale hardware. Initiate Shipbuilder procurement of long lead (36+ month) full scale DDG(X) representative hardware for IPS components including a propulsion motor & drive, primary & auxiliary power generators, electrical distribution, IPS controls, auxiliary systems, etc. In addition, commence procurement of LBTS facility long lead equipment including a propulsion load machine, load banks, and other hardware need to host full scale ship IPS. Continue refinement of interfaces and specifications for individual power and propulsion system components and validation of Digital Engineering efforts.</p> <p>- Phase 3 (Land Based Engineering Site): Initiate design for the DDG(X) IPS LBES which transitions from the LBTS to tactical representation of the DDG(X) shipboard power and propulsion system.</p> <p><i>FY 2024 Base Plans:</i></p> <p>Continue DDG(X) power and propulsion risk reduction activities to meet intent of (NDAA) Section 131 and FY22 NDAA Section 221 requirements for land-based testing of propulsion systems in a realistic environment aligned with the DDG(X) IPS design efforts as part of DDG(X) Design Development efforts executed under PE 0603564N/0411. Specifically:</p> <p>- Phase 1 (IPS M&S): Continue risk reduction activities for the DDG(X) IPS by utilizing ship power systems simulation at Florida State University Center for Advanced Power Systems (FSU CAPS) & Naval Surface Warfare Center Philadelphia Division (NSWCPD) to support equipment and interface specification refinement. Conduct real-time integrated system modeling (including controls) assessing power & propulsion system performance. Provide DDG(X) IPS design performance feedback to the ship design (PE 0603564N / PU 0411) as part of preliminary design and refinement of the power and propulsion system design and specification. Demonstrate interfaces for energy storage and advanced controls capabilities that are required to support future mission system capabilities such as directed energy weapons and advanced sensors.</p> <p>- Phase 2 (Land Based Test Site): Continue risk reduction testing and test site modifications and construction for incorporation of DDG(X) IPS hardware. Continue Shipbuilder procurement of DDG(X) IPS hardware components including a propulsion motor & drive, primary & auxiliary power generators, electrical distribution, IPS controls, auxiliary systems, etc. Continue refinement of interfaces and specifications for individual power and propulsion system components and validation of Digital Engineering efforts.</p>					

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Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603573N / Advanced Surface Machinery Sys		Project (Number/Name) 2471 / Integrated Power Systems (IPS)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Phase 3 (Land Based Engineering Site): Continue design for the DDG(X) IPS LBES which transitions from the LBTS to tactical representation of the DDG(X) shipboard power and propulsion system.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: FY 2023 to FY 2024 decrease of (-\$32.741M) is due primarily to DDG(X) Integrated Power System (IPS) Land Based Test Site (LBTS) progressing through long lead time hardware procurements. LBTS infrastructure Refurbishments and IPS procurement activities continue in FY 2024.</p>						
<p>Title: Power and Energy Systems</p> <p>Articles:</p> <p>FY 2023 Plans: Energy storage, referred to as Energy Magazine, required to avoid negative impacts of Directed Energy (DE) weapons and other high powered mission systems on power generating equipment (diesel/gas turbine engines and generators) and ship electrical distribution systems. There are two (2) ongoing energy storage developments: Energy Magazine Prototype (EM-P) focused specifically on laser application, the most challenging power pulse to interface, and will result in a prototype demonstration unit. EM-P will inform the Energy Magazine which is a common, modular, scalable intermediate power system that standardizes energy storage across multiple mission systems (lasers, advanced radars, Surface Electronic Warfare Improvement Program (SEWIP), and other pulsed loads) and ships classes, and eliminates wasteful need for mission systems to each develop, build, test, qualify/certify and support their own unique energy storage systems. The Energy Magazine also provides stable backup power functionality and leads to reduction of uninterruptable power supplies (UPS) aboard ship. Energy Magazine is designed for both new construction and back-fit applications where advanced combat systems are being deployed.</p> <p>Energy Magazine-Prototype (EM-P): Complete preparation of test plans and procedures and test site modifications for independent government testing. Complete confirmation of safety of lithium-battery energy storage system design through rigorous safety and characterization testing. Complete factory testing and deliver, install, and test EM-P hardware in the FSU CAPS M&S environment against representative naval</p>		25.852 -	21.883 -	17.937 -	0.000 -	17.937 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603573N / Advanced Surface Machine ry Sys	Project (Number/Name) 2471 / Integrated Power Systems (IPS)	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>warship electrical architectures and relevant directed energy weapon systems loads followed by installation and independent government testing to confirm performance requirements against representative Naval power system and validate digital models of the EM-P system. Continue to support PEO IWS, Office of the Chief of Naval Operations, (OPNAV), and Office of Naval Research (ONR) laser testing and planning activities. Evaluate performance of the EM prototype and, as applicable, incorporate lessons learned in EM.</p> <p>Energy Magazine (EM): Complete System and Software Requirements Review and initiate preliminary design. Complete preliminary design, hold Preliminary Design Review and commence detail design, characterization for Lithium Ion (Li) Batteries, build of prototype energy storage units, conduct Test Readiness Reviews and start energy storage testing required by NAVSEAINST 9310.1. Accept delivery of EM models and conduct component and system simulations that focus on EM software development and EM performance. Generate and validate detailed interface requirements, test plans and procedures for use in virtual environment demonstration(s) and independent government testing to confirm performance requirements.</p> <p>Continue transition of the Robust Combat Power Control (RCPC) Future Naval Capabilities (FNC), SW-FY-20-02, in accordance with the Technology Deployment Agreement with the Office of Naval Research. The RCPC FNC enables Tactical Energy Management by developing Integrated Power System (IPS) control algorithms facilitating flexible power distribution and management. This capability also gives an IPS the ability to readily incorporate energy storage (Energy Magazine) in the future becoming an Integrated Power & Energy system (IPES). An IPES as described in the Naval Power and Energy Systems Technology Development Roadmap (NPES TDR) is an advanced power architecture that incorporates multi-use distributed energy storage (Energy Magazine) and advanced controls (RCPC) to effect ship wide energy management. IPES fully integrates and controls all generated and stored electrical energy in the ship platform so that it is available to all electrical users, in the most fuel efficient manner possible, including high power weapons, advanced sensors, and electric propulsion, as mission scenarios dictate.</p>					

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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603573N / Advanced Surface Machine ry Sys	Project (Number/Name) 2471 / Integrated Power Systems (IPS)	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Advanced Power Conversion Module (APCM) required to develop power conversion equipment to support high powered future ship equipment requirements Continue to support ONR Silicon Carbon (and other high bandgap semiconductor materials) based power electronic modules that enable more compact, thermally tolerant power conversion equipment making them highly desirable for naval applications.</p> <p>Advanced Power Generation Modules (APGM) ongoing developments lower Total Ownership Cost (TOC) by developing advanced materials package capable of minimum 3X engine life over projected increases in Gas Turbine (GT) loads and temperatures: The transitioned ONR FNC SW-19-03 (GT Marinization Package), planned FY 2023 focus areas include evaluation of ONR sponsored 264-hr 501-K34 engine endurance test and post-test engine teardown and inspection to support prototype parts selection and integration into a Fleet engine asset for planned At-Sea evaluation. Initiate production engineering tasks including development of material and coating product specifications and casting and tooling manufacturing processes.</p> <p>The below tasks, previously executed within the Naval Power Technology Development / Platform Integration & Transition subprojects, are now included within the Power & Energy Systems subproject to better align tasks.</p> <ul style="list-style-type: none"> - Continue to execute International Agreements with the United Kingdom, India, Germany, and Japan for power and propulsion. Specific agreements include: Project Arrangement (PA) ref DoD-MOD-N-12-0001 between the United States (US) and United Kingdom (UK) Governments to cooperate on a scope of work associated with characterizing, developing, modeling, and de-risking electrical power and propulsion system architectures and equipment for future surface and submarine platforms to meet the needs of both Navies. German (N-13-GY-4246), Indian (N-20-IND-6625) and Japanese (N-20-JPN-4037) Navies. Continue to execute In-Service agreement with United Kingdom on all matters related to naval warship power, energy and propulsion systems. - Continue to support maturation and transition of ONR Future Naval Capabilities (FNC) products to meet NPES TDR 					

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
identified gaps. Continue update of the Naval Power and Energy Systems (NPES) Technology Development Roadmap (TDR) and, when ready, issue update of the NPES TDR. FY 2024 Base Plans: Energy storage, referred to as Energy Magazine, is required to avoid negative impacts of Directed Energy (DE) weapons and other high powered mission systems on power generating equipment (diesel/gas turbine engines and generators) and ship electrical distribution systems. The Energy Magazine is a common, modular, scalable intermediate power system that standardizes energy storage across multiple mission systems (lasers, advanced radars, Surface Electronic Warfare Improvement Program (SEWIP), and other pulsed loads) and ships classes, and eliminates wasteful need for mission systems to each develop, build, test, qualify/certify and support their own unique energy storage systems. The Energy Magazine (EM) also provides stable backup power functionality and leads to reduction of uninterruptable power supplies (UPS) aboard ship. Energy Magazine is designed for both new construction and back-fit applications where advanced combat systems are being deployed. Energy Magazine-Prototype (EM-P): Conduct testing of EM-P hardware in the FSU CAPS M&S environment against representative naval warship electrical architectures and relevant directed energy weapon systems loads and independent government testing to confirm performance requirements against representative Naval power system and validate digital models of the EM-P system. Evaluate performance of the EM prototype and, as applicable, incorporate lessons learned in EM. EM-P activities are planned to complete in FY24. Continue to support PEO IWS, OPNAV, and ONR laser integration demonstration(s). Energy Magazine (EM): Complete the detail design, characterization for Lithium Ion (Li) Batteries, procurement of all material to fabricate and assemble EM first units, conduct Test Readiness Reviews and continue and complete testing. Continue to update EM models and conduct component and system simulations that focus on EM software development and EM performance. Generate and validate detailed interface requirements, test plans and procedures for use in virtual environment demonstration(s) and independent government testing to confirm performance requirements. Continue to support PEO IWS, Office of the Chief of Naval Operations, and Office of Naval Research laser testing and planning activities. Evaluate performance of the EM prototype and, as applicable, incorporate lessons learned in EM.						

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Continue transition of the Robust Combat Power Control (RCPC) Future Naval Capabilities (FNC), SW-FY-20-02, in accordance with the Technology Deployment Agreement with the Office of Naval Research. The RCPC FNC enables Tactical Energy Management by developing Integrated Power System (IPS) control algorithms facilitating flexible power distribution and management. This capability also gives an IPS the ability to readily incorporate energy storage (Energy Magazine) in the future becoming an Integrated Power & Energy system (IPS). An IPES as described in the Naval Power and Energy Systems Technology Development Roadmap (NPES TDR) is an advanced power architecture that incorporates multi-use distributed energy storage (Energy Magazine) and advanced controls (RCPC) to effect ship wide energy management. IPES fully integrates and controls all generated and stored electrical energy in the ship platform so that it is available to all electrical users, in the most fuel-efficient manner possible, including high power weapons, advanced sensors, and electric propulsion, as mission scenarios dictate.</p> <p>Develop an Advanced Power Conversion Module (APCM) to convert ships power for use by high powered future ship equipment with different voltage requirements, such as radars, sensors, etc. Utilize Silicon Carbon (and other high bandgap semiconductor materials) power electronic modules that enable more compact, thermally tolerant power conversion equipment making them highly desirable for naval applications. FY24 will complete requirements definition begun in FY23, and develop solicitation products (RFP, selection plan, etc.) for development and procurement of an APCM.</p> <p>Advanced Power Generation Modules (APGM): Ongoing developments lower Total Ownership Cost (TOC) by developing advanced materials package capable of minimum 3X engine life over projected increases in Gas Turbine (GT) loads and temperatures: The transitioned ONR FNC SW-19-03 (GT Marinization Package), planned FY 2024 focus areas include completion of material/coating production specifications, completion of casting/coating manufacturing process development, initiation of parts fabrication for qualification testing, and monitoring condition of at-sea demonstration hardware.</p> <p>Naval Power Technology Development / Platform Integration & Transition: Continue to execute International Agreements with the United Kingdom, India, Germany, and Japan for power and propulsion. Specific agreements include: Project Arrangement (PA) ref DoD-MOD-N-12-0001 between the United States (US) and UK Governments to cooperate on a scope of work associated with characterizing, developing, modeling, and de-risking electrical power and propulsion system architectures and equipment for future surface and submarine platforms to meet</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023				
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603573N / Advanced Surface Machinery Sys	Project (Number/Name) 2471 / Integrated Power Systems (IPS)				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
the needs of both Navies. German (N-13-GY-4246), Indian (N-20-IND-6625) and Japanese (N-20-JPN-4037) Navies. Continue to execute In-Service agreement with United Kingdom (UK) on all matters related to naval warship power, energy and propulsion systems. Continue to support maturation and transition of ONR Future Naval Capabilities (FNC) products to meet NPES TDR identified gaps. Continue update of the Naval Power and Energy Systems (NPES) Technology Development Roadmap (TDR) and, when ready, issue update of the NPES TDR. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Decrease of (-\$3.638M) is associated with delivery of the EM-P unit in FY23 and completion of government testing in FY24							
Title: HM&E Cyber Analysis Articles: Description: Previous titled: HM&E Cybersecurity - Hardware Development / Prototyping & Cyber Analysis FY 2023 Plans: Continue build of Hull, Mechanical, and Electrical (HM&E) cybersecurity computing hardware Lab units for NSWC Philadelphia Division, Philadelphia PA for ship integration testing to support installations in FY 2024 and FY 2025. Begin design and development of second generation Situational Boundary Enforcement & Response (SABER) Computing Hardware. Continue development and testing of additional WeaselBoard variants as well as existing variants for additional ship classes. Complete verification and validation testing of Copper Tap & Aggregator HW unit. Conduct Cyber Table Top type events and cyber vulnerability analysis via Model Based Systems Engineering tools of HM&E systems/networks on additional ship classes. FY 2024 Base Plans: Conduct Cyber Table Top type events and cyber vulnerability analysis via Model Based Systems Engineering tools of HM&E systems/networks on additional ship classes. FY 2024 OCO Plans:			8.798 -	8.959 -	2.649 -	0.000 -	2.649 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603573N / <i>Advanced Surface Machinery Sys</i>		Project (Number/Name) 2471 / <i>Integrated Power Systems (IPS)</i>		
<u>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</u>						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
<i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> The decrease of (\$-6.310M) from FY23 to FY24 is due to realignment of SABER development funds to the SABER program office PE 0603563N project 3244.						
Accomplishments/Planned Programs Subtotals		62.863	176.600	133.911	0.000	133.911
<u>C. Other Program Funding Summary (\$ in Millions)</u> N/A						
<u>Remarks</u>						
<u>D. Acquisition Strategy</u> For new contract awards, full and open competition is utilized to the maximum extent possible to provide maximum benefit to the Navy at the lowest possible cost to the taxpayer. When able to meet Navy requirements, commercial technology is leveraged to further minimize cost to the Navy.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603573N / Advanced Surface Machine ry Sys				Project (Number/Name) 2471 / Integrated Power Systems (IPS)					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Power & Energy Sys	SS/CPFF	Rolls Royce : Walpole, MA	37.983	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Power & Energy Sys	C/CPIF	DRS : Milwaukee WI	0.500	10.200	Apr 2022	7.919	Nov 2022	7.023	Nov 2023	-		7.023	Continuing	Continuing	Continuing
Power & Energy Sys	C/CPFF	DRS : DRS, Milwaukee WI	71.790	6.733	Oct 2021	2.954	Nov 2022	0.065	Nov 2023	-		0.065	Continuing	Continuing	Continuing
Power & Energy Sys	C/CPFF	Industry : Various	57.683	2.717	Nov 2021	4.488	Nov 2022	4.388	Nov 2023	-		4.388	Continuing	Continuing	Continuing
Power & Energy Sys	WR	NSWCPD : Phila, PA	69.138	1.445	Nov 2021	2.514	Nov 2022	2.700	Nov 2023	-		2.700	Continuing	Continuing	Continuing
Power & Energy Sys	WR	Other Government Organizations : Various	1.799	2.288	Nov 2021	2.180	Nov 2022	2.194	Nov 2023	-		2.194	Continuing	Continuing	Continuing
Cyber analysis	WR	NSWCPD : Phila, PA	16.800	1.403	Nov 2021	2.182	Nov 2022	0.946	Nov 2023	-		0.946	Continuing	Continuing	Continuing
Cyber analysis	C/CPIF	Boeing : Huntington Beach, CA	1.750	0.250	May 2022	0.800	May 2023	0.000	May 2024	-		0.000	Continuing	Continuing	Continuing
Cyber analysis	C/FP	Various HM&E Equipment Vendors : Various	2.066	0.000	Apr 2022	1.633	Jan 2023	0.320	Jan 2024	-		0.320	Continuing	Continuing	Continuing
Cyber analysis	C/CPIF	Industry : Various	4.779	0.623	Apr 2022	0.309	Jan 2023	0.383	Jan 2024	-		0.383	Continuing	Continuing	Continuing
Cyber analysis	C/CPFF	Hexagon US Federal : Huntsville, AL	1.374	2.732	Apr 2022	1.082	Jan 2023	0.000	Jan 2024	-		0.000	Continuing	Continuing	Continuing
Cyber analysis	C/CPFF	JHU APL : Laurel, MD	5.405	1.800	Jan 2022	2.528	Nov 2022	1.000	Nov 2023	-		1.000	Continuing	Continuing	Continuing
Cyber analysis	C/CPFF	Visionary Products Incorporated (VPI) Technologies : Draper, UT	1.671	0.690	Jul 2022	0.075	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Cyber analysis	MIPR	Sandia National Labs : Albuquerque, NM	5.213	1.300	Nov 2021	0.350	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
DDG(X) Power & Prop Risk Mitigation & Demo	WR	Other Government Organizations : Various	0.000	0.000	Mar 2022	0.914	Nov 2022	1.064	Nov 2023	-		1.064	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603573N / Advanced Surface Machinery Sys				Project (Number/Name) 2471 / Integrated Power Systems (IPS)					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
DDG(X) Power & Prop Risk Mitigation & Demo	Various	GE : Various	0.000	0.200	Feb 2022	16.539	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing
DDG(X) Power & Prop Risk Mitigation & Demo	C/CPFF	Industry : Various	0.000	18.974	Nov 2021	66.373	Nov 2022	56.484	Nov 2023	-		56.484	0.000	141.831	-
DDG(X) Power & Prop Risk Mitigation	WR	NSWCPD : Phila. PA	0.000	6.324	Dec 2021	8.641	Nov 2022	8.740	Nov 2023	-		8.740	0.000	23.705	-
DDG(X) Power & Prop Risk Mitigation	Various	Shipbuilders (BIW/HII) : Various	0.000	2.715	Jan 2022	53.291	Nov 2022	46.729	Nov 2023	-		46.729	0.000	102.735	-
Subtotal			277.951	60.394		174.772		132.036		-		132.036	Continuing	Continuing	N/A
Remarks															
FY 2023 to FY 2024 decrease in Product Development is due primarily to DDG(X) Integrated Power System (IPS) Land Based Test Site (LBTS) sequenced long lead time hardware procurements. LBTS infrastructure refurbishments and IPS procurement activities continue in FY 2024.															
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWCCD-SSES : Phila, PA	24.954	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			24.954	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Management	C/CPFF	Herren Associates : Alexandria, VA	9.371	2.469	Oct 2021	1.828	Nov 2022	1.875	Nov 2023	-		1.875	Continuing	Continuing	Continuing
Subtotal			9.371	2.469		1.828		1.875		-		1.875	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023				
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603573N / Advanced Surface Machine ry Sys					Project (Number/Name) 2471 / Integrated Power Systems (IPS)					
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			312.276	62.863		176.600		133.911		-		133.911	Continuing	Continuing	N/A

Remarks

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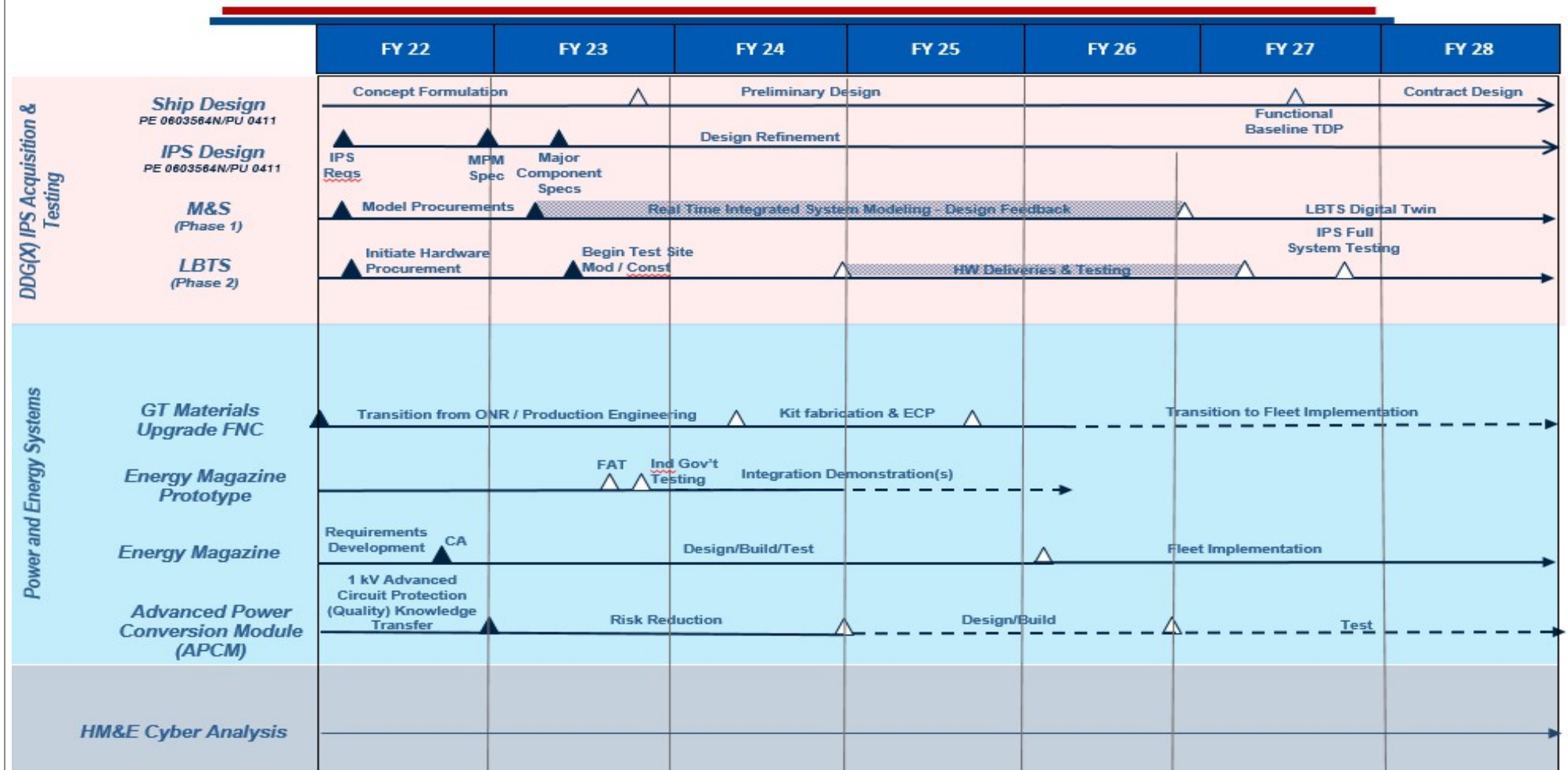
Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0603573N / Advanced Surface Machinery Sys

Project (Number/Name)
2471 / Integrated Power Systems (IPS)



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603573N / Advanced Surface Machinery Sys	Project (Number/Name) 2471 / Integrated Power Systems (IPS)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2471				
DDG(X) Power & Propulsion Risk Mitigation & Demo / DDG(X) IPS ACQ & Testing	1	2022	4	2028
Power and Energy Systems	1	2022	4	2028
HM&E Cyber Security	1	2022	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603573N / Advanced Surface Machine ry Sys				Project (Number/Name) 9999 / Congressional Adds			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: Congressional Adds	81.521	11.576	30.400	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	123.497
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Congressional Adds:
 Silicon Carbide Power Modules (C447)
 Solid State Circuit Breaker Development (C755)

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023
Congressional Add: Silicon Carbide Power Modules	9.647	0.000
FY 2022 Accomplishments: Continue Silicon Carbide (SiC) power module efforts including development, qualification, and systems integration. Specific efforts include SiC semiconductor module refinement and validation, endurance test and prototype power converter development, modeling, prototype power converter testing, etc.		
FY 2023 Plans: Continue Silicon Carbide (SiC) power module efforts including development, qualification, and systems integration. Specific efforts include SiC semiconductor module refinement and validation, endurance test and prototype power converter development, modeling, prototype power converter testing, etc.		
Congressional Add: Solid state circuit breaker development	1.929	0.000
FY 2022 Accomplishments: Develop contracting strategy and scope of effort associated with Solid State Circuit Breaker Development		
FY 2023 Plans: Award contract and execute scope associated with Solid State Circuit Breaker Development		
Congressional Add: Silicon carbide flexible bus node	0.000	21.400
FY 2022 Accomplishments: N/A		
FY 2023 Plans: Develop contracting strategy and execute scope associated with Silicon carbide flexible bus node		
Congressional Add: Large format lithium ion batteries	0.000	9.000

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603573N / Advanced Surface Machinery Sys	Project (Number/Name) 9999 / Congressional Adds	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023
FY 2022 Accomplishments: N/A			
FY 2023 Plans: Develop contracting strategy and scope of effort associated with Large format lithium ion batteries			
Congressional Adds Subtotals		11.576	30.400
C. Other Program Funding Summary (\$ in Millions)			
N/A			
Remarks			
D. Acquisition Strategy			
N/A			

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603573N / Advanced Surface Machinery Sys				Project (Number/Name) 9999 / Congressional Adds					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SiC Power Modules	C/CPFF	RCT : Linthicum Heights MD	19.164	9.398	Sep 2022	0.000		0.000		-		0.000	0.000	28.562	-
SiC Power Modules	Various	Various : Various	2.060	0.250	Jun 2022	0.000		0.000		-		0.000	0.000	2.310	-
Adv. Power electronics Integration	Various	Various : Various	7.236	0.000		0.000		0.000		-		0.000	0.000	7.236	-
Surface Combatant Component Level prototyping	Various	Various : Various	9.361	0.000		0.000		0.000		-		0.000	0.000	9.361	-
Surface Combatant Component Level Prototyping	Various	General Electric : Various	17.818	0.000		0.000		0.000		-		0.000	0.000	17.818	-
Surface Combatant Component Level Prototyping	Various	Rolls-Royce : Various	4.480	0.000		0.000		0.000		-		0.000	0.000	4.480	-
Surface Combatant Component Level Prototyping	Various	FSU CAPS : Tallahassee, FL	10.800	0.000		0.000		0.000		-		0.000	0.000	10.800	-
Surface Combatant Component Level Prototyping	WR	NSWCPD : Philadelphia,PA	5.778	0.000		0.000		0.000		-		0.000	0.000	5.778	-
Small Boat Electric Propulsion	Various	Various : Various	4.824	0.000		0.000		0.000		-		0.000	0.000	4.824	-
Solid State Circuit Breaker Development	C/BA	Not Specified : Not Specified	0.000	1.928	Aug 2022	0.000		0.000		-		0.000	0.000	1.928	-
SiC FBN	C/BA	Not Specified : Not Specified	0.000	0.000		21.400	Jun 2023	0.000		-		0.000	0.000	21.400	-
Large Format Lithium ion battery	C/BA	Not Specified : Not Specified	0.000	0.000		9.000	Sep 2023	0.000		-		0.000	0.000	9.000	-
Subtotal			81.521	11.576		30.400		0.000		-		0.000	0.000	123.497	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023				
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603573N / Advanced Surface Machine ry Sys					Project (Number/Name) 9999 / Congressional Adds					
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			81.521	11.576		30.400		0.000		-		0.000	0.000	123.497	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																Date: March 2023			
Appropriation/Budget Activity								R-1 Program Element (Number/Name)								Project (Number/Name)			
1319 / 4								PE 0603573N / Advanced Surface Machinery Sys								9999 / Congressional Adds			

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 9999																												
SiC Power Modules																												
Solid State Circuit Breaker Development																												
SiC Flexible Bus Node																												
Large Format Lithium ion Batteries																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603573N / Advanced Surface Machinery Sys	Project (Number/Name) 9999 / Congressional Adds	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
SiC Power Modules	3	2022	4	2023
Solid State Circuit Breaker Development	3	2022	4	2023
SiC Flexible Bus Node	2	2023	4	2024
Large Format Lithium ion Batteries	2	2023	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	PE 0603576N / <i>CHALK EAGLE</i>											
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	76.723	91.280	116.078	-	116.078	137.369	186.873	214.743	205.038	Continuing	Continuing
1578: <i>Chalk Eagle</i>	0.000	76.723	91.280	116.078	-	116.078	137.369	186.873	214.743	205.038	Continuing	Continuing

A. Mission Description and Budget Item Justification

The details of this budget justification are classified, per Executive Order 13526, Sec 1.4 (a) and are submitted annually to Congress in the classified budget justification book.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	79.797	91.584	118.967	-	118.967
Current President's Budget	76.723	91.280	116.078	-	116.078
Total Adjustments	-3.074	-0.304	-2.889	-	-2.889
• Congressional General Reductions	-	-0.304			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.002	0.000			
• SBIR/STTR Transfer	-3.072	0.000			
• Rate/Misc Adjustments	0.000	0.000	-2.889	-	-2.889

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603581N / Littoral Combat Ship							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	1,446.434	80.254	76.364	32.615	-	32.615	70.361	67.297	62.064	63.185	Continuing	Continuing
3096: Littoral Combat Ship	1,383.541	74.882	74.966	31.688	-	31.688	69.419	66.370	61.156	62.259	Continuing	Continuing
4506: LCS Training	62.893	5.372	1.398	0.927	-	0.927	0.942	0.927	0.908	0.926	Continuing	Continuing
Program MDAP/MAIS Code: Project MDAP/MAIS Code(s): 374												

A. Mission Description and Budget Item Justification

The Littoral Combat Ship (LCS) Program Element (PE) provides funds for detailed design, development, construction, issue resolution, certification, integration, and testing of the Littoral Combat Ship (LCS). LCS operates with focused-Mission Packages that deploy manned and unmanned vehicles to execute a variety of missions, including, Surface Warfare (SUW) and Mine Countermeasures (MCM). LCS also possesses inherent capabilities, regardless of the Mission package installed, including intelligence/surveillance/reconnaissance (ISR), LCS SUW will also include Maritime Interdiction/interception Operations (MIO), Anti-Terrorism/Force Protection (AT/FP), air warfare self-defense, joint littoral mobility and logistic support for movement of personnel and supplies. This relatively small, shallow-draft, high-speed surface combatant complements the U.S. Navy's Surface Fleet by operating in environments where it is impossible or undesirable to employ larger, deeper-draft, multi-mission ships. LCS can deploy independently to overseas littoral regions or remain on station for extended periods of time either with a battle group or through a forward-basing arrangement. LCS will operate with Carrier Strike Groups, Surface Action Groups, or independently as dictated by the mission and environment. Additionally, LCS can operate cooperatively with the U.S. Coast Guard and Allies.

This PE also provides funds for the design, development, engineering, implementation, and testing of the combat system modifications for Lethality and Survivability (L&S) for both LCS variants (Independence and Freedom). The L&S upgrades include the development of a common Combat Management System (CMS) and integration and testing of government furnished systems including the Gun Weapon System (GWS), Electronic Warfare (EW) system and Decoy Launching System (DLS) for both LCS Class Variant ships.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0603581N / Littoral Combat Ship			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	82.518	96.444	43.574	-	43.574
Current President's Budget	80.254	76.364	32.615	-	32.615
Total Adjustments	-2.264	-20.080	-10.959	-	-10.959
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-20.080			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.264	0.000			
• Program Adjustments	0.000	0.000	-11.533	-	-11.533
• Rate/Misc Adjustments	0.000	0.000	0.574	-	0.574
Change Summary Explanation					
FY2024 funding request for project 3096 was decreased by \$10.851 for execution adjustments.					
FY2024 funding request was decreased by \$.108 rate/miscellaneous adjustments.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603581N / Littoral Combat Ship				Project (Number/Name) 3096 / Littoral Combat Ship			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3096: Littoral Combat Ship	1,383.541	74.882	74.966	31.688	-	31.688	69.419	66.370	61.156	62.259	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 374												

A. Mission Description and Budget Item Justification

The RDT&E portion of the LCS Program comprises design and development efforts required to field the LCS Class Ships, including integration with the Mission Packages (MCM and SUW) activities both pre- and post-delivery. It includes the design and development effort required to support the introduction and deployment of a Flight 0+ baseline (LCS 3/4 and Follow) with incorporation of lessons learned from the design and construction of USS FREEDOM (LCS 1) and USS INDEPENDENCE (LCS 2). Additionally, it includes design, development, issue resolution, certification and testing efforts required to support the design baseline for the six year block buy in FY10-15. This baseline includes lessons learned from the LCS 1 through LCS 4.

The LCS design and development phases include platform design and development, experimentation, ship system design and integration, hull platform testing, development of Technical Data Packages (TDPs), total ship system engineering and integration, combat systems and warfare systems certification, and planning and conduct of system testing. These efforts include procurement of combat and warfare system elements and/or simulators to support production representative testing in support of design, development, and certification efforts and ordnance in support of testing.

The RDT&E portion of LCS funding also comprises formal Developmental and Operational Assessment testing of the LCS Ships and Mission Packages. Test and Evaluation (T&E) will concentrate on verifying integration and interoperability of employed technologies and systems in the LCS seaframe designs and modular mission packages to achieve the mission capabilities and performance requirements as defined in the LCS program's Flight 0 and Flight 0+ Capabilities Development Documents (CDD). T&E functions will include the evaluation of Critical Technical Parameters (CTP), Measures of Effectiveness (MOE), Measures of Suitability (MOS), and Key Performance Parameters (KPP) for the core seaframe and the focused missions.

This budget provides funds for the design, development, engineering, implementation, and testing of the combat system modifications for Lethality and Survivability (L&S) for both LCS variants (Independence and Freedom). The L&S upgrades include the development of a common Combat Management System (CMS) and integration and testing of government furnished systems including the Gun Weapon System (GWS), Electronic Warfare (EW) system, and Decoy Launching System (DLS) for both LCS Class Variants (Independence and Freedom) ships. Without funding for L&S trainer upgrades, sailors on ships with L&S configuration will not be trained on the L&S configuration in our trainers.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: LCS Lethality and Survivability	74.882	74.966	31.688	0.000	31.688
Articles:	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603581N / <i>Littoral Combat Ship</i>	Project (Number/Name) 3096 / <i>Littoral Combat Ship</i>	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Description: Provides engineering support to develop a common combat management system, leveraging a common source library, for installation on both LCS variants (Independence and Freedom). The Combat Systems baseline will be compatible with Program of Record (PoR) combat systems replacing Contractor Furnished Equipment (CFE) and integrate Over the Horizon (OTH) missile system. Funding includes logistic product development, Engineering Change Proposals (ECPs), ship structural analysis, development of an integrated test plan and cyber analysis to accomplish Risk Management Framework authorization.</p> <p>FY 2023 Plans: Verification and testing for the first L&S Phase 1 installations in FY24. Initial L&S Phase 2 studies will be conducted analyzing enhanced fire control radar solution, potential mission package integration to the CMS, improved top-side radars, as well as enhanced lethality in support of Distributed Maritime Operations.</p> <p>FY 2024 Base Plans: Finalize verification and testing for the first L&S Phase 1 installations in FY24. Continue L&S Phase 2 studies for analysis of enhanced fire control radar solution, potential mission package integration to the CMS, improved top-side radars, as well as enhanced lethality in support of Distributed Maritime Operations.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The reduction in FY 2024 of \$43.359M delays the finalization of design and development efforts verification and testing of the Combat System baseline for L&S Phase 1 installations.</p>					
Accomplishments/Planned Programs Subtotals	74.882	74.966	31.688	0.000	31.688

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• SCN/2127: <i>LCS Ship</i>	44.860	67.801	23.000	-	23.000	0.000	0.000	0.000	0.000	0.000	16,865.635
• 1604: <i>LCS In-Service Modernization</i>	35.183	27.243	89.543	-	89.543	68.083	101.051	129.912	147.010	Continuing	Continuing

Remarks

BLI 1604 supports Lethality and Survivability efforts on the LCS Ships

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603581N / <i>Littoral Combat Ship</i>	Project (Number/Name) 3096 / <i>Littoral Combat Ship</i>
<p>D. Acquisition Strategy</p> <p>The LCS program takes an evolutionary approach to acquisition that emphasizes competition as a key to achieving affordability. Initially, two industry teams competed against each other with two distinctly different LCS designs. The decision produced two flights with a vessel from each design: Flight 0 (LCS 1 and LCS 2); and Flight 0+ (LCS 3 and out). The Flight 0+ baseline incorporates lessons learned from the design, construction, and testing of the Flight 0 ships. The Navy conducted a limited competition amongst the existing LCS industry teams or team participants for the award of a contract for the construction of a block buy of up to ten (10) LCS Flight 0+ Class ships, with an objective of competitively awarding a single contract to a single industry team.</p> <p>By Acquisition Decision Memorandum of December 23, 2010, the USD (AT&L) authorized execution of an alternative acquisition strategy for the FY 2010 through FY 2015 procurement of 20 seaframes through two ten-ship block buy contracts. On December 29, 2010, the Navy awarded two contracts for block buys of up to ten ships, beginning with the award to each contractor of one FY 2010 ship and associated non-recurring engineering, the development of the Technical Data Package (TDP), core class services, and associated data. This was followed by the contractual funding of one ship to each contractor in FY 2011 and two ships each funded in FY 2012 through FY 2014.</p> <p>On October 17, 2014 USD (AT&L) approved the Navy's plan to procure three ships in FY 2015 and three ships in FY 2016 by modifying the current block buy contracts. The modification to each of the block buy contracts completed the previously approved 20 ship block buy procurement and added options for two FY 2016 ships for a total of 26 LCS ships. The Navy's Acquisition strategy supported the procurement of three LCS ships in FY17, FY18, and FY19.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603581N / <i>Littoral Combat Ship</i>				Project (Number/Name) 3096 / <i>Littoral Combat Ship</i>					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
L&S Product Development	SS/CPIF	LM : Moorestown, NJ	12.850	48.012	Nov 2021	21.787	Oct 2022	10.000	Oct 2023	-		10.000	Continuing	Continuing	Continuing
Product Development Summary	Various	Various : Various	479.868	0.000		0.000		0.000		-		0.000	0.000	479.868	-
Subtotal			492.718	48.012		21.787		10.000		-		10.000	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NSWC/DD : Dahlgren, VA	76.963	0.000		0.000		0.000		-		0.000	0.000	76.963	-
Government Engineering Support	WR	NSWC/PC : Panama City, FL	27.987	0.000		0.000		0.000		-		0.000	0.000	27.987	-
Government Engineering Support	WR	NUWC/N : Newport, RI	10.424	0.000		0.000		0.000		-		0.000	0.000	10.424	-
Government Engineering Support	WR	NAWC/AD : Pax River, MD	25.062	0.000		0.000		0.000		-		0.000	0.000	25.062	-
Government Engineering Support	WR	NSWC/CR : Crane, IN	17.722	0.000		0.000		0.000		-		0.000	0.000	17.722	-
Government Engineering Support	WR	NSWC/PD : Philadelphia, PA	79.292	0.000		0.000		0.000		-		0.000	0.000	79.292	-
Government Engineering Support	Various	Government Activities : Various	57.637	0.000		0.000		0.000		-		0.000	0.000	57.637	-
Contractor Engineering Support	C/CPAF	Alion/CSC : Arlington, VA	49.802	0.000		0.000		0.000		-		0.000	0.000	49.802	-
Contractor Engineering Support	C/CPAF	Various : Various	28.087	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC/CD : Bethesda, MD	19.253	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Government Engineering Support	WR	PEO IWS : Various	9.391	0.000		0.000		0.000		-		0.000	0.000	9.391	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603581N / Littoral Combat Ship				Project (Number/Name) 3096 / Littoral Combat Ship					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	WR	General Dynamics Bath Iron Works : Bath, ME	0.933	0.000		0.000		0.000		-		0.000	0.000	0.933	-
Condition Based Maintenance	WR	NSWC/PHD : Port Hueneme, CA	5.180	0.000		0.000		0.000		-		0.000	0.000	5.180	-
Government Engineering Support	WR	NSWC/PHD : Port Hueneme, CA	3.650	0.000		0.000		0.000		-		0.000	0.000	3.650	-
Frigate Government Engineering Support	WR	NSWC/CD : Carderock, MD	1.179	0.000		0.000		0.000		-		0.000	0.000	1.179	-
Frigate Government Engineering Support	WR	NSWC/PD : Philadelphia, PA	0.468	0.000		0.000		0.000		-		0.000	0.000	0.468	-
Frigate Contractor Engineering Support	C/CPAF	Alion : Arlington, VA	0.973	0.000		0.000		0.000		-		0.000	0.000	0.973	-
Frigate Contractor Engineering Support	C/CPAF	Booz Allen Hamilton : McLean, VA	0.345	0.000		0.000		0.000		-		0.000	0.000	0.345	-
L&S Government Engineering Support	WR	NSWC/DD : Dahlgren, VA	5.830	14.309	Oct 2021	18.159	Oct 2022	7.281	Oct 2023	-		7.281	Continuing	Continuing	Continuing
L&S Government Engineering Support	WR	NSWC/CR : Crane, IN	0.451	1.250	Oct 2021	1.947	Oct 2022	0.823	Oct 2023	-		0.823	Continuing	Continuing	Continuing
L&S Government Engineering Support	WR	NSWC/PD : Philadelphia, PA	0.259	0.750	Oct 2021	8.436	Oct 2022	3.566	Oct 2023	-		3.566	Continuing	Continuing	Continuing
L&S Government Engineering Support	WR	Government Activities : Various	0.936	3.821	Oct 2021	8.300	Oct 2022	3.508	Oct 2023	-		3.508	Continuing	Continuing	Continuing
L&S Government Engineering Support	WR	NSWC/PHD : Port Hueneme, CA	0.000	4.363	Oct 2021	12.551	Oct 2022	4.910	Oct 2023	-		4.910	0.000	21.824	-
L&S Government Engineering Support	WR	NSWC/CD : Carderock, MD	0.260	0.268	Oct 2021	0.041	Oct 2022	0.017	Oct 2023	-		0.017	0.000	0.586	-
Subtotal			422.084	24.761		49.434		20.105		-		20.105	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603581N / Littoral Combat Ship				Project (Number/Name) 3096 / Littoral Combat Ship					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	C/CPAF	Alion/CSC : Arlington, VA	31.844	0.000		0.000		0.000		-		0.000	0.000	31.844	-
Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E)	WR	NSWC/PHD : Port Hueneme, CA	58.417	0.000		0.000		0.000		-		0.000	0.000	58.417	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC/PD : Philadelphia, PA	67.169	0.000		0.000		0.000		-		0.000	0.000	67.169	-
Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E)	WR	NSWC/PC : Panama City, FL	16.473	0.000		0.000		0.000		-		0.000	0.000	16.473	-
Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E)	WR	COMOPTEVFOR : Norfolk, VA	15.650	0.000		0.000		0.000		-		0.000	0.000	15.650	-
Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E)	WR	NSWC/COR : Corona, CA	19.140	0.000		0.000		0.000		-		0.000	0.000	19.140	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	Government Activities : Various	72.219	0.000		0.000		0.000		-		0.000	0.000	72.219	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	C/CPAF	LM/GD/Austal : Various	81.580	0.000		0.000		0.000		-		0.000	0.000	81.580	-
Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E)	WR	PEO C4I : Charleston, SC	11.562	0.000		0.000		0.000		-		0.000	0.000	11.562	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	PEO IWS : Various	22.544	0.000		0.000		0.000		-		0.000	0.000	22.544	-
Prior Year Live Fire Test & Evaluation Not Funded FYDP (PYLFT&E)	WR	NAVAIR : Patuxent River, MD	4.487	0.000		0.000		0.000		-		0.000	0.000	4.487	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603581N / <i>Littoral Combat Ship</i>						Project (Number/Name) 3096 / <i>Littoral Combat Ship</i>			

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Live Fire Test & Evaluation Not Funded FYDP (PYLFT&E)	WR	NAWC/WD : Pt. Mugu, CA	3.468	0.000		0.000		0.000		-		0.000	0.000	3.468	-
Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E)	WR	NSWC/CD : Bethesda, MD	24.784	0.000		0.000		0.000		-		0.000	0.000	24.784	-
Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E)	C/BA	National Science Foundation : Arlington, VA	2.671	0.000		0.000		0.000		-		0.000	0.000	2.671	-
Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E)	C/BA	NAVFAC Atlantic : Virginia Beach, VA	0.759	0.000		0.000		0.000		-		0.000	0.000	0.759	-
Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E)	C/BA	Naval Research Laboratory : Washington, DC	1.099	0.000		0.000		0.000		-		0.000	0.000	1.099	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC/DD : Dahlgren, VA	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			433.866	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
L&S Program Management Support	WR	Various : Various	2.068	2.109	Nov 2021	3.745	Oct 2022	1.583	Oct 2023	-		1.583	Continuing	Continuing	Continuing
Program Management Support- SEAPORT	C/CPAF	Alion/CSC : Arlington, VA	20.593	0.000		0.000		0.000		-		0.000	0.000	20.593	-
Program Management Support	Various	Various : Various	12.212	0.000		0.000		0.000		-		0.000	0.000	12.212	-
Subtotal			34.873	2.109		3.745		1.583		-		1.583	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023			
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603581N / Littoral Combat Ship					Project (Number/Name) 3096 / Littoral Combat Ship				
	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals	1,383.541	74.882		74.966		31.688		-		31.688	Continuing	Continuing	N/A	

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy										Date: March 2023			
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603581N / Littoral Combat Ship					Project (Number/Name) 3096 / Littoral Combat Ship			
Proj 3096	FY 2022				FY 2023				FY 2024				
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	
DT MCM													
L&S IPR 1													
MCM TECHEVAL													
L&S IPR 2													
L&S IPR 3													
L&S PHASE 1 INTEGRATION AND VALIDATION													
L&S Phase 2 Studies													
L&S Combat System Test Period													
2024DON - 0603581N - 3096													

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603581N / Littoral Combat Ship	Project (Number/Name) 3096 / Littoral Combat Ship	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3096				
L&S IPR 1: LCS Lethality & Survivability In Progress Review	4	2022	4	2022
L&S IPR 2: LCS Lethality & Survivability In Progress Review	2	2022	2	2022
L&S IPR 3: LCS Lethality & Survivability In Progress Review	4	2022	4	2022
L&S PHASE 1 INTEGRATION AND VALIDATION: Both Variants	2	2023	4	2023
L&S Phase 2 Studies: LCS Lethality & Survivability Combat System Integration Studies for Phase 2 - Both Variants	1	2023	3	2023
L&S Combat System Test Period: LCS Lethality & Survivability Combat System Test Period	1	2024	4	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603581N / <i>Littoral Combat Ship</i>				Project (Number/Name) 4506 / <i>LCS Training</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
4506: <i>LCS Training</i>	62.893	5.372	1.398	0.927	-	0.927	0.942	0.927	0.908	0.926	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 374												

A. Mission Description and Budget Item Justification

As a minimally-manned ship, the LCS uses a Train-to-Qualify (T2Q)/Train-to-Certify (T2C) training process in an off-ship/shore-based virtual ship trainer environment. These simulators and blended training solutions focus on tactical, equipment operations, and maintenance training. When completely developed and procured, the LCS shore-based training capability will satisfy individual, team, unit, and force training, with an objective of meeting Capability Development Document (CDD) T2Q/T2C Key Performance Parameter (KPP) requirements.

Funding will develop upgrades of the Surface Training Advanced Virtual Environment (STAVE) courseware and associated simulators to achieve the training objectives. Additionally, after fielding more of the systems and courseware, out-year funding will be utilized to upgrade training to maintain conformity with LCS configurations and approved operational technical manuals and procedures, as well as test and evaluate training devices to verify compliance with requirements.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: LCS Total System Training Architecture	5.372	1.398	0.927	0.000	0.927
Articles:	-	-	-	-	-
FY 2023 Plans:					
FY23 RDTE funding supports government labor and contract oversight for delivery of multiple LCS Scenario Development Stations (SDS) to LTF Mayport, LTF San Diego and Surface Warfare Schools Command located in Newport, RL. The SDS provides the ability to generate new tactical scenarios and update existing scenarios for use by the LCS Integrated Tactical Trainers and Bridge Part Task Trainers. Currently the operational trainers must be used to develop and validate scenarios which prevents use of the trainer by Ship crews. Without the SDS, the crew certification training at both LTFs will be impacted due to limited training resources. In addition to the SDS procurement, FY23 RDTE funding also supports government labor and oversight of the new Engineering Plant Technician course for the Freedom Variant LCS. The new course is being developed under Surface Training Advanced Virtual Environment (STAVE)-LCS and utilizes virtual immersive training to meet train to qualify (T2Q) and train to certify (T2C) requirements for this Engineering watchstation.					
FY 2024 Base Plans:					
FY24 RDTE funding supports government labor and contract oversight for delivery of multiple LCS Scenario Development Stations (SDS) to LTF Mayport, LTF San Diego and Surface Warfare Schools Command located in Newport, RL. The SDS provides the ability to generate new tactical scenarios and update existing scenarios					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy								Date: March 2023				
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603581N / Littoral Combat Ship			Project (Number/Name) 4506 / LCS Training					
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
for use by the LCS Integrated Tactical Trainers and Bridge Part Task Trainers. Currently the operational trainers must be used to develop and validate scenarios which prevents use of the trainer by Ship crews. Without the SDS, the crew certification training at both LTFs will be impacted due to limited training resources. SDS delivery should be completed in Q2 of FY24. In addition to the SDS procurement, FY24 RDTE funding also supports government labor and oversight of the new Engineering Plant Technician course for the Freedom Variant LCS. The new course is being developed under Surface Training Advanced Virtual Environment (STAVE)-LCS and utilizes virtual immersive training to meet train to qualify (T2Q) and train to certify (T2C) requirements for this Engineering watchstation. The course is planned for Fleet delivery in FY25.												
FY 2024 OCO Plans: N/A												
FY 2023 to FY 2024 Increase/Decrease Statement: Budget request decreased by -.471 from FY23 to FY24. This small change brings the budget into a steady state baseline for the FYDP.												
Accomplishments/Planned Programs Subtotals								5.372	1.398	0.927	0.000	0.927
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
• OPN/5664: Surface Training Equipment	135.814	198.695	196.736	-	196.736	145.548	195.848	173.546	174.382	Continuing	Continuing	
Remarks LCS funding accounts for only a portion of the OPN 5664 line: FY22 \$ 14.890, FY23 \$46.984, FY24 \$19,214												
D. Acquisition Strategy Per the combined LCS Navy Training System Plan (NTSP), the LCS crew training concept will meet Train to Qualify (T2Q) and Train to Certify (T2C) requirements incrementally, with expected completion in FY25. In the interim, individual qualifications for LCS crew members will be accomplished through a combination of vendor training, existing Navy training, new LCS courses and trainers that are presently online, and Under Instruction (U/I) time aboard LCS ships, prior to reporting for duty. Shore-based training requirements cannot be fully met with the interim LCS training strategy. Full realization will be achieved with the completed standup of the San Diego and Mayport, LCS Training Facilities (LTF), which include the Integrated Tactical Trainers, Bridge, Readiness Control Officer (RCO), Combat Systems and Mission Package Training System (MPTS) part-task trainers, the Common Mission Package Trainer (CMPT), Mission Bay Trainer and Virtual Reality Labs to support the Train to Qualify operations and maintenance pipeline courses.												

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603581N / Littoral Combat Ship				Project (Number/Name) 4506 / LCS Training					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Deck/Mission Bay Courseware	C/FFP	Cubic : Orlando, FL	2.253	0.225	Nov 2021	0.000		0.000		-		0.000	0.000	2.478	-
Combat Systems Courseware	C/FFP	Cubic : Orlando, FL	28.551	0.000		0.000		0.000		-		0.000	7.800	36.351	-
Eng. Training Courseware	C/FFP	Cubic : Orlando, FL	1.092	0.920	Nov 2021	0.000		0.000		-		0.000	4.906	6.918	-
Training Development - Support	WR	NAWC/TSD : Orlando, FL	12.293	0.407	Jul 2022	1.298	Oct 2022	0.927	Nov 2023	-		0.927	Continuing	Continuing	Continuing
VTUAV/MH60	C/FFP	TBD : TBD	0.364	0.000		0.000		0.000		-		0.000	6.270	6.634	-
Mission Bay Trainer	C/CPAF	Cubic : Orlando, FL	1.523	0.000		0.000		0.000		-		0.000	0.000	1.523	-
ITT/BPTT SDS	WR	NAWC/TSD : Orlando, FL	0.000	3.820	Jul 2022	0.000		0.000		-		0.000	0.000	3.820	-
Subtotal			46.076	5.372		1.298		0.927		-		0.927	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Human Systems Integration	WR	NSWC, DD : Dahlgren Virginia	1.029	0.000	Nov 2021	0.100	Mar 2023	0.000		-		0.000	0.000	1.129	-
Information Assurance	WR	NSWC, DN : Dam Neck, VA	4.414	0.000		0.000		0.000		-		0.000	0.000	4.414	-
Training ISEA	WR	NSWC/PHD : Port Huenuma, CA	1.804	0.000	Nov 2021	0.000		0.000		-		0.000	0.000	1.804	-
Warfare Center SME/ NAVFAC	WR	VARIOUS : VARIOUS	2.955	0.000	Nov 2021	0.000		0.000		-		0.000	0.000	2.955	-
Subtotal			10.202	0.000		0.100		0.000		-		0.000	0.000	10.302	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Support	C/CPAF	Various : Various	6.615	0.000	Nov 2021	0.000		0.000		-		0.000	0.000	6.615	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603581N / Littoral Combat Ship				Project (Number/Name) 4506 / LCS Training					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			6.615	0.000		0.000		0.000		-		0.000	0.000	6.615	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			62.893	5.372		1.398		0.927		-		0.927	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4								R-1 Program Element (Number/Name) PE 0603581N / Littoral Combat Ship				Project (Number/Name) 4506 / LCS Training			

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 4506																												
Surface Training Advanced Virtual Environment (STAVE): DECK STAVE - Development																												
Surface Training Advanced Virtual Environment (STAVE): Engineering Training Courseware Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603581N / Littoral Combat Ship		Project (Number/Name) 4506 / LCS Training	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 4506				
Surface Training Advanced Virtual Environment (STAVE): DECK STAVE - Development	1	2022	2	2025
Surface Training Advanced Virtual Environment (STAVE): Engineering Training Courseware Development	1	2022	4	2026

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603582N / Combat System Integration							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	472.530	16.884	18.236	18.610	-	18.610	18.369	18.688	18.953	19.335	Continuing	Continuing
0164: Combat System Integration	472.530	16.884	18.236	18.610	-	18.610	18.369	18.688	18.953	19.335	Continuing	Continuing

A. Mission Description and Budget Item Justification

Chief of Naval Operations (CNO) created the Navy's Strike Force Interoperability (SFI) program in 1998 in response to critical shortfalls in the introduction of integrated and interoperable System of Systems (SoS) to deploying Strike Forces. Interoperability concerns still exist today as new systems are introduced to the Fleet, interoperating with older systems, and the complexity of the SoS integration has continued to increase. These programs mitigate SoS integration and interoperability issues by identifying critical shortfalls before the systems are released to the Fleet. Warfighters depend on these programs on a daily basis to remove or reduce the interoperability risk associated with the systems they are tasked to operate. Commander, Naval Sea Systems Command (COMNAVSEA) acts as management lead for Joint System Command (SYSCOM) system certification policy and guidance and certifies platforms for interoperability within the platform and throughout the enterprise, in accordance with Commander, US Fleet Forces Command/Commander, Pacific Fleet COMUSFLTFORCOM/COMPACFLT) Ins. 4720.3C dated 18 SEP 2017 (C5ISR Modernization Policy). COMUSFLTFORCOM/COMPACFLT INST. 4720.3C also requires that COMNAVSEA act as administrative agent for Naval Information Forces (NAVIFOR) Command and Control, Communications, Computers, Combat Systems, Intelligence, Surveillance and Reconnaissance Modernization Process (C5IMP), and execution agent for Navy Command and Control, Communications, Computers, Combat Systems, Intelligence, and Surveillance and Reconnaissance Modernization Council (NCMC). This program conducts Interoperability Assessments that are required to certify Aircraft Carriers, Amphibious Assault Ships, and Surface Combatants in accordance with the Naval Warfare System Certification Policy (NWSCP) NAVSEAINST 9410.2A, NAVAIR 5230.20, AND SPAWAR 5234.1). The SFI program ensures overall Strike Force Interoperability is characterized and assessed. COMNAVSEA is assigned central United States Navy (USN) responsibility for interoperability, directing the development of policy and architecture for Strike Force Warfare Systems engineering and implementation of common warfare systems engineering processes.

There are three priorities within the Strike Force Interoperability Program:

- (1) Support Fleet "as-is" state which includes Navigation System Certification (NAVCERT), Strike Group Interoperability (SGI) Capabilities & Limitations (CAPS&LIMS), and Interoperability Tactical Information Coordinator Technical Aids (TIC TECHAIDS). These functions provide the critical review, assessment and documentation to properly inform the warfighter of the status of the interoperability for the systems they operate.
- (2) Support Ship's system modernization (non-HME) including warfighting capability & other C5I upgrades including C5IMP Baseline Management. These functions ensure the warfighter is provided integrated and interoperable fielded systems to fulfill mission success.
- (3) Support Ship Warfare System Certification & Force Level Assessments. This includes Warfare Systems Certification, Interoperability Certification, Force Level Interoperability Analysis, & Assessments, Cybersecurity Assessments and recommendations for improvements to the program offices for implementation at the systems'

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 0603582N / <i>Combat System Integration</i>
<p>level. This critical function provides the confidence to the warfighter they are getting the best possible systems and that through the certification process the systems have been properly tested and assessed to ensure the best possible interoperability.</p> <p>Project 0164 Combat System Integration: This project consists of four key Pillars executed within the Strike Force Interoperability (SFI) Program:</p> <p>(1) Command & Control, Communications, Computer, Combat Systems, Intelligence, Surveillance and Reconnaissance (C5ISR) Modernization Process (C5IMP). The C5IMP validates the introduction of new systems and upgrades to existing systems into the fleet and ensures systems' maturity prior to shipboard installation thereby reducing risk and enhancing readiness and effectiveness of deploying ships and strike groups.</p> <p>(2) Warfare Systems Certification (WSCERT), which is essential to validating the maturity and operational performance of warfare systems prior to Fleet delivery and deployment.</p> <p>(3) The integrated Navigation System Certification (NAVCERT) program certifies the shipboard integrated navigation suite for safe navigation using the Electronic Charting and Display Information System Navy (ECDIS-N) as the primary plot. To support Strike Force Interoperability and ship's mission requirements, it ensures that the installed integration navigation suite provides accurate and timely navigation information (position, velocity, speed, heading, roll, and pitch) to all navigation data consumers (Warfare/Weapons Systems, Control Systems, and precision approach and landing systems). This ensure the safe maneuver of naval forces to execute missions throughout the full spectrum of conflict.</p> <p>(4) Interoperability Certification and Assessment (IOP C&A) is the critical independent assessment of strike group warfare systems operational performance. Interoperability assessment examines force level engagement threads, aircraft control, air battle management, and operational displays to ensure the warfighter is being provided the most interoperable systems available. Assessments of deploying ships in strike force configurations are accomplished through the use of the Navy's Distributed Integration and Interoperability Assessment Capability (DIIAC) which supports the Deputy Assistant Secretary of the Navy (DASN) "shift to the left" policy by providing early interoperability testing in the acquisition lifecycle. It is a Commander, U.S. Fleet Forces Command (CFFC) and Commander U.S. Pacific Fleet (COMPACFLT) requirement that all strike forces undergo interoperability assessment testing in the DIIAC prior to deployment. The support for DASN and requirements of the combatant commander cannot be accomplished without the full funding of these programs. Interoperability characterization results are used to develop fleet tactical tools (Capabilities & Limitations (C&L) documentation and Tactical Information Coordinator Technical Aids (TIC TECHAIDS)) on which the warfighters rely daily, that ensure that systems' operators understand the interoperability capabilities and limitations of their combat systems, as well as all units within the networked architecture, and have the watch station tools necessary for the execution of their tactical responsibilities. These are Fleet desired and NAVSEA required programs that must be fully funded to ensure the warfighter awareness of Strike Force Interoperability.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0603582N / Combat System Integration			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	17.322	18.236	18.589	-	18.589
Current President's Budget	16.884	18.236	18.610	-	18.610
Total Adjustments	-0.438	0.000	0.021	-	0.021
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.438	0.000			
• Program Adjustments	0.000	0.000	-0.162	-	-0.162
• Rate/Misc Adjustments	0.000	0.000	0.183	-	0.183

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603582N / <i>Combat System Integration</i>				Project (Number/Name) 0164 / <i>Combat System Integration</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0164: <i>Combat System Integration</i>	472.530	16.884	18.236	18.610	-	18.610	18.369	18.688	18.953	19.335	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 0164: Combat System Integration:

This project consists of four key Pillars executed within the Strike Force Interoperability (SFI) Program:

- (1) Command & Control, Communications, Computer, Combat Systems, Intelligence, Surveillance and Reconnaissance (C5ISR) Modernization Process (C5IMP). The C5IMP validates the introduction of new systems into the fleet and ensures systems' maturity prior to shipboard installation thereby reducing risk and enhancing readiness and effectiveness of deploying ships and strike groups.
- (2) Warfare Systems Certification (WSCERT), which is essential to validating the maturity and operational performance of warfare systems prior to Fleet delivery and deployment.
- (3) The integrated Navigation System Certification (NAVCERT) program certifies the shipboard integrated navigation suite for safe navigation using the Electronic Charting and Display Information System Navy (ECDIS-N) as the primary plot. To support Strike Force Interoperability and ship's mission requirements, it ensures that the installed integration navigation suite provides accurate and timely navigation information (position, velocity, speed, heading, roll, and pitch) to all navigation data consumers. This supports the following mission critical functions: pre-launch aircraft alignment, safe aircraft precision approach and landing operations, and accurate warfare/weapon systems targeting.
- (4) Interoperability Certification and Assessment (IOP C&A), the independent assessment of strike group warfare systems operational performance. Interoperability assessment examines force level engagement threads, aircraft control, air battle management, and operational displays. Assessments of deploying ships in strike force configurations are accomplished through the use of the Navy's Distributed Integration and Interoperability Assessment Capability (DIIAC) which supports the Deputy Assistant Secretary of the Navy (DASN) "shift to the left" policy by providing early interoperability testing in the acquisition lifecycle. It is a Commander, U.S. Fleet Forces Command (CFFC) and Commander U.S. Pacific Fleet (COMPACFLT) requirement that all strike forces undergo interoperability assessment testing in the DIIAC prior to deployment. Interoperability certification results are used to develop fleet tactical tools (Capabilities & Limitations (C&L) documentation and Tactical Information Coordinator Technical Aids (TIC TECHAIDS)), that ensure that systems' operators understand the interoperability capabilities and limitations of their combat systems and have the watch station tools necessary for the execution of their tactical responsibilities.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Navigation System Certification (NAVCERT)	1.245	1.395	1.385	0.000	1.385

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603582N / Combat System Integration		Project (Number/Name) 0164 / Combat System Integration	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Articles: Description: Modern warfare systems installed in US Navy ships require accurate position and time to achieve required effects. At the strike force level, accurate position and time are required to enable interoperability of warfighting systems of systems. The Integrated Navigation Suite Certification (NAVCERT) pillar of SFI certifies the accuracy of ship's position information, and verifies that it is properly distributed to sensors and weapons systems installed in US Navy ships. Certification is required at five-year intervals, following Chief of Naval Operations Availabilities greater than six months, in support of Precision Approach and Landing System (PALS) certification, or when configuration changes have been made to the ships integrated navigation suite. Certification testing verifies the accuracy of sensors that determine heading, velocity, attitude, and position; and validates receipt of navigation data by all- consuming systems including Integrated Warfare (or Mission) Systems, Aircraft Inertial Alignment System, and Control Systems. The scope of the certification includes all inertial navigation system equipment as well as the Electronic Chart Display and Information System - Navy (ECDIS- N). Forecasting out year NAVCERT requirements is based on the projection of expiring certifications, scheduled maintenance availabilities, and modernization of installed integrated navigation systems. Wherever possible, the program leverages integrated navigation suite modernization efforts to reduce overall program costs. FY 2023 Plans: Conduct 30 scheduled NAVCERTS on USN Surface Ships. Continue to minimize costs by leveraging test results from conjunctive alterations to navigation systems during modernization periods, wherever possible. FY 2024 Base Plans: Conduct 25 scheduled NAVCERTS on USN Surface Ships. Continue to minimize costs by leveraging test results from conjunctive alterations to navigation systems during modernization periods, wherever possible. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Funding decrease from FY23 1.395 to FY24 1.385 due to fewer planned NAVCERTS in FY24.	-	-	-	-	-
Title: Command , Control, Communications, Computers, Combat Systems, Intelligence, Surveillance and Reconnaissance (C5ISR) Modernization Process (C5IMP) Articles:	2.036 -	2.296 -	2.360 -	0.000 -	2.360 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603582N / <i>Combat System Integration</i>	Project (Number/Name) 0164 / <i>Combat System Integration</i>	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Description: Achieving and maintaining Strike Force Interoperability requires disciplined engineering, system integration, and configuration management at both the platform (ship or shore station) and strike force level (Carrier Strike Group/ Amphibious Readiness Group). The Command, Control, Communications, Computers, Combat Systems, Intelligence, Surveillance, Reconnaissance (C5ISR) Modernization Program (C5IMP) pillar of SFI ensures deploying strike force ships receive modernized and interoperable warfighting capabilities in order to meet theater operational requirements. This project funds engineering assessments of proposed C5I capability improvements to determine maturity for installation as well as technical and schedule risk associated with proposed hardware and software changes. This project directly supports requirements of the Fleet C5I Modernization Policy (per COMUSFLTFORCOM/COMPACFLT Inst. 4720.3) which assigns responsibilities to NAVSEA 05H to assess operational risks associated with C5ISR modernization in both afloat and ashore units in support of the Optimized Fleet Response Plan (OFRP). The deliverables of this project are created by determining the maturity, through engineering analysis, of the critical linchpins needed to achieve interoperability for each proposed C5IMP capability improvement item to be installed in a ship's baseline, developing installation recommendations of C5I system upgrades for the Fleet Commanders, and researching and analyzing installation or operating problems. This includes a review of Warfare System Ship Change Documents (SCDs). Failure to achieve required maturity for one system that is part of an interoperable warfare system package can prevent this system from being installed, thus breaking the capability planned for the entire original warfare package, which will impact Strike Group warfighting capabilities. There is close coordination with the FLTCDRs and TYCOMs as well as other members of the C5IMP community to address, coordinate, and resolve C5IMP modernization issues thereby reducing risk and enhancing readiness and effectiveness of deploying ships and strike groups. Focus is on key milestones such as Baseline Locking Events (BLEs) and Planned Not Authorized (PNA) reviews, and SG/ARG Analysis Reports which are Fleet required events. The BLEs, PNA Reviews, and SG/ARG Analysis Reports are the primary work products in the C5IMP process. Additionally, due to emerging warfighting requirements and the development of required hardware and software changes between CNO Availability periods, an electronic change control board has been developed (BFI-CCB) to facilitate the request, review and approval of proposed Baseline changes.</p> <p>Forecasting C5ISR requirements and schedules is based on the projection of ships' operating/maintenance schedules at a particular point in time. Due to changing operational needs, these schedules frequently change causing availability extensions, deferrals, cancellations, or delays. The supporting C5IMP/C5ISR schedules must adjust accordingly, resulting in regular modifications to the numbers of events/requirements projected for C5IMP/C5ISR from period to period. C5ISR Configuration Control is maintained and updated continuously for every ship. Maintenance of the Afloat Master Planning System (AMPS) data for the approximately 235 active</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603582N / Combat System Integration		Project (Number/Name) 0164 / Combat System Integration		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Battle Force ships, along with establishing initial configurations for the New Construction ships entering the Fleet each year is essential and a major effort. This data is extracted and formatted to develop the BLE and PNA Review presentations which enable the Fleet commanders and TYCOMs to make informed modernization decisions. Additionally, numerous data calls are requested each month to answer configuration queries and perform studies utilizing AMPS data. CUSFFC/CPF Instruction 4720.3C designates NAVSEA 05H4 as the executing agent for the two NCMCs held each year. This requires C5IMP personnel to make all logistical and administrative arrangements for the 150+ attendees, collect and present all briefs, set up VTC and phone centers for remote attendees, and maintain all associated records for these councils. Fleet Commanders, TYCOMs, SYSCOMs and supporting personnel gather at NCMCs to discuss advance plans, coordinate near term modernization plans, coordinate shore and shipboard installations to ensure support prior to deployments, resolve schedule issues and establish priorities. Action items are recorded and tracked by NAVSEA, and major issues are reported to a joint FFC/CPF flag/SES panel.</p> <p>FY 2023 Plans:</p> <p>(1) Facilitate reviews, assessments, and execution of C5ISR installations during 75 CNO Availabilities.</p> <p>(2) Review approximately 850 warfare system Ship Change Documents. Assess impact to Interoperability. Create and maintain database entries for approximately 1,400 new software and hardware upgrades to be entered and tracked in the Afloat Master Planning System (AMPS), the fleets authoritative database for C5I modernization.</p> <p>(3) Support two (2) NCMCs</p> <p>(4) Support twelve (12) Monthly Baseline Locking Events where 64 Ships' Baselines will be reviewed and locked by the respective Fleet Commander representatives and twelve (12) monthly PNA Review Meetings where the PNA status of 57 ships will be reviewed.</p> <p>(5) Evaluate, comment on, and process approximately 2500 proposed Baseline changes via the Electronic Change Control Board process (BFI-CCB). These changes will include requests for addition of new hardware and software to ships, deletion from planned installations and TCD Waiver requests.</p> <p>(6) Establish initial warfare system baselines for 7 new construction ships.</p> <p>FY 2024 Base Plans:</p> <p>(1) Facilitate reviews, assessments, and execution of C5ISR installations during 75 CNO Availabilities.</p> <p>(2) Review approximately 850 warfare system Ship Change Documents. Assess impact to Interoperability. Create and maintain database entries for approximately 1,400 new software and hardware upgrades to be entered and tracked in the Afloat Master Planning System (AMPS), the fleets authoritative database for C5I modernization.</p>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603582N / <i>Combat System Integration</i>	Project (Number/Name) 0164 / <i>Combat System Integration</i>			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
(3) Support two (2) NCMCs (4) Support twelve (12) Monthly Baseline Locking Events where 64 Ships' Baselines will be reviewed and locked by the respective Fleet Commander representatives and twelve (12) monthly PNA Review Meetings where the PNA status of 57 ships will be reviewed. (5) Evaluate, comment on, and process approximately 2500 proposed Baseline changes via the Electronic Change Control Board process (BFI-CCB). These changes will include requests for addition of new hardware and software to ships, deletion from planned installations and TCD Waiver requests. (6) Establish initial warfare system baselines for 7 new construction ships. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Funding increase from FY23 2.296 to FY24 2.360 to sustain requirements and inflation.						
Title: Interoperability Certification and Assessment <div>Articles:</div> <div>Description: This warfare critical project funds interoperability assessments via the Distributed Integration & Interoperability Assessment Capability (DIIAC), the technical assessment of interoperable systems to meet mission requirements, the updating of Strike Group Capabilities and Limitations (C&L) and the updating of the Tactical Information Coordinator Technical Aids (TIC TECHAIDs). The project ensures NAVSEA/PEOs are delivering mature and interoperable warfare systems at the platform and Strike Group levels to the warfighter, with NAVSEA providing Strike Force interoperability certification and assessments. This project focuses on force-level impact of new systems and platforms under development. Interoperability Assessments of deploying ships in Strike Force configurations are accomplished through the utilization of the Navy's DIIAC, located at multiple Navy land-based sites located across the country and connected via networking technology, and that provides operational configurations for all naval combat systems. It is a U.S. Fleet Forces Command requirement that all Strike Forces undergo Interoperability Assessment Testing in the DIIAC prior to deployment. The DIIAC provides the only opportunity for comprehensive interoperability testing of combat system and C5I configuration items prior to shipboard delivery for operational use in surface combatant platforms and Strike Groups. DIIAC, with its ability to test systems in a Strike Group environment, is funded to support the warfare system's acquisition community to test their developmental items for interoperability. However, in this instance, while funds are provided to test the item in a Strike Group environment, funds are not provided for subsequent data analysis and risk assessment, as this is the cognizant acquisition program's responsibility. When the acquisition development is complete and corrections are made, DIIAC will then fund for the full interoperability</div>		11.428 -	12.212 -	12.480 -	0.000 -	12.480 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603582N / <i>Combat System Integration</i>	Project (Number/Name) 0164 / <i>Combat System Integration</i>	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>characterization testing of the baseline to include the requisite warfare system interoperability analysis and risk assessments needed to support the Warfare Systems Certification Decision (WSCD).</p> <p>Note, this effort also supports and feeds into the development of Fleet Products Tactical Tools such as Capabilities & Limitations (C&L) and Tactical Information Coordinator Technical Aids (TIC TECHAIDS), which are relied on daily to ensure that operators/warfighters understand the interoperability capabilities and limitations of their combat and C5I systems. C&Ls are published for all Strike Groups, Independent Deployers, and (when funded) their Coalition and Joint partners. TIC TECHAIDS are delivered to deploying Carrier Strike Groups (CSG's), Amphibious Ready Group (ARG's) and Independent Deployers prior to workups and then a final copy is provided prior to deployment. C&L and TIC TECHAIDS are the final report-out to Fleet operators/warfighters of the acquisition community's efforts. They are used on a daily basis and relied upon in every operational theater, as well as in every Navy and Joint Schoolhouse. Note, the DIIAC infrastructure is available, but not funded to support the surface Navy's participation in the Joint Testing Environments as well as the Maritime Theater Missile Defense (MTMD) Coalition Forces interoperability testing.</p> <p>FY 2023 Plans:</p> <ol style="list-style-type: none"> Conduct six (6) one-week Interoperability Land-Based test events including the following: <ul style="list-style-type: none"> -Development interoperability test to support for ACS Capability Package (CP) 23-1; ACS Baseline 10; ACS 5.4.1; SSDS 12.14; SSDS 12.15; FFG 62; and DDG 1000 -Interoperability Characterization test for ACS Capability Package (CP) 23-1; ACS Baseline 10; ACS 5.4.1; SSDS 12.14 and SSDS 12.15 -Certification Interoperability Risk assessment Brief for CS Capability Package (CP) 23-1; ACS Baseline 10; ACS 5.4.1; SSDS 12.13.03; SSDS 12.14 and SSDS 12.15 Complete C&L and TIC TECHAIDS, normally a near constant yearly demand requirement, also address AEGIS Ashore. <p>This will result in updates to Interoperability C&L for:</p> <ul style="list-style-type: none"> -Twenty-seven (26) Deploying Strike Groups (from a database containing 232 U.S. Surface Ships) and the aircraft for -Nine (9) Naval fixed wing Air Squadrons (covering F/A-18s, F-35, EA-18Gs, E-2Cs, E-2Ds,) Twenty-nine (29) Rotary Aircraft Squadrons (covering MH-60Ss, MH-60Rs), and Fifteen (15) Patrol Aircraft Squadrons (covering P-3Cs and P-8As). - Produce Interoperability C&L platform files for around Ninety (90) Coalition and Twenty to Thirty (20-30) Joint platforms to support major Fleet Exercises. 						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603582N / <i>Combat System Integration</i>		Project (Number/Name) 0164 / <i>Combat System Integration</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>3. Provide annual deliveries of Initial/Draft/Final TIC TECHAIDS to:</p> <p>-Six (6) Carrier Strike Groups (CSG's) Forty-one (41) Ships</p> <p>-Four (4) Amphibious Ready Group's (ARG's) nine (9) Ships</p> <p>-Thirty-eight (38) BMD Ships</p> <p>-Fourteen (14) Forward Deployed Naval Force (FDFN) Ships</p> <p>-Fifty (50) Independent Deploying Ships (CVN, CG, DDG, LCC and LCS)</p> <p>-Aegis Ashore Site (Romania and Poland)</p> <p>-Four (4) Fleet Area Control and Surveillance Facilities (FACSFAC's)</p> <p>-Ten (10) Fleet Maritime Operations Centers (MOC's) sites.</p> <p>- Support five (6) Interoperability Land-Based test events</p> <p>-12 MK-VI Patrol Boats</p> <p>FY 2024 Base Plans:</p> <p>1. Conduct six (6) one-week Interoperability Land-Based test events including the following:</p> <p>-Development interoperability test to support for ACS Baseline 10; ACS 5.4.1; SSDS 12.14; SSDS 12.15; LCS Atalanta WS, DDG 1000 9.X, and FFG 62(FFG 62 is currently planned but not resourced to support).</p> <p>-Interoperability Characterization test for ACS Capability Package (CP) 24-1; ACS Baseline 10; ACS 5.4.1; SSDS 12.14; LCS Atalanta WS, DDG 1000 9.X, and FFG 62(FFG 62 is currently planned but not resourced to support).</p> <p>-Certification Interoperability Risk assessment Brief for ACS Baseline 10; ACS 5.4.1; LCS Atalanta WS, DDG 1000 9.X, and FFG 62 (FFG 62 is currently planned but not resourced to support).</p> <p>2. Complete C&L and TIC TECHAIDS, normally a near constant yearly demand requirement, also address AEGIS Ashore.</p> <p>This will result in updates to Interoperability C&L for:</p> <p>-Twenty Four (24) Deploying Strike Groups (from a database containing Two Hundred-Thirty-Five (235) U.S. Surface Ships) and the aircraft for</p> <p>-Nine (9) Naval fixed wing Air Squadrons (covering F/A-18s, F-35, EA-18Gs, E-2Cs, E-2Ds,) Twenty-nine (29) Rotary Aircraft Squadrons (covering MH-60Ss, MH-60Rs), and Fifteen (15) Patrol Aircraft Squadrons (covering P-3Cs and P-8As).</p> <p>- Produce Interoperability C&L platform files for around Ninety (90) Coalition and Twenty to Thirty (20-30) Joint platforms to support major Fleet Exercises.</p>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603582N / Combat System Integration		Project (Number/Name) 0164 / Combat System Integration		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
3. Provide annual deliveries of Initial/Draft/Final TIC TECHAIDS to: -Six (6) Carrier Strike Groups (CSG's) Forty-one (41) Ships -Five (5) Amphibious Ready Group's (ARG's) Ten (10) Ships -Fourty (40) BMD Ships -Fourteen (14) Forward Deployed Naval Force (FDNF) Ships -Fifty-three (53) Independent Deploying Ships (CVN, CG, DDG, LCC and LCS) -Aegis Ashore Site (Romania and Poland) -Four (4) Fleet Area Control and Surveillance Facilities (FACSFAC's) -Nine (9) Fleet Maritime Operations Centers (MOC's) sites. - Support Six(6) Interoperability Land-Based test events -Twelve (12) MK-VI Patrol Boats FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Increase from FY23 12.212 to FY24 12.480 to sustain current requirements and inflation. Growth does not include resources to test new platforms in Interoperability Land-Based test events (FFG 62).						
Title: Warfare Systems Certification		2.175	2.333	2.385	0.000	2.385
Articles:		-	-	-	-	-
Description: Strike Force Interoperability (SFI) begins with properly engineered warfare systems installed in US Navy Ships. The Warfare Systems Certification (WSCERT) pillar of SFI certifies that modernized warfare systems are ready for installation, properly installed, and meet warfighting mission area requirements, to include the systems' interoperability and functional integration within the Strike Force that enables successful mission accomplishment. It funds the collection and independent technical assessment of that interoperability and integration using empirically derived Objective Quality Evidence (OQE) that installed warfare systems meet required performance specifications. Using established evaluation criteria, the project assesses the maturity of proposed warfare system modernizations prior to installation and certifies readiness of modernized warfare systems for operational deployment in ships, either independently or as components of Carrier/Expeditionary Strike Groups. When evaluation criteria are not met, the program funds the development and approval of operational risk assessments. This includes conducting an analysis of all work-arounds documented in Tactics, Techniques, and Procedures (TTPs), Capabilities & Limitations (C&L), and Trouble Reports (TR) to ensure that aggregate deficiencies and work-arounds do not render the warfare system, to include the operator, ineffective. NAVSEA accomplishes these efforts through a sequential series of technical reviews that begin 18-36 months						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy							Date: March 2023				
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603582N / <i>Combat System Integration</i>			Project (Number/Name) 0164 / <i>Combat System Integration</i>				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)							FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
prior to a scheduled modernization of a ship's warfare system, which includes development of a Warfare System Certification Plans (WSCP), conduct of Warfare Systems Certification Readiness Reviews (WSCRR), conduct of Warfare Systems Installation Assessments (WSIA), and prior to deployment, conduct of a Warfare Systems Certification Decisions (WSCD).											
FY 2023 Plans: (1) Conduct Warfare Systems Certifications Events via analysis of seven (7) Technical Areas for Warfare System Installation Assessment technical areas and ten (10) Assessment Areas for Warfare System Certification Decision and associated critical technical issues for one hundred fourteen (114) ships, including efforts for approximately one hundred thirty (130) Warfare Systems Certification Events (WSIAs, and WSCDs) and development of twelve (12) WSCPs for applicable ship classes. (2) Continue to strive for WSCERT execution efficiencies through workforce streamlining initiatives, criteria management and consolidation of WSCERT events.											
FY 2024 Base Plans: (1) Conduct Warfare Systems Certifications Events via analysis of seven (7) Technical Areas for Warfare System Installation Assessment technical areas and ten (10) Assessment Areas for Warfare System Certification Decision and associated critical technical issues for one hundred fourteen (114) ships, including efforts for approximately one hundred thirty (130) Warfare Systems Certification Events (WSIAs, and WSCDs) and development of twelve (12) WSCPs for applicable ship classes. (2) Continue to strive for WSCERT execution efficiencies through workforce streamlining initiatives, criteria management and consolidation of WSCERT events.											
FY 2024 OCO Plans: N/A											
FY 2023 to FY 2024 Increase/Decrease Statement: Increase from FY23 2.333 to FY24 2.385 in order to sustain requirements and inflation.											
Accomplishments/Planned Programs Subtotals							16.884	18.236	18.610	0.000	18.610
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• OPN 2960: <i>ICSTF: Integrated Combat System Test Facility</i>	5.829	6.053	6.345	-	6.345	6.359	6.492	6.627	6.762	0.000	112.631

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023	
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603582N / <i>Combat System Integration</i>				Project (Number/Name) 0164 / <i>Combat System Integration</i>			
C. Other Program Funding Summary (\$ in Millions)											
	<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u> <u>Total Cost</u>
<u>Remarks</u>											
D. Acquisition Strategy RDTEN funding under this line supports independent certification of the integration of major capability upgrades acquired by Program Executive Offices (PEOs) into host Navy Platforms and Strike Forces. The RDTEN engineering and certification activities at field sites do not involve direct procurement of equipment or engineering services, and hence no acquisition strategy is required. The major capability upgrades evaluated under this program fall under their associated PEOs' acquisition strategies.											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603582N / <i>Combat System Integration</i>				Project (Number/Name) 0164 / <i>Combat System Integration</i>					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SF Requirements Engineering & Analysis	WR	NSWCs : DN/PHD/ Corona	5.157	0.000		0.000		0.000		-		0.000	0.000	5.157	-
SF Requirements Engineering & Analysis	WR	Non-NSWCs : Various	5.295	0.000		0.000		0.000		-		0.000	0.000	5.295	-
Platform/Strike Force Certification	WR	NSWCs : DD/ICSTD/ DN/Corona	39.732	0.000		0.000		0.000		-		0.000	0.000	39.732	-
Platform/Strike Force Certification	WR	Non-NSWCs : Various	27.843	0.000		0.000		0.000		-		0.000	0.000	27.843	-
Fleet Response Plan (FRP)	WR	NSWCs : DD/PHD/ DN	27.030	0.000		0.000		0.000		-		0.000	0.000	27.030	-
Fleet Response Plan (FRP)	WR	Non-NSWCs : Various	3.793	0.000		0.000		0.000		-		0.000	0.000	3.793	-
Combat Systems Cert ISO Platform Cert	WR	NSWCs : DN/DD/ PHD/Corona	24.640	0.000		0.000		0.000		-		0.000	0.000	24.640	-
Combat Systems Cert ISO Platform Cert	WR	Non-NSWCs : Various	1.853	0.000		0.000		0.000		-		0.000	0.000	1.853	-
C5IMP & Fleet Readiness	WR	NSWCs : PHD	21.532	2.372	Nov 2021	2.474	Nov 2022	2.524	Nov 2023	-		2.524	Continuing	Continuing	Continuing
C5IMP & Fleet Readiness	C/CPFF	Non-NSWCs : Various	1.135	0.295	Dec 2021	0.365	Dec 2022	0.385	Dec 2023	-		0.385	0.000	2.180	-
Warfare Systems Certification	WR	NSWCs : DD/Crane	19.325	0.200	Nov 2021	0.270	Nov 2022	0.300	Nov 2023	-		0.300	Continuing	Continuing	Continuing
Warfare Systems Certification	WR	Non-NSWCs : Various	3.500	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CNI/Design Agent	SS/CPAF	General Dynamics : Not Specified	47.926	0.000		0.000		0.000		-		0.000	0.000	47.926	-
CNI/Software Engineering	WR	NSWC : Dahlgren	8.383	0.000		0.000		0.000		-		0.000	0.000	8.383	-
CNI/Test and Evaluation	WR	CDSA : Not Specified	3.922	0.000		0.000		0.000		-		0.000	0.000	3.922	-
CNI/Systems Engineering	WR	NSWC : PHD	2.645	0.000		0.000		0.000		-		0.000	0.000	2.645	-
CNI/Miscellaneous	WR	Various : Not Specified	7.529	0.000		0.000		0.000		-		0.000	0.000	7.529	-
OA Automated Test and Retest	WR	NSWCs : Various	17.500	0.000		0.000		0.000		-		0.000	0.000	17.500	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603582N / <i>Combat System Integration</i>	Project (Number/Name) 0164 / <i>Combat System Integration</i>
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contract Engineering Support	C/CPFF	Gryphon Technology : VA	41.315	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Contract Program Management Support	C/CPFF	Delta Resources Inc. : VA	9.154	0.298	Feb 2022	0.365	Feb 2023	0.395	Feb 2024	-		0.395	0.000	10.212	-
Travel	Allot	NAVSEA HQ : Washington, DC	2.441	0.020	Jan 2022	0.024	Jan 2023	0.024	Feb 2024	-		0.024	0.000	2.509	-
Interoperability Fixes	WR	NSWCs : Various	1.500	0.000		0.000		0.000		-		0.000	0.000	1.500	-
TIC TECHAIDS	WR	CSC : VA	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Warfare Systems Cybersecurity	WR	NSWCs : PHD, Dahiren & Corna	5.408	0.000		0.000		0.000		-		0.000	0.000	5.408	-
Capabilities & Limitations	WR	NSWCs : PHD	19.633	3.092	Nov 2021	3.342	Nov 2022	3.397	Nov 2023	-		3.397	0.000	29.464	-
Cybersecurity IA	C/CPFF	CSC : VA	0.544	0.000		0.000		0.000		-		0.000	0.000	0.544	-
Contract Engineering Support	C/CPFF	Delta Resources Inc. : VA	8.233	3.615	Feb 2022	3.860	Feb 2023	3.940	Feb 2024	-		3.940	0.000	19.648	-
Subtotal			356.968	9.892		10.700		10.965		-		10.965	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NSWCs : DD/ICSTF	5.736	0.000		0.000		0.000		-		0.000	0.000	5.736	-
Developmental Test & Evaluation (DT&E)	WR	NSWCs : DD/ SPAWAR/San Diego	26.804	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NIWC : Charleston, SC	16.016	1.245	Nov 2021	1.396	Nov 2022	1.410	Nov 2023	-		1.410	0.000	20.067	-
Developmental Test & Evaluation (DT&E)	WR	NSWCs : DD/DN/ SPAWAR	29.395	1.885	Jan 2022	1.994	Jan 2023	2.025	Jan 2024	-		2.025	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NSWCs : Various	12.623	0.000		0.000		0.000		-		0.000	0.000	12.623	-
Developmental Test & Evaluation (DT&E)	WR	NSWCs : DD/DN/ Corona	15.196	2.390	Nov 2021	2.551	Nov 2022	2.590	Nov 2023	-		2.590	0.000	22.727	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity						R-1 Program Element (Number/Name)				Project (Number/Name)					
1319 / 4						PE 0603582N / Combat System Integration				0164 / Combat System Integration					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	C/CPFF	Non-NSWCS : CNA	7.268	1.472	Jan 2022	1.595	Jan 2023	1.620	Jan 2024	-		1.620	0.000	11.955	-
Developmental Test & Evaluation (DT&E)	C/CPFF	CSC : Washington, DC	1.256	0.000		0.000		0.000		-		0.000	0.000	1.256	-
Developmental Test & Evaluation (DT&E)	WR	NUWCs : Keyport	1.268	0.000		0.000		0.000		-		0.000	0.000	1.268	-
Subtotal			115.562	6.992		7.536		7.645		-		7.645	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			472.530	16.884		18.236		18.610		-		18.610	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy										Date: March 2023			
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603582N / <i>Combat System Integration</i>				Project (Number/Name) 0164 / <i>Combat System Integration</i>				
	FY 2022				FY 2023				FY 2024				
Combat System Integration	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
NAVCERT	NAVCERTs (22-1)	NAVCERTs (22-2)	NAVCERTs (22-3)	NAVCERTs (22-4)	NAVCERTs (23-1)	NAVCERTs (23-2)	NAVCERTs (23-3)	NAVCERTs (23-4)	NAVCERTs (24-1)	NAVCERTs (24-2)	NAVCERTs (24-3)	NAVCERTs (24-4)	
C5IMP													
	Monthly Baseline												
	NCMC-1				NCMC-2								
	SG/ARG Analysis Report												
	PNA Reviews (12/Year)												
	BFI-C CB Review												
	Monthly Baseline												
	NCMC-1				NCMC-2								
	SG/ARG Analysis Report												
	PNA Reviews (12/Year)												
	BFI-C CB Review												
Monthly Baseline													
NCMC-1				NCMC-2									
SG/ARG Analysis Report													
PNA Reviews (12/Year)													
BFI-C CB Review													
Interoperability Certification & Assessments	FY22 Event (21-1)	FY22 Event (21-2),(21-3)	FY22 Event (21-4)	FY22 Event (21-5),(21-6)	FY23 Event (22-1)	FY23 Event (22-2),(22-3)	FY23 Event (22-4)	FY23 Event (22-5),(22-6)	FY24 Event (23-1)	FY24 Event (23-2),(23-3)	FY24 Event (23-4)	FY24 Event (23-5),(23-6)	
Warfare Systems Certification	FY 22 WSC				FY 23 WSC				FY 24 WSC				

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603582N / <i>Combat System Integration</i>	Project (Number/Name) 0164 / <i>Combat System Integration</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
COMBAT SYSTEM INTEGRATION				
NAVCERT: FY22 Q1 NAVCERTs (1 CVN, 3 DDGs, 2 LHDs, 1 MCM)	1	2022	1	2022
NAVCERT: FY22 Q2 NAVCERTs (3 CGs, 1 CVN, 5 DDGs, 1 LHD, 1 LCC, 1 PC)	2	2022	2	2022
NAVCERT: FY22 Q3 NAVCERTs (1 CVN, 1 LHD, 1 LPD, 1 LSD, 2 PCs) PLANNED	3	2022	3	2022
NAVCERT: FY22 Q4 NAVCERT (4 DDGs, 1 LPD 3 LSDs) PLANNED	4	2022	4	2022
NAVCERT: FY23 Q1 NAVCERT (2 CVNs, 6 DDGs, 1 LCS, 2 LPDs, 3 LSDs, 1 PC) PLANNED	1	2023	1	2023
NAVCERT: FY23 Q2 NAVCERT (1 CG, 4 DDGs, 1 PC) PLANNED	2	2023	2	2023
NAVCERT: FY23 Q3 NAVCERT (2 CGs, 2 CVNs, 5 DDGs, 2 LCSs, 1 LHD, 1 LPD, 1 PC) PLANNED	3	2023	3	2023
NAVCERT: FY23 Q4 NAVCERT (1 CG, 1 CVN, 4 DDGs, 1 LHD) PLANNED	4	2023	4	2023
NAVCERT: FY24 Q1 NAVCERT (1 DDG, 2 LCSs, 1 LHD, 2 MCMs) PLANNED	1	2024	1	2024
NAVCERT: FY24 Q2 NAVCERT (1 CVN, 1 DDG, 2 LCSs, 1 LHA, 1 PC) PLANNED	2	2024	2	2024
NAVCERT: FY24 Q3 NAVCERT (1 DDG, 1 LCS) PLANNED	3	2024	3	2024
NAVCERT: FY24 Q4 NAVCERT(4 DDGs, 2 LCSs, 2 LHDs, 3 LPDs) PLANNED	4	2024	4	2024
C5IMP: FY22 C5IMP Monthly Baseline Lock (12/Year) (65 Ships)	1	2022	4	2022
C5IMP: FY22 NCMC - 1	2	2022	2	2022
C5IMP: FY22 NCMC - 2	4	2022	4	2022
C5IMP: FY22 SG/ARG Analysis Report (2/Year - Presented at NCMC)	2	2022	4	2022
C5IMP: FY22 PNA Reviews (12/Year) (58 Ships)	1	2022	4	2022
C5IMP: FY22 BFI-CCB Review,comment on and process approximately 2800 proposed changes throughout the year.	1	2022	4	2022
C5IMP: FY23 C5IMP Monthly Baseline Lock (12/Year) (64 Ships)	1	2023	4	2023
C5IMP: FY23 NCMC - 1	2	2023	2	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603582N / Combat System Integration		Project (Number/Name) 0164 / Combat System Integration	
Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
C5IMP: FY23 NCMC - 2	4	2023	4	2023
C5IMP: FY23 SG/ARG Analysis Report (2/Year - Presented at NCMC)	2	2023	4	2023
C5IMP: FY23 PNA Reviews (12/Year) (57 Ships)	1	2023	4	2023
C5IMP: FY23 BFI-CCB Review,comment on and process approximately 2500 proposed changes throughout the year.	1	2023	4	2023
C5IMP: FY24 C5IMP Monthly Basline Lock (12/Year) (64 Ships)	1	2024	4	2024
C5IMP: FY24 NCMC -1	2	2024	2	2024
C5IMP: FY24 NCMC -2	4	2024	4	2024
C5IMP: FY24 SG/ARG Analysis Report (2/Year - Presented at NCMC)	2	2024	4	2024
C5IMP: FY24 PNA Reviews (12/Year 57 Ships)	1	2024	4	2024
C5IMP: FY24 BFI-CCB Review,comment on and process approximately 2500 proposed changes throughout the year.	1	2024	4	2024
Interoperability Certification & Assessments: FY22 Event (22-1)	1	2022	1	2022
Interoperability Certification & Assessments: FY22 Event (22-2),(22-3)	2	2022	2	2022
Interoperability Certification & Assessments: FY22 Event (22-4)	3	2022	3	2022
Interoperability Certification & Assessments: FY22 Event (22-5),(22-6)	4	2022	4	2022
Interoperability Certification & Assessments: FY23 Event (23-1)	1	2023	1	2023
Interoperability Certification & Assessments: FY23 Event (23-2),(23-3)	2	2023	2	2023
Interoperability Certification & Assessments: FY23 Event (23-4)	3	2023	3	2023
Interoperability Certification & Assessments: FY23 Event (23-5),(23-6)	4	2023	4	2023
Interoperability Certification & Assessments: FY24 Event (24-1)	1	2024	1	2024
Interoperability Certification & Assessments: FY24 Event (24-4)	3	2024	3	2024
Interoperability Certification & Assessments: FY24 Event (24-2)(24-3)	2	2024	2	2024
Interoperability Certification & Assessments: FY24 Event (24-5)(24-6)	4	2024	4	2024
Warfare Systems Certification: FY22 Warfare Systems Cert (131 Certification Events + 12 WSCPs)	1	2022	4	2022

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603582N / <i>Combat System Integration</i>	Project (Number/Name) 0164 / <i>Combat System Integration</i>		
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
Warfare Systems Certification: FY23 Warfare Systems Cert (140 Certification Events + 20 WSCPs)		1	2023	4	2023
Warfare Systems Certification: FY24 Warfare Systems Cert (132 Certification Events + 35 WSCPs)		1	2024	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	4,390.527	302.004	344.981	257.076	-	257.076	193.861	195.724	182.954	209.402	Continuing	Continuing
3220: COLUMBIA Class Submarine Development	4,390.527	287.533	268.996	185.739	-	185.739	121.400	121.994	107.882	134.707	Continuing	Continuing
3440: SBSD Obsolescence	0.000	0.000	20.261	21.655	-	21.655	21.964	22.365	22.751	22.639	Continuing	Continuing
3441: SBSD Technology Refresh	0.000	0.000	46.724	49.682	-	49.682	50.497	51.365	52.321	52.056	Continuing	Continuing
9999: Congressional Adds	0.000	14.471	9.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	23.471
Program MDAP/MAIS Code: Project MDAP/MAIS Code(s): 444												
A. Mission Description and Budget Item Justification This program element supports innovative research and development in submarine Hull, Mechanical and Electrical (HM&E) and combat systems technologies and the subsequent evaluation, demonstration, and validation for submarine platforms over the life cycle of the COLUMBIA Class. It will increase the submarine technology base and provide subsystem design options not currently feasible. The program element also supports programs transitioning from Science and Technology (S&T), Defense Advanced Research Projects Agency (DARPA), Independent Research and Development, and Small Business Innovation Research (SBIR) projects. The funding applies to the design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for Common Missile Compartment (CMC) design, whole ship design, and component technologies development for the next generation U.S. ballistic missile submarine (SSBN), the COLUMBIA Class. Project Unit 3220: The objective of the COLUMBIA Class Submarine Development is to design, prepare for, and support construction and delivery of the class that is the replacement of the OHIO Class SSBN. Project Unit 3440: This project provides the engineering development and program management required to outfit, upgrade, and support each ship of the COLUMBIA Class Submarine with a Non- Propulsion Electronics System (combat, sonar, etc.) that satisfies requirements to meet its sole mission of Strategic Deterrence over the class life cycle. Project Unit 3441: This project encompasses ship system development, coordination, and management efforts for the COLUMBIA Class Submarine Technology Insertion Program and Technology Refresh Program over the class life cycle. Project Unit 9999: This Congressional Add project funds efforts for the Advanced Materials Propeller Program, Materials for Submarine Propulsor Applications and Naval Propulsion Foundry Center Facility Power Upgrades.												

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0603595N / SSBN New Design			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	311.231	335.981	253.754	-	253.754
Current President's Budget	302.004	344.981	257.076	-	257.076
Total Adjustments	-9.227	9.000	3.322	-	3.322
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	9.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.212	0.000			
• SBIR/STTR Transfer	-9.015	0.000			
• Program Adjustments	0.000	0.000	-0.655	-	-0.655
• Rate/Misc Adjustments	0.000	0.000	3.977	-	3.977
Congressional Add Details (\$ in Millions, and Includes General Reductions)					
Project: 9999: Congressional Adds					
Congressional Add: <i>Rapid composites for wet submarine application</i>					
Congressional Add: <i>Columbia digital environment</i>					
Congressional Add Subtotals for Project: 9999					
Congressional Add Totals for all Projects					
Change Summary Explanation					
FY2023 increase from PB23 due to Congressional Add. FY2022 decrease from PB23 due to SBIR reduction and SSP cancelled accounts. FY24 - FY27 increases due to restoration of total force management and alignment with the NRE RDT&E Requirements from the 2021 05C Cost Checkpoint, including SSP DASO items.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design				Project (Number/Name) 3220 / COLUMBIA Class Submarine Development			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3220: COLUMBIA Class Submarine Development	4,390.527	287.533	268.996	185.739	-	185.739	121.400	121.994	107.882	134.707	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 444												
A. Mission Description and Budget Item Justification The COLUMBIA Submarine Class Program (previously the OHIO Replacement Class) is developing the next generation sea-based strategic deterrent. The funding applies to the design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for Common Missile Compartment (CMC) design, whole ship design, and component technologies development for the next generation U.S. ballistic missile submarine (SSBN). This RDT&E program supports cooperation with the United Kingdom (UK) to maintain strategic deterrence, based on a single effort to develop a CMC as agreed by the UK Secretary of State for Defense and the U.S. Secretary of Defense in 2009. At the COLUMBIA Program Semi-Annual Interim Progress Review (IPR) held on August 30, 2021, the USD(A&S) Milestone Decision Authority (MDA) directed COLUMBIA to be funded to the program baseline, including Integrated Enterprise Plan (IEP) funding as reflected in this budget submission. The total RDTE FY2023 increase of \$24.75M from FY2022 RDTE controls (+\$95.829M in the FYDP) is due to adjusting funding for the COLUMBIA Class Program to the baseline, and the start of funding in the 3440/3441 lines, which commence in FY23 per the program plan. The COLUMBIA program strategy is to leverage the re-use of existing Submarine system designs (as applicable), focus on lifecycle Total Ownership Cost (TOC) affordability, and meet the military requirements established for this SSBN to achieve mission success in a challenging environment. The requested funding levels provide for the Technology Development, Design, Engineering, and Integration efforts necessary to support the COLUMBIA Class SSBN lead ship construction along with continued development and design support for construction of the class. A Contract Modification for ongoing design/advance construction efforts was awarded on 22 Jun 2020, which also included the Build I Option for the First Two Ships. This was a Pre-Priced Option for the two ships, SSBN 826 and SSBN 827, and associated design/support efforts. This was a modification of the current IPPD contract (N00024-17-C-2117) and is in line with the program's approved Acquisition Strategy. The program requested authorization of SSBN 826 in FY21, funded with three years of incremental funding in FY21-23, and is requesting authorization of SSBN 827 in FY24, funded with two years of incremental funding in FY24-25. The RDT&E efforts support this plan. The following key activities support the COLUMBIA Class SSBN Program: 1. Design and development of a missile compartment, launch system, and Strategic Weapons Support Systems (SWSS) to meet U.S. strategic requirements while cooperating with the UK on modernizing its strategic deterrent in accordance with Presidential direction (December 2006). 2. Concept Definition, System Definition, and Detailed Design for remaining portions of the ship accomplished through a Design/Build/Sustain approach modeled after the approach used by the VIRGINIA Class program.												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023				
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design		Project (Number/Name) 3220 / COLUMBIA Class Submarine Development			
<p>3. Engineering and integration of existing technologies and development of new technologies required to provide the capabilities necessary to ensure platform operational effectiveness and minimize life cycle cost.</p> <p>4. Ongoing design support for construction of the submarine class.</p> <p>COLUMBIA Class SSBN concept study, system definition prototyping, and technology development efforts support design, systems engineering, component development and vendor qualification activities needed to develop the CMC design and the COLUMBIA whole ship design. The COLUMBIA design timelines are based on a design approach proven on the VIRGINIA Class Program, adjusted for the additional complexity of a missile compartment and Strategic Weapons Systems (SWS). Planned technical studies and prototyping are necessary to reduce risks associated with updating SSBN system designs for current technical standards and demonstrating design feasibility of developmental technology to meet the ship design and construction schedule.</p> <p>The Navy continues to invest in program funded affordability initiatives similar to those employed successfully for VIRGINIA Class, but tailored to the unique SSBN mission and operational tempo of COLUMBIA Class to drive down overall program costs. Efforts focus on reducing ship construction costs through implementing more effective design features and fabrication and assembly methods for a more affordable submarine. As part of this effort, alternative procurement and contracting strategies are also being utilized to include Multi-Program Material Procurement (MPMP) and Economic Order Quantity (EOQ).</p> <p>Activities were executed for the first article quad pack (FAQP) prototype of the CMC to support the UK DREADNOUGHT Program and COLUMBIA Program, and to continue validation of the Integrated Tube and Hull (ITH) build strategy. These activities included the continuation of the construction of the FAQP, which began August 2016, and completed in October 2019. This FAQP was determined to not be useable based on defective missile tubes and was cut apart to recover the missile tubes to use later in the program. The CMC program will mature required technologies and re-host the TRIDENT II D5 SWS (Launcher, Fire Control and Navigation) while ensuring no degradation to D5 security, safety, and performance. In addition, whole ship design efforts are focused on technologies requiring significant engineering, integration, and development time as well as those technologies that are required to support ship design and construction schedules such as the propulsor and maneuvering/ship control. These technologies are critical for stealth capability for a ship class that will be in service until the 2080s. Ship detailed design efforts include important activities such as finalizing ship arrangements, development of design disclosures to support build products, risk characterization, and mitigation, improvement and validation of performance prediction tools and improvement of design tools. Technology development addresses engineering and integration of existing technologies as well as maturation of developmental technologies.</p> <p>On 14 December 2016, the Secretary of the Navy announced the lead ship of the OHIO Replacement Program will be USS COLUMBIA (SSBN 826) which officially designates this program the COLUMBIA Class Submarine Program.</p>							
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Common Missile Compartment Design and Prototyping, and Whole Ship Design			153.040	158.930	97.839	0.000	97.839
Articles:			-	-	-	-	-
FY 2023 Plans:							

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023					
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design		Project (Number/Name) 3220 / COLUMBIA Class Submarine Development				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)				FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>CMC Design and Prototyping: This funding applies to the design, systems engineering, prototyping construction, and vendor qualification activities required to execute the schedule for Common Missile Compartment (CMC) construction schedule, design and component and/ technology development for the COLUMBIA submarine. Included in this effort is continued development of CMC design products and associated engineering/ management efforts.</p> <p>Specific planned construction efforts for FY 2023 include:</p> <ul style="list-style-type: none">- Continued fabrication of Missile Tubes and Strategic Weapons Support System (SWSS) kits.- Continued Lead Ship Construction, which includes manufacture of the Missile Tube Module (MTM) for lead ship, and integration and test of SWSS systems for the land based test facility. <p>Whole Ship Study and Design: This funding applies to the shipbuilder design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for whole ship design and component / technology development for the COLUMBIA submarine, and associated engineering/management efforts.</p> <p>Specific planned construction efforts for FY 2023 include:</p> <ul style="list-style-type: none">- Planned 99 percent of total Design Disclosures (approximately 4767 design disclosures including CMC design disclosures).- Planned completion is approximately 51 percent of Maintenance Integrated Logistics Products (1464 of 2870).- Planned completion is approximately 60 percent of Provisioning Integrated Logistics Products (2615 of 4371).- Planned completion of approximately 63 percent of Logistics Technical Data Products (474 of 752).- Planned construction effort in FY2023 includes construction execution on all Super Modules (1, 2, 3, 4, 5, and 6). <p>FY 2024 Base Plans:</p> <p>Specific planned construction efforts for FY 2024 include:</p> <ul style="list-style-type: none">- Continued fabrication of Missile Tubes and Strategic Weapons Support System (SWSS) kits.- Continued Lead Ship Construction, which includes manufacture of the MTM for lead ship, and integration and test of SWSS systems and Final Operating Capability (FOC) for the land based test facility. <p>Whole Ship Study and Design: This funding applies to the shipbuilder design, systems engineering, prototyping, and vendor qualification activities needed to execute the schedule for whole ship design and component / technology development for the COLUMBIA submarine, and associated engineering/management efforts.</p> <ul style="list-style-type: none">- Planned completion is approximately 57 percent of Maintenance Integrated Logistics Products (1226 of 2143).- Planned completion is approximately 79 percent of Provisioning Integrated Logistics Products (3465 of 4371).								

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design		Project (Number/Name) 3220 / COLUMBIA Class Submarine Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div>- Planned completion of approximately 81 percent of Logistics Technical Documentation products (635 of 787)</div> <div>- Specific planned construction efforts for FY 2024 including construction execution on all Super Modules (1, 2, 3, 4, 5, and 6).</div> <div>FY 2024 OCO Plans: N/A</div> <div>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to shipbuilder design performance, updates made in accordance with 2021 cost estimate and an overall shift to SCN.</div>						
<div>Title: NAVSEA R&D and Prototyping</div> <div>Articles:</div>		87.560	62.548	53.090	0.000	53.090
<div>FY 2023 Plans:</div> <div>This funding applies to the Government combat systems, component and technology development for the COLUMBIA submarine essential to achieving required survivability, combat and communications capabilities. Efforts planned in FY 2023 include: Combat systems</div> <div>- Continue to convert TI-24 Government Furnished Information changes into procurement ready documentation to support SSBN 827 Nuclear Propulsion Electronic System (NPES) shipset acquisition.</div> <div>- Continue AN/BST-1 and AN/BRR-6 reliability based engineering changes, qualification, and testing.</div> <div>- Continue environmental qualification testing of lead ship design Government Furnished Equipment.</div> <div>- Initiate COATS construction test facility Simulation/Stimulation equipment design and qualification testing</div> <div>- Continue to perform lab based cyber security testing of the lead ship NPES design</div> <div>- Complete final year of NPES laboratory-level software development and integration prior to construction delivery</div> <div>- Continue to perform incremental NPES sub-system integration testing with the Strategic Weapons Systems (SWS) using simulators and vendor site visits</div> <div>Component Development:</div> <div>- Continue Government support and oversight of development of the approximately 37 remaining of the initial 101 engineered components.</div> <div>- Support diesel generator integration testing at compatibility test facility.</div> <div>- Complete assembly of Thin Line Towed Array Handling System on lead ship.</div>		-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design		Project (Number/Name) 3220 / COLUMBIA Class Submarine Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div>- Continue qualification testing of the Advanced Carbon Dioxide Removal Unit (ACRU) based on incorporation of lessons learned from qualification testing.</div> <div>- Continue production of the ACRUs for Build I (826 and 827).</div> <div>- Continue reliability/operational testing of ACRU.</div> <div>- Continue at-sea operational assessment of ACRU on SSGN.</div> <div>Propulsor and Shafting:</div> <div>- Continue propulsor shock qualification analysis and design certification efforts.</div> <div>- Continue to update performance achievability assessments to reflect as-manufactured parts.</div> <div>Shock, Structures and Composites:</div> <div>- Continue test planning, test simulations and vehicle assessment for Large Vehicle Shock Testing.</div> <div>- Deliver the Out of Autoclave bow dome to Newport News Shipbuilding (NNS).</div> <div>- Complete fabrication of the first US shipset and the second and third UK shipset of the Navigation Sonar System Windows.</div> <div>Signatures:</div> <div>- Update whole-boat signature predictions using updated modeling and predictive tools.</div> <div>- Support GFE design efforts for a system and demonstration testing.</div> <div>- Support Physical Scale Model Testing and ICCP algorithms updates to account for as-built and damage scenarios.</div> <div>FY 2024 Base Plans:</div> <div>This funding applies to the Government combat systems, component and technology development for the COLUMBIA submarine essential to achieving required survivability, combat and communications capabilities.</div> <div>Efforts planned in FY 2024 include:</div> <div>Combat systems:</div> <div>- Conduct electronic and platform integration risk mitigation testing of the TI-24 NPES configuration across vendor and navy development sites.</div> <div>- Conduct TI-20 design review and factory acceptance testing for applicable SSBN 826 NPES shipset deliveries.</div> <div>Component Development:</div>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design		Project (Number/Name) 3220 / COLUMBIA Class Submarine Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div>- Continue Government support and oversight of development of approximately 7 remaining of the initial 101 engineered components.</div> <div>- Continue support of diesel generator integration testing at compatibility test facility.</div> <div>- Complete shock testing of diesel generator set.</div> <div>- Deliver Advanced Propulsor Bearing to Shipbuilder for first hull.</div> <div>- Delivery ACRU production unitsx for Build I (826 and 827).</div> <div>- Deliver Main Shaft Seal to Shipbuilder for first hull.</div> <div>- Deliver Main Shaft Brake Lock & Turning Gear to Shipbuilder for first hull.</div> <div>- Continue reliability/operational testing of ACRU.</div> <div>- Continue at-sea operational assessment of ACRU on SSGN.</div> <div>Propulsor and Shafting:</div> <div>- Continue propulsor shock qualification analysis and design certification efforts.</div> <div>- Continue to update performance achievability assessments to reflect as-manufactured parts.</div> <div>Shock and Structures:</div> <div>- Conduct Large Vehicle Shock Test at Aberdeen Proving Ground.</div> <div>- Start Preparations for initial deep dive testing.</div> <div>Signatures:</div> <div>- Update whole-boat signature predictions using updated modeling and predictive tools.</div> <div>- Support GFE design efforts for a system.</div> <div>- Support Physical Scale Model Testing and Iterative Closest Contour Point (ICCP) algorithms updates to account for as-built and damage scenarios.</div> <div>- Begin preparations for a VA full scale test to demonstrate new measurement and modeling approach for verifying full scale performance planned for CLB Class as a potential life cycle savings.</div> <div>FY 2024 OCO Plans:</div> <div>N/A</div> <div>FY 2023 to FY 2024 Increase/Decrease Statement:</div>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design		Project (Number/Name) 3220 / COLUMBIA Class Submarine Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Decrease represents the updated program cost estimate from 2021 capturing updates to government component and technology development efforts and an overall shift to SCN and commencement of follow ship R&D obsolescence and technology refresh starting in 2023.						
Title: Systems Engineering/Program Management		33.778	32.745	34.810	0.000	34.810
Articles:		-	-	-	-	-
FY 2023 Plans: - Execute Trident Training Facility (TTF) Kings Bay MILCON P676 on schedule to support Strategic System Programs (SSP) and NAVSEA ready for training dates. - Continue maturing Trident Refit Facility (TRF) Kings Bay P684. - Continue the advanced planning studies for NBK-Bangor and submit P817 for PRI#0 level of maturity. Test and Evaluation - Complete update and approval of the Test and Evaluation Master Plan (TEMP) and LFT&E Management Plan. - Update CLB Class Submarine Post-Delivery Testing Certifications Schedule Information. - Continue survivability modeling and simulation maturation. Updated CLB threat sonar models and simulated tactics using at-sea data. - Complete the third operator-in-the-loop hardware event, CLB-E3. CLB-E3 will assess CLB and threat submarines in a deep-water scenario. - Complete LFT&E shot line assessment and documentation in support of simulating underwater explosions at selected locations ("Shot Lines") outside CLB's hull and the propagation of energy through the decks and other structures to personnel and equipment to predict personal injuries and post event operational capability. - Report DT results to Deputy Director, Developmental Testing, Evaluations, and Assessments (D.D((DTE&A)) and DOT&E in accordance with the TEMP. - Complete Cybersecurity EDT 23 of CLB baseline Submarine Warfare Federated Tactical Systems (SWFTS), Common Submarine Radio Room (CSRR), and Consolidated Afloat Network Enterprise System (CANES)enclaves in summer 2023. This will be CLB's first cyber DT of the SWFTS variant installed on the first of class. - Continue planning Operational Test (OT-B2), an Operational Observation of DT (OODT), at Strategic Weapons System Ashore facility to assess the CLB TEMP Strike Critical Operational Issues (COIs). - Commence detailed planning for lead ship (SSBN 826) Acoustic trials, Electromagnetic Trials, Hydrodynamic Trials, and Conventional Weapon's Launcher Trials.						
FY 2024 Base Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design		Project (Number/Name) 3220 / COLUMBIA Class Submarine Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Test and Evaluation - Commence detailed planning for OT-B3, including verification and validation of Simulation II Digital Weapons Analysis Framework (SIMII/DWAF), the Ship Control Operational Trainer, and Control System Module Off-Hull Assembly and Test Site (COATS) for the survivability and strike COI assessment. - Continue survivability modeling and simulation maturation. Updated CLB threat sonar models and simulated tactics using at-sea data. - Report DT results to Deputy Director, Developmental Testing, Evaluations, and Assessments (D.D((DTE&A)) and DOT&E in accordance with the TEMP. - Complete Operational Test (OT-B2), an Operational Observation of DT (OODT), at Strategic Weapons System Ashore facility to assess the CLB TEMP Strike Critical Operational Issues (COIs). - Continue detailed planning for lead ship (SSBN 826) Acoustic trials, Electromagnetic Trials, Hydrodynamic Trials, and Conventional Weapon's Launcher Trials. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Increase for restoration of total force management and represents the updated program cost estimate from 2021 capturing updated program estimates.						
Title: Strategic Weapons System Integration Articles:		13.155 -	14.773 -	0.000 -	0.000 -	0.000 -
FY 2023 Plans: - Continue system engineering efforts required for the re-hosting and integration of the TRIDENT II (D5) SWS on the COLUMBIA submarine including review, modification, and update of SWS Coordination, Interface and Arrangement Drawings for SWS equipment within the CMC. - Complete SWS Fire Control Subsystem Trainer hardware and software design efforts. - Complete proofing of Shipyard Installation Test Program (SITP) Test Procedures and continue SWS Ashore (SWSA) integration and regression testing efforts at SWSA. FY 2024 Base Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design		Project (Number/Name) 3220 / COLUMBIA Class Submarine Development	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Continue system engineering efforts required for the re-hosting and integration of the TRIDENT II (D5) SWS on the COLUMBIA submarine including review, modification, and update of SWS Coordination, Interface and Arrangement Drawings for SWS equipment within the CMC. FY 2024 OCO Plans: Not applicable; R&D design efforts completed. R&D funding for first of class Test and Evaluation events required beginning in FY26. FY 2023 to FY 2024 Increase/Decrease Statement: R&D design efforts conclude in FY23.					
Accomplishments/Planned Programs Subtotals	287.533	268.996	185.739	0.000	185.739

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• RD TEN/0603570N/3219: SBSD Nuclear Technology Development	60.142	56.707	54.400	-	54.400	44.385	39.173	35.834	36.222	Continuing	Continuing
• RD TEN/0101221N/0951: Joint Warhead Fuze Sustainment Program	6.570	3.087	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	720.466
• OPN/5358: Strategic Missile Systems Equip	276.430	279.430	325.318	-	325.318	321.406	435.968	325.448	447.515	Continuing	Continuing
• WPN/1250: TRIDENT II Mods	1,120.241	1,125.164	1,284.705	-	1,284.705	1,705.878	2,468.925	2,897.274	3,186.112	4,352.768	30,073.252
• OMN/1D2D: Fleet Ballistic Missile	1,474.005	1,664.933	1,763.238	-	1,763.238	1,861.325	1,890.125	1,934.921	1,983.564	0.000	12,572.111
• SCN/1045: COLUMBIA Class Submarine	4,776.980	5,857.776	5,834.332	-	5,834.332	7,275.820	8,467.564	8,788.208	8,728.802	52,170.081	112,651.052
• MCN/64482044: MCON Design	512.729	520.442	502.827	-	502.827	214.687	168.206	144.893	155.359	0.000	2,219.143

Remarks

D. Acquisition Strategy

The Common Missile Compartment (CMC) will be designed and developed to support the U.S. and UK in development of the COLUMBIA and DREADNOUGHT SSBN programs enabling a common U.S.-UK CMC and maximizing the benefit of the ongoing U.S.-UK partnership in strategic deterrence. The COLUMBIA Class Program

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design	Project (Number/Name) 3220 / COLUMBIA Class Submarine Development
<p>RDT&E efforts will support the design, construction and operations & support portions of the program. RDT&E efforts will be performed by Navy laboratories, shipyards, private industry, and University Affiliated Research Centers.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design				Project (Number/Name) 3220 / COLUMBIA Class Submarine Development					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	SS/CPFF	Ship Design Contractor-EB : Groton, CT	1,866.271	153.040	Oct 2021	158.930	Oct 2022	97.839	Oct 2023	-		97.839	Continuing	Continuing	Continuing
Product Development	WR	NSWC : Carderock, MD	658.670	28.146	Oct 2021	20.106	Oct 2022	17.888	Oct 2023	-		17.888	Continuing	Continuing	Continuing
Product Development	WR	NSWC : Philadelphia, PA	115.970	13.415	Oct 2021	9.583	Oct 2022	8.021	Oct 2023	-		8.021	Continuing	Continuing	Continuing
Product Development	WR	NUWC : Newport, RI	164.183	20.540	Oct 2021	14.673	Oct 2022	11.960	Oct 2023	-		11.960	Continuing	Continuing	Continuing
Product Development	Various	NAVSEA : Various	314.625	25.458	Oct 2021	18.186	Oct 2022	15.221	Oct 2023	-		15.221	Continuing	Continuing	Continuing
Product Development	SS/CPFF	ARL Penn State University : State College, PA	3.811	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	NGMS : Sunnyvale, CA	200.763	0.500	Nov 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	JHU/APL : Laurel, MD	30.705	0.767	Nov 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	WR	NUWC : Keyport, WA	0.652	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	DRAPER : Cambridge, MA	10.166	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	LMRMS : Mitchel Field, NY	85.833	0.160	Nov 2021	0.232	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	C/CPFF	EMCUBE : Alexandria, VA	4.684	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	LMS : Sunnyvale, CA	120.344	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	JRC : Washington, DC	5.832	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	C/CPFF	GDMS : Pittsfield, MA	168.380	5.232	Oct 2021	4.576	Oct 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	WR	CNSW : China Lake, CA	82.243	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	IEC : Anaheim, CA	5.299	1.902	Feb 2022	1.295	Oct 2022	0.000		-		0.000	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design				Project (Number/Name) 3220 / COLUMBIA Class Submarine Development					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	WR	NSWC : Dahlgren, VA	27.876	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	BAE : Rockville, MD	52.310	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	BNA : Huntington Beach, CA	3.217	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	WR	NSWC Crane : Crane, IN	74.248	2.925	Nov 2021	8.095	Oct 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	GDEB : Groton, CT	9.421	1.095	Oct 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	Various	SSP : Various	19.804	0.575	Oct 2021	0.575	Oct 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	SPA : Alexandria, VA	12.550	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			4,037.857	253.755		236.251		150.929		-		150.929	Continuing	Continuing	N/A
Remarks															
There are no FY22 or FY23 UK common funds. Other FY23 updates reflect the approved 2021 cost estimate.															
Note: Various is used for multiple activities with different award dates.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Management Support	C/CPFF	Various : Multiple Awards	191.703	14.140	Nov 2021	14.049	Nov 2022	14.933	Nov 2023	-		14.933	Continuing	Continuing	Continuing
Government Management Support	WR	Various: NSWC : Carderock, MD	107.331	12.325	Oct 2021	10.111	Oct 2022	12.763	Oct 2023	-		12.763	Continuing	Continuing	Continuing
Government Management Support	WR	Various: NSWC : Philadelphia, PA	12.314	0.885	Oct 2021	1.240	Oct 2022	1.127	Oct 2023	-		1.127	0.000	15.566	-
Government Management Support	WR	Various: NUWC : Newport, RI	20.912	2.996	Oct 2021	2.625	Oct 2022	3.025	Oct 2023	-		3.025	0.000	29.558	-
Government Management Support	WR	Various: SUPSHIP : Groton, CT	17.011	3.431	Oct 2021	4.720	Oct 2022	2.962	Oct 2023	-		2.962	0.000	28.124	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design				Project (Number/Name) 3220 / COLUMBIA Class Submarine Development					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	WR	NAVSEA HQ : Washington, D.C.	3.399	0.001	Nov 2021	0.000	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			352.670	33.778		32.745		34.810		-		34.810	Continuing	Continuing	N/A
Remarks															
Since Lead ship authorization in 2021, Management Services requirements have been split funded 50/50% RDTE and SCN, with remaining balance funded with SCN full funding. FY22 & FY23 match the approved 2021 cost estimate.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			4,390.527	287.533		268.996		185.739		-		185.739	Continuing	Continuing	N/A
Remarks															
The listed Award Dates represent the date on which initial obligations occur for the effort.															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

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1319 / 4

R-1 Program Element (Number/Name)	Program Element Description	Program Element Status	Program Element Comments

PE 0603595N / SSBN New Design

Project (Number/Name)	Start Date	End Date	Duration (Days)	Team Lead	Status	Progress (%)	Budget (USD)	Actual Cost (USD)	Variance (USD)	Risk Level	Notes
101	2023-01-01	2023-03-15	74	John Doe	Completed	100	15000	14800	200	Low	Project completed ahead of schedule.
102	2023-02-01	2023-04-30	89	Jane Smith	In Progress	75	20000	21000	-1000	Medium	Minor budget overrun, on track for completion.
103	2023-03-01	2023-05-15	75	Mike Johnson	On Hold	20	18000	18000	0	High	Project paused due to resource allocation.
104	2023-04-01	2023-06-30	90	Sarah Lee	Planned	0	22000	22000	0	Medium	Project planning phase, start date confirmed.
105	2023-05-01	2023-07-15	75	David Kim	Completed	100	12000	11500	500	Low	Project completed successfully within budget.
106	2023-06-01	2023-08-31	91	Emily White	In Progress	60	25000	26000	-1000	Medium	Minor budget overrun, progress on schedule.
107	2023-07-01	2023-09-15	76	Chris Brown	On Hold	10	16000	16000	0	High	Project paused due to technical challenges.
108	2023-08-01	2023-10-31	91	Alex Green	Planned	0	28000	28000	0	Medium	Project planning phase, start date confirmed.
109	2023-09-01	2023-11-15	75	Mia Black	Completed	100	14000	13800	200	Low	Project completed ahead of schedule.
110	2023-10-01	2023-12-31	91	Noah Grey	In Progress	50	20000	20500	-500	Medium	Minor budget overrun, progress on schedule.

3220 / COLUMBIA Class Submarine Development

FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
			Ship Design Disclosure and Construction Data			
			Research, Development, and Prototyping for Lead Ship Design			
			Component Development / Component Qualification			
		Advanced Propulsor Bearing Prototype				
			Advanced Carbon Dioxide Removal Unit (ACRU)			
			Ship Class SCN Design			
			Lead Ship Construction			
						Trials/Cert/DASO/Test
FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028

DASO - Demonstration and Shakedown Operation
RDT&E - Research, Development, Test & Evaluation

SCN - Shipbuilding and Conversion, Navy

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design	Project (Number/Name) 3220 / COLUMBIA Class Submarine Development	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Notes: * Effort began prior to 1st Quarter FY 2021. ** Effort continues past 4th Quarter FY 2027</i>				
Ship Design Disclosure and Construction Data*	1	2022	2	2027
Research, Development, and Prototyping for Lead Ship Design*	1	2022	3	2027
Component Development / Component Qualification*	1	2022	3	2027
Advanced Propulsor Bearing Prototype *	1	2022	2	2024
Advanced Carbon Dioxide Removal Unit (ACRU)*	1	2022	3	2027
Ship Class SCN Design*, **	1	2022	4	2028
Lead Ship Construction**	1	2022	3	2027
Trials/DASO**	3	2027	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design				Project (Number/Name) 3440 / SBSD Obsolescence			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3440: SBSD Obsolescence	0.000	0.000	20.261	21.655	-	21.655	21.964	22.365	22.751	22.639	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 444												
Note Project 3440 (SBSD Obsolescence) is a new project in FY23. This project is not a new start but represents continuation of efforts previously executed under project 3220 in FY22 and earlier.												
A. Mission Description and Budget Item Justification This project provides the engineering development and program management effort required to sustain NPES outfitting of each ship of the COLUMBIA Class throughout the duration of the 12-ship construction program. Non-recurring engineering activity is required to ensure specification compliant components are available for procurement as fleet common sub-systems, which evolve over the life of the program due to either competitive selection of new suppliers, component obsolescence replacement, increased technical performance, or improvements in reliability. Non-recurring engineering activity is needed to perform platform integration of the components, and software modification to accommodate electronic data exchange, COLUMBIA unique submarine environment qualification, and update of all logistics products.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)							FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	
Title: Government Furnished/Contractor Furnished NPES Component Technology Refreshment Articles: FY 2023 Plans: - Evaluate NPES component obsolescence issues, and initiate construction risk mitigation actions. - Initiate re-design activity for components impacting ship safety/self-protect functions. - Program contract changes to procurement documentation affecting follow-on shipset acquisition. - Complete AN/BST-1 and AN/BRR-6 environmental qualification testing of redesigned components. - Continue environmental qualification testing of lead ship design Government Furnished Equipment. FY 2024 Base Plans: - Conduct simulation/stimulation equipment validation at the COATS construction test site for all GFE supplied sensors and simulators. - Conduct first of class NPES validation/verification of NPES Ship Systems manual and casualty procedures. - Continue to perform lab based cyber security testing of the lead ship NPES design at COATS. - Conduct find-fix-repair of NPES software defects discovered during COATS testing.							0.000	20.261	21.655	0.000	21.655	
							-	-	-	-	-	

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603595N / <i>SSBN New Design</i>		Project (Number/Name) 3440 / <i>SBSD Obsolescence</i>		
<u>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</u>						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Continue to perform incremental NPES sub-system integration testing with the Strategic Weapons Systems using simulators at vendor site visits.</p> <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Small increase represents restoration of total force management and the updated program cost estimate from 2021 capturing updated program estimates.</p>						
Accomplishments/Planned Programs Subtotals		0.000	20.261	21.655	0.000	21.655
<u>C. Other Program Funding Summary (\$ in Millions)</u> N/A						
<u>Remarks</u>						
<u>D. Acquisition Strategy</u> <p>The COLUMBIA Class Program RDT&E efforts will support the design, construction and operations & support portions of the program. RDT&E efforts will be performed by Navy laboratories, shipyards, private industry, and University Affiliated Research Centers.</p> <p>Project 3440 funding has been realigned from Project 3220 funding in FY23 and later to mimic the Virginia class submarine follow ship cost tracking model.</p>						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603595N / SSBN New Design

Project (Number/Name)

3440 / SBSD Obsolescence

Product Development (\$ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Product Development	SS/CPFF	Lockheed-Martin : Manassas, VA	0.000	0.000		5.947	Nov 2022	6.771	Nov 2023	-		6.771	Continuing	Continuing	Continuing
Product Development	WR	NUWC : Newport, RI	0.000	0.000		3.574	Oct 2022	3.529	Oct 2023	-		3.529	Continuing	Continuing	Continuing
Product Development	WR	NSWC : Philadelphia, PA	0.000	0.000		1.583	Oct 2022	1.800	Oct 2023	-		1.800	Continuing	Continuing	Continuing
Product Development	WR	NUWC : Keyport, WA	0.000	0.000		1.120	Oct 2022	1.955	Oct 2023	-		1.955	Continuing	Continuing	Continuing
Product Development	WR	NSWC Carderock : Bethesda, MD	0.000	0.000		0.517	Oct 2022	1.100	Oct 2023	-		1.100	Continuing	Continuing	Continuing
Product Development	SS/CPFF	GDEB : Groton, CT	0.000	0.000		3.510	Nov 2022	1.300	Nov 2023	-		1.300	Continuing	Continuing	Continuing
Product Development	SS/CPFF	Lockheed-Martin : Syracuse, NY	0.000	0.000		0.650	Nov 2022	0.750	Nov 2023	-		0.750	Continuing	Continuing	Continuing
Product Development	WR	NIWC LANT : Charleston SC	0.000	0.000		0.887	Oct 2022	1.400	Oct 2023	-		1.400	Continuing	Continuing	Continuing
Product Development	SS/CPFF	GDMS : Pittsfield, MA	0.000	0.000		0.750	Nov 2022	0.250	Nov 2023	-		0.250	Continuing	Continuing	Continuing
Product Development	SS/CPFF	GDMS : Fair Lakes, VA	0.000	0.000		0.815	Nov 2022	0.150	Nov 2023	-		0.150	Continuing	Continuing	Continuing
Product Development	WR	NSWC : Port Hueneme CA	0.000	0.000		0.050	Oct 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Product Development	SS/CPFF	Progeny Systems : Manassas, VA	0.000	0.000		0.858	Nov 2022	0.950	Nov 2023	-		0.950	Continuing	Continuing	Continuing
Product Development	WR	NIWC PAC : San Diego, CA	0.000	0.000		0.000		1.700	Oct 2023	-		1.700	0.000	1.700	-
Subtotal			0.000	0.000		20.261		21.655		-		21.655	Continuing	Continuing	N/A

Remarks

All non-recurring engineering development activity is performed using engineering services Contract Line Item Numbers (CLINs) from existing Original Equipment Manufacturer (OEM) contracts, or field activity direct tasking. Funding levels reflect the approved 2020/2021 cost estimate.

	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000	20.261	21.655	-	21.655	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy							Date: March 2023		
Appropriation/Budget Activity 1319 / 4			R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design			Project (Number/Name) 3440 / SBSD Obsolescence			
	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Remarks									

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy				Date: March 2023			
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design		Project (Number/Name) 3440 / SBSD Obsolescence	

FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
				Monitor all 15 major Non-Propulsion Electronic Systems (NPES) for technology obsolescence issues and formulate mitigation action plans																							
				Execute component re-design, component qualification, sub-system integration, and platform integration																							
FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design	Project (Number/Name) 3440 / SBSD Obsolescence	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3440				
* Effort began prior to 1st quarter FY 2021. ** Effort continues past 4th Quarter FY 2027.: Monitor all 15 major NPES for technology obsolescence issues and formulate mitigation action plans**	1	2023	4	2028
* Effort began prior to 1st quarter FY 2021. ** Effort continues past 4th Quarter FY 2027.: Execute component re-design, component qualification, sub-system integration, and platform integration**	1	2023	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design				Project (Number/Name) 3441 / SBSD Technology Refresh			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3441: SBSD Technology Refresh	0.000	0.000	46.724	49.682	-	49.682	50.497	51.365	52.321	52.056	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 444												
Note Project 3441 (SBSD Technology Refresh) is a new project in FY23. This project is not a new start but represents continuation of efforts previously executed under project 3220 in FY22 and earlier.												
A. Mission Description and Budget Item Justification This project encompasses ship system development, coordination, and management efforts for the COLUMBIA Class Submarine Technology Insertion Program and Technology Refresh Program over the life cycle. The purpose of the Technology Insertion Program is to efficiently upgrade performance of all hulls by virtue of improvements in HM&E ship systems. The purpose of the Technology Refresh Program is to develop, coordinate, and manage technical refresh plans for ship systems reliant on Commercial off the Shelf (COTS) technology that have short product life cycles to ensure materiel solutions for obsolescence issues. Additionally, this project will support mitigation of obsolescence issues for HM&E components that are not included in systems that have not historically had a formal Tech Refresh plan. Technology development implementation and logistics for developmental items, and COLUMBIA Class test & evaluation for these items are also included. Testing of components and systems will be used to inform performance predictions for later ships in the class and determine if design changes are needed. Technologies developed in this program will be considered for applicability to the VIRGINIA Program for commonality opportunities. The thrust of these efforts will be to maintain required technical performance and materiel readiness of COLUMBIA SSBNs in order to support the Sea Based Strategic Deterrence (SBSD) mission.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Hull, Mechanical, and Electrical Technical Refresh, Obsolescence Design, and Integration Efforts								0.000	28.034	29.875	0.000	29.875
Articles:								-	-	-	-	-
FY 2023 Plans: - Redesign components to mitigate obsolescence issues for HM&E to mitigate obsolescence issues during construction and initial fielding of the COLUMBIA Submarine Class. - Commence Tech Refresh for CFE Commercial Off the Shelf based systems and HM&E systems to mitigate obsolescence issues during construction and initial fielding of the COLUMBIA Submarine Class. - Develop long term Tech Refresh plans CFE and GFE HM&E systems to ensure material availability over the Life-cycle of the COLUMBIA Submarine Class.												
FY 2024 Base Plans: - Redesign components to mitigate obsolescence issues for CFE and GFE to mitigate obsolescence issues during construction and initial fielding of the COLUMBIA Submarine Class.												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design		Project (Number/Name) 3441 / SBSD Technology Refresh		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div>- Commence Tech Refresh for CFE Commercial Off the Shelf based systems and GFE systems to mitigate obsolescence issues during construction and initial fielding of the COLUMBIA Submarine Class.</div> <div>- Develop long-term Tech Refresh plans CFE and GFE HM&E systems to ensure material availability over the Life-cycle of the COLUMBIA Submarine Class.</div> <div>FY 2024 OCO Plans: N/A</div> <div>FY 2023 to FY 2024 Increase/Decrease Statement: Small increase represents restoration of total force management and the updated program cost estimate from 2021 capturing updated program estimates.</div>						
<div>Title: Systems Engineering, Test and Evaluation</div> <div>Articles:</div> <div>FY 2023 Plans: Systems Engineering, Test and Evaluation</div> <div>Ship Control and Hydrodynamics</div> <div>- Support incorporation of the Steady Flight Assist Algorithm in Ship Control Algorithm.</div> <div>- Support incorporation of Ship control algorithm with Hardware updates.</div> <div>- Support Ship Control Software FQT (Functional Qualification Testing) for Baseline revision 0.0.</div> <div>- A free running model test to support Characterization of CLB Operational Boundaries will be performed.</div> <div>- Characterization of CLB Operational Boundaries will continue including the validation of new modeling of near-surface behavior for various sea states (first and second order near surface forces).</div> <div>- Support substantial GFI deliveries to the shipbuilder for Ship's Systems Manual (SSM).</div> <div>Diesel Exhaust</div> <div>- Complete 5000 hours of Phase III Hot Corrosion Testing of the down selected material to verify its materialistic strength properties as the build material for the Diesel Exhaust.</div> <div>- Complete multiple iterations of the Phase III Fracture Toughness Testing of the down selected material to verify its materialistic fatigue properties as the build material for the Diesel Exhaust.</div> <div>Propulsors and Shafting</div> <div>- Conduct and support modal testing of as built propulsor components and assemblies.</div> <div>- Analyze modal testing data to inform and improve computational models and update performance predictions.</div>		0.000 -	18.690 -	19.807 -	0.000 -	19.807 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design		Project (Number/Name) 3441 / SBSD Technology Refresh		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Begin testing of propulsor bearing first production unit at Full Scale Bearing Test Facility to evaluate performance and generate design feedback.</p> <p>Signatures</p> <p>- System Software Build 2.0 and updated design efforts based on lessons learned from Future Naval Capability Demonstration effort.</p> <p>GFI Design Updates in accordance with ongoing design evolutions, obsolescence evaluation and improvements, and associated engineering efforts.</p> <p>FY 2024 Base Plans:</p> <p>Systems Engineering, Test and Evaluation</p> <p>Ship Control, Hydrodynamics and Shock</p> <p>- Continue support incorporation of Steady Flight Assist in Ship Control Algorithm.</p> <p>- Support certification of Ship control algorithm with Hardware updates.</p> <p>- Tasking will begin to pivot to support for SSM development requiring hundreds of simulation runs supporting SSM procedures.</p> <p>- Final free-running model test prior to FY28 Hydrodynamic Performance Trial (HPT) characterization cycle will be performed. The test will continue to support Characterization of CLB Operational Boundaries.</p> <p>- Characterization of CLB Operational Boundaries will continue.</p> <p>- Support the Large Vehicle Shock Test.</p> <p>Diesel Exhaust</p> <p>- Complete 5000 hours of Phase III Hot Corrosion Testing of the down selected material to verify its materialistic strength properties as the build material for the Diesel Exhaust.</p> <p>- Complete multiple iterations of the Phase III Fracture Toughness Testing of the down selected material to verify its materialistic fatigue properties as the build material for the Diesel Exhaust.</p> <p>Propulsor and Shafting</p> <p>- Continue modal testing of as built propulsor components and assemblies.</p> <p>- Continue analyzing modal testing data to inform and improve computational models, and update performance predictions.</p>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design		Project (Number/Name) 3441 / SBSD Technology Refresh		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Continue testing of propulsor bearing first production unit at Full Scale Bearing Test Facility to evaluate performance and generate design feedback.</p> <p>Signatures</p> <p>- Continue System Software Build 2.0 and updated design efforts based on lessons learned from Future Naval Capability Demonstration effort and ongoing design evolution.</p> <p>- Support Modeling efforts to improve prediction capabilities and support reviews/assessments of Shipbuilder products by Subject Matter Experts.</p> <p>Support GFI Design Updates in accordance with ongoing design evolutions, obsolescence evaluation and improvements, and associated engineering efforts.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase primarily due to planned shock test in FY24. Funding aligns with the updated program cost estimate from 2021 capturing updated program estimates.</p>						
Accomplishments/Planned Programs Subtotals		0.000	46.724	49.682	0.000	49.682
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
<p>The COLUMBIA Class Program RDT&E efforts will support the design, construction and operations & support portions of the program. RDT&E efforts will be performed by Navy laboratories, shipyards, private industry, and University Affiliated Research Centers.</p> <p>Project 3441 funding has been realigned from Project 3220 funding in FY23 and later to mimic the Virginia class submarine follow ship cost tracking model.</p>						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design				Project (Number/Name) 3441 / SBSD Technology Refresh					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	Various	NSWC Carderock : Bethesda, MD	0.000	0.000		7.681	Oct 2022	14.348	Oct 2023	-		14.348	Continuing	Continuing	Continuing
Product Development	Various	JHU/APL : Laurel, MD	0.000	0.000		0.645	Oct 2022	0.250	Oct 2023	-		0.250	Continuing	Continuing	Continuing
Product Development	Various	NRL : Washington, DC	0.000	0.000		3.494	Nov 2022	3.534	Nov 2023	-		3.534	Continuing	Continuing	Continuing
Product Development	TBD	GDEB : Groton, CT	0.000	0.000		31.101	Nov 2022	27.009	Nov 2023	-		27.009	Continuing	Continuing	Continuing
Product Development	Various	NSWC : Philadelphia, PA	0.000	0.000		1.588	Oct 2022	1.736	Oct 2023	-		1.736	Continuing	Continuing	Continuing
Product Development	Various	ARL PSU : State College, PA	0.000	0.000		2.215	Nov 2022	2.805	Nov 2023	-		2.805	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		46.724		49.682		-		49.682	Continuing	Continuing	N/A
Remarks															
The listed Award Dates represent the date on which initial obligations occur for the effort. Funding levels reflect the approved 2021 cost estimate and updated inflation/rates values.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		46.724		49.682		-		49.682	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy						Date: March 2023
Appropriation/Budget Activity 1319 / 4			R-1 Program Element (Number/Name) PE 0603595N / <i>SSBN New Design</i>			Project (Number/Name) 3441 / <i>SBSD Technology Refresh</i>

FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
				Hydrodynamics		
				Ship Control		
				Signatures		
			Diesel Exhaust Phase III Testing			
				Propulsor and Shaffing		
			Shock Testing			
				GFI Design Upgrades		
					Monitor, redesign, and qualify CFE and GFE for HM&E components to mitigate obsolescence issues	
					Develop and implement tech refresh plans for 20 CFE and GFE HM&E systems	
FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603595N / SSBN New Design

Project (Number/Name)

3441 / SBSD Technology Refresh

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3441				
* Effort began prior to 1st quarter FY 2021. ** Effort continues past 4th Quarter FY 2027.: Hydrodynamics**	1	2023	4	2028
* Effort began prior to 1st quarter FY 2021. ** Effort continues past 4th Quarter FY 2027.: Ship Control **	1	2023	4	2028
* Effort began prior to 1st quarter FY 2021. ** Effort continues past 4th Quarter FY 2027.: Signatures**	1	2023	4	2028
* Effort began prior to 1st quarter FY 2021. ** Effort continues past 4th Quarter FY 2027.: Diesel Exhaust	1	2023	4	2025
* Effort began prior to 1st quarter FY 2021. ** Effort continues past 4th Quarter FY 2027.: Propulsor and Shafting**	1	2023	4	2028
* Effort began prior to 1st quarter FY 2021. ** Effort continues past 4th Quarter FY 2027.: Shock Testing	1	2024	4	2024
* Effort began prior to 1st quarter FY 2021. ** Effort continues past 4th Quarter FY 2027.: GFI Design Upgrades**	1	2023	4	2028
* Effort began prior to 1st quarter FY 2021. ** Effort continues past 4th Quarter FY 2027.: Monitor, redesign, and qualify CFE and GFE for HM&E components to mitigate obsolescence issues	1	2023	4	2027
* Effort began prior to 1st quarter FY 2021. ** Effort continues past 4th Quarter FY 2027.: Develop and implement tech refresh plans for 20 CFE and GFE HM&E systems	1	2023	4	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603595N / <i>SSBN New Design</i>				Project (Number/Name) 9999 / <i>Congressional Adds</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	0.000	14.471	9.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	23.471
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification
 FY22 Congressional Adds support the continued development of composite materials and also provides funding for COLUMBIA Digital Environment development.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023
<i>Congressional Add:</i> Rapid composites for wet submarine application <i>FY 2022 Accomplishments:</i> Manufacturing process development and demonstration of composite materials for submarine propulsor, and shafting components at large scale and full scale. <i>FY 2023 Plans:</i> Continue manufacturing process development and demonstration of composite materials for submarine propulsor and shafting components at large scale and full scale.	9.647	9.000
<i>Congressional Add:</i> Columbia digital environment <i>FY 2022 Accomplishments:</i> Funding is used to convert the digital deliverables provided by the design yard into a government hosted 3D interactive digital twin to support efficient logistics, maintenance, and training processes. <i>FY 2023 Plans:</i> '- Develop and configure cloud-based capabilities for hosting CLB 3D digital twin models. - Develop Digital Threads from Design/Planning Yards to enable automated export and model build process. - Master Job File development pilot leveraging gov-hosted CLB design data/digital twin to develop CLB work packages for planned maintenance requirements. - Integrate CLB model in containerized rendering software compatible with accredited Naval Nuclear Propulsion Information (NNPI) cloud, local, and disconnected deployments (environment agnostic).	4.824	0.000
Congressional Adds Subtotals	14.471	9.000

C. Other Program Funding Summary (\$ in Millions)
 N/A

Remarks

D. Acquisition Strategy
 N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design				Project (Number/Name) 9999 / Congressional Adds					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	SS/CPFF	Seeman Composites : Gulfport, MS	0.000	4.148	May 2022	0.000		0.000		-		0.000	0.000	4.148	-
Product Development	SS/CPFF	Seeman Comp. : Gulfport, MS	0.000	1.640	Aug 2022	0.000		0.000		-		0.000	0.000	1.640	-
Product Development	WR	NSWC/Carderock : Carderock, MD	0.000	3.859	Apr 2022	9.000	Sep 2023	0.000		-		0.000	0.000	12.859	-
Product Development	C/FFP	Beast Code : Fort Walton Beach, FL	0.000	4.824	Jul 2022	0.000		0.000		-		0.000	0.000	4.824	-
Subtotal			0.000	14.471		9.000		0.000		-		0.000	0.000	23.471	N/A
Remarks															
The listed Award Dates represent the date on which initial obligations occur for the effort.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	14.471		9.000		0.000		-		0.000	0.000	23.471	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy												Date: March 2023																			
Appropriation/Budget Activity 1319 / 4												R-1 Program Element (Number/Name) PE 0603595N / SSBN New Design				Project (Number/Name) 9999 / Congressional Adds															
FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028							
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
C756: Rapid Composites for Wet Submarine Application																															

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603595N / <i>SSBN New Design</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
C756: Rapid Composites for Wet Submarine Application: Propulsor Component Manufacturing Demonstration and Ship Integration Studies	3	2022	4	2023
C756: Rapid Composites for Wet Submarine Application: Shafting and Bearing Manufacturing Demonstration	3	2022	3	2023
C756: Rapid Composites for Wet Submarine Application: Propulsor Component Manufacturing Demonstration	4	2022	4	2023
C756: Rapid Composites for Wet Submarine Application: Composite Propulsor Component Test and Evaluation	2	2023	4	2023
C757: Columbia Digital Environment: Develop Digital Threads from Design/Planning Yards	4	2022	3	2024
C757: Columbia Digital Environment: Develop Process to Deploy Onboard Submarines (testing w/ in-service submarines)	4	2022	3	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	897.110	75.189	31.707	31.464	-	31.464	29.472	33.538	43.385	46.173	Continuing	Continuing
2550: Mine Countermeasure (MCM) Mission Package	105.734	49.776	19.963	16.971	-	16.971	15.639	18.842	11.957	12.092	Continuing	Continuing
2551: Anti-Submarine Warfare (ASW) Mission Package	103.030	16.832	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	119.862
2552: Surface Warfare (SUW) Mission Package	35.760	0.000	3.000	0.851	-	0.851	0.000	0.000	0.000	0.000	0.000	39.611
3129: LCS Mission Package Development	652.586	8.581	8.744	13.642	-	13.642	13.833	14.696	31.428	34.081	Continuing	Continuing
Program MDAP/MAIS Code: Project MDAP/MAIS Code(s): 443												
A. Mission Description and Budget Item Justification												
The Littoral Combat Ship (LCS) Mission Modules (MM) Program Element (PE) provides funds for detailed design, development, issue resolution, certification, integration, and testing of the LCS MM. LCS is a fast, agile, and networked surface combatant with capabilities optimized to defeat asymmetric threats, and ensure naval and joint force access into contested littoral regions. It uses open-systems architecture design, modular weapons, sensor systems, and a variety of manned and unmanned vehicles to expand the battle space and project offensive power into the littorals.												
The LCS MM Program employs an incremental development approach to deliver capability, which allows for insertion of mature capabilities throughout the life of the program without the need for modifications to the seaframes. Future capabilities will be considered when joint warfighting objectives or changing threats create new operational capability requirements that cannot be met by current mission package designs, or when new technological opportunities allow significant progress toward delivering cost effective, enhanced capabilities. Future mission module increments can be tested, constructed, and incorporated into existing mission packages, which is one of the most important benefits of LCS modular design.												
Mission Package funding is aligned into four (4) projects: 2550 Mine Countermeasures (MCM) Mission Package 2551 Anti-Submarine Warfare (ASW) Mission Package 2552 Surface Warfare (SUW) Mission Package 3129 LCS Mission Package Development												

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules				
MCM MP: Counters bottom, tethered, near surface, and surface mines in the littorals without putting sailors in the minefield. In FY24, the MCM MP will conduct Cyber Security testing of the MCM MP, develop MCM MPAS 4.0 software, modify the MCM MP to commence integration of Barracuda, development of the Near Surface Neutralization Module (NSN) and TBEC design upgrades.						
SUW MP: Increases firepower and offensive/defensive capabilities against large numbers of highly maneuverable, fast, small craft threats, giving LCS the ability to protect the sea lanes while moving a force quickly through a choke point or other strategic waterway, and to conduct maritime security missions. In FY24, the SUW MP will complete the efforts to revise the SSMM hatch and cover design. In FY24, project 3129 (LCS Mission Package Common Development) efforts include continuing MPCE v2.0 tech refresh development and initiation of MVCS v1.X tech refresh development.						
ASW MP: Enables the LCS to conduct detect-to-engage operations against modern submarines. In FY23, the ASW Mission Package will be divested from the LCS Mission Modules program.						
C5I: Enabling products required by all MPs such as common hardware interfaces, computer operating environment (Mission Package Computing Environment (MPCE)), communications systems (Multi-Vehicle Communications System (MVCS)), aviation interface systems, and Mission Package Portable Control Stations (MPPCS). MPCE provides common services and an Operating Environment to support all Mission Package Application Software (MPAS) and Open Architecture Products. MVCS enables the simultaneous control and data exchange between unmanned mission vehicles and the ship. Aviation interface systems include integration and management of data communications, data processing, and physical hardware interfaces such as common equipment and containers used by all mission packages. MPPCS provides a mobile operating environment installed in a 20ft ISO container and serves as a surrogate ship during mission package development and integration test events at test ranges.						
B. Program Change Summary (\$ in Millions)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget		75.995	41.533	39.758	-	39.758
Current President's Budget		75.189	31.707	31.464	-	31.464
Total Adjustments		-0.806	-9.826	-8.294	-	-8.294
• Congressional General Reductions		-	-			
• Congressional Directed Reductions		-	-16.826			
• Congressional Rescissions		-	-			
• Congressional Adds		-	7.000			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-0.806	0.000			
• Program Adjustments		0.000	0.000	-9.075	-	-9.075
• Rate/Misc Adjustments		0.000	0.000	0.781	-	0.781

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules	
<p>Change Summary Explanation</p> <p>FY23 Congressional reductions: [-\$14.826M] for ASW Mission Package (MP) termination, [-\$2.000M] for LCS MP DevSecOps development maintain level of effort.</p> <p>FY23 Congressional increase: [+\$7.000M] for Mine Countermeasures Mission Package to increase weight capacity of the Twin Boom Extensible Crane (TBEC) to support increased MCM USV endurance and OP-4 requirements for Barracuda.</p> <p>FY24 programmatic adjustments support divestment from ASW MP.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules				Project (Number/Name) 2550 / Mine Countermeasure (MCM) Mission Package			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2550: Mine Countermeasure (MCM) Mission Package	105.734	49.776	19.963	16.971	-	16.971	15.639	18.842	11.957	12.092	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 443												

A. Mission Description and Budget Item Justification

The MCM Mission Package (MP) employs an incremental development approach to deliver capability which allows the continued insertion of mature capabilities throughout the life of the program without the need for modifications to the seaframes. The focus is to minimize service life extensions to both MCM-1 ships and the MH-53E helicopters. Future MCM MP capabilities will be considered when joint warfighting objectives or changing threats create new operational capability requirements that cannot be met by current mission package designs, or when new technological opportunities allow significant progress toward delivering cost effective enhanced capabilities. Future mission module increments can be tested, constructed, and incorporated into existing mission packages, one of the most important benefits of LCS modular design. MCM MP successfully completed IOT&E in Q4FY22 and will achieve Initial Operational Capability (IOC) in Q2FY23.

The program has begun investigation into the feasibility of integrating the MCM MP on Vessels of Opportunity (VOO). In FY19 and FY20, the program demonstrated the flexibility of the modular MCM MP components by conducting a MCM Vessel of Opportunity (VOO) at-sea demonstration onboard the USS Hershel "Woody" Williams (T-ESB 4).

The MCM MP will counter deep, shallow, and tethered mines in the littorals without putting sailors in the minefield. When the MCM MP is embarked, LCS is capable of conducting detect-to-engage operations (hunting, sweeping, and neutralization) against very shallow to deep-water sea mine threats and detect mines in the Beach Zone. The MCM MP provides these capabilities through the use of sensors and weapons deployed from an MH-60S multi-mission helicopter, unmanned offboard vehicles, and support equipment/containers. The MCM MP consists of the following modules:

- Unmanned Minesweeping (UMS) Module: Unmanned Influence Sweeping System (UISS) (USV + Minesweeping Payload Delivery System (PDS))
- Airborne Mine Neutralization (AMN) Module: Airborne Mine Neutralization System (AMNS) + MH-60S helicopter
- Near Surface Detection (NSD) Module: Airborne Laser Mine Detection System (ALMDS) + MH-60S helicopter
- Coastal Mine Reconnaissance (CMR) Module: Coastal Battlefield Reconnaissance & Analysis (COBRA) + MQ-8 Fire Scout Vertical Take-off and Landing Tactical Unmanned Aerial Vehicle (VTUAV)
- Buried Minehunting (BMH) Module: Knifefish Unmanned Undersea Vehicle (UUV)
- Remote Minehunting (RMH) Module: Unmanned Surface Vehicle (USV) + Minehunting PDS + AN/AQS-20 Minehunting Sonar
- Near-surface Mine Neutralization (NSN) Module: Barracuda (Barracuda Neutralizer + USV + Mine Neutralization PDS)

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules		Project (Number/Name) 2550 / Mine Countermeasure (MCM) Mission Package		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Mine Countermeasures (MCM) Mission Modules		49.776	19.963	16.971	0.000	16.971
Articles:		-	-	-	-	-
FY 2023 Plans:						
<ul style="list-style-type: none">- Design a sufficient reinforcement to the LCS IND Twin Boom Extendable Crane (TBEC) foundations and upgrade components within the TBEC system to allow LCS to launch and recover a fully-fueled and ordnance-loaded Mine Countermeasures (MCM) Unmanned Surface Vessel through Sea State conditions.- Ensure TBEC is improved to meet required safety margins to meet OP-4 weapons handling requirements.- Improve TBEC software and HMI to address variety issues and support integration of new vehicle- Commence development of CONOPS for the Near Surface Neutralization Module (NSN)- Document top level requirements and preliminary design efforts for Mine Neutralization Module as part of MCM MP- Commence certification effort s for the MCM MP Continue development of the MCM MP training package from interim training to Navy schoolhouse supported training to support the establishment of Ready for Training (RFT)- Continue developing the LCS MCM MP Logistic products and training material, including technical manuals and provisioning documentation.- Improve usability and effectiveness of Integrated Contact Management.						
FY 2024 Base Plans:						
<ul style="list-style-type: none">- Certify MCM MP for deployment.- Develop work package to increase weight capacity of the Twin Boom Extensible Crane (TBEC) to support increased MCM USV endurance.- Integration of Common Control Station (CCS) into MCM MPAS 4.0- Develop Data Management Plan for collection and storage for MCM MP.- Certify the LCS MCM MP Logistic products and training material, including technical manuals and provisioning documentation.- Deliver and install Common PMA into LCS MPCE Hardware- Commence development of USV Support Container- Conduct engineering study to evaluation the MPAS architecture to accept Barracuda Software (weapons fire control circuit)- Integration and further development of all MCM MP Tactics- Integration and further development of all MCM MP Training						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603596N / <i>LCS Mission Modules</i>		Project (Number/Name) 2550 / <i>Mine Countermeasure (MCM) Mission Package</i>	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each) - Support Fleet experimentation with Beyond Line Of Sight (BLOS) and other MCM capabilities with Unmanned Systems FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: The decrease in FY2024 slows integration of Barracuda into the MCM MP.	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
	Accomplishments/Planned Programs Subtotals				

C. Other Program Funding Summary (\$ in Millions)											
	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPN 1600: <i>LCS Common Mission Modules Equipment</i>	63.501	54.883	49.060	-	49.060	44.214	37.226	32.276	32.991	360.231	1,258.966
• OPN 1601: <i>LCS MCM Mission Modules</i>	30.119	92.495	93.961	-	93.961	122.654	103.972	59.906	61.344	1,508.277	2,664.640

Remarks

D. Acquisition Strategy
 The LCS MM Acquisition Strategy employs an incremental procurement approach to allow for the rapid introduction of additional capabilities as system technology matures. This phased plan provides incremental fielding of capability as technology is matured, into the MCM MP until the full baseline capability defined in the Capability Development Document (CDD) is reached.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules				Project (Number/Name) 2550 / Mine Countermeasure (MCM) Mission Package					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MCM MP	WR	NSWC PCD : Panama City, FL	37.571	35.682	Oct 2021	9.901	Nov 2022	14.251	Nov 2023	-		14.251	Continuing	Continuing	Continuing
MCM MP	Sub Allot	PMS 406 : Various	7.650	0.000		0.000		0.000		-		0.000	0.000	7.650	-
MCM MP	Sub Allot	PMS 495 : Various	1.000	0.000		0.000		0.000		-		0.000	2.400	3.400	-
MCM MP	WR	NSWC PHD : Port Hueneme, CA	9.571	0.000		1.154	Dec 2022	0.500	Nov 2023	-		0.500	12.800	24.025	-
MCM MP	C/CPFF	Northrop Grumman : Bethpage, NY	17.347	2.700	Oct 2021	0.800	Nov 2022	1.338	Dec 2023	-		1.338	2.100	24.285	-
MCM MP TBEC Modifications	WR	NSWC PD : Philadelphia, PA	0.000	0.000		1.000	Apr 2023	0.000		-		0.000	0.000	1.000	-
MCM MP TBEC Modifications	C/CPIF	Various : Various	0.000	0.000		2.500	Jun 2023	0.000		-		0.000	0.000	2.500	-
MCM MP Mine Neutralization	WR	NSWC PCD : Panama City, FL	0.000	0.000		3.500	Apr 2023	0.000		-		0.000	0.000	3.500	-
Subtotal			73.139	38.382		18.855		16.089		-		16.089	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC PCD : Panama City, FL	26.765	0.000		0.000		0.000		-		0.000	0.000	26.765	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC PHD : Port Hueneme, CA	4.432	10.572	Oct 2021	0.250	Oct 2022	0.000		-		0.000	0.000	15.254	-
Subtotal			31.197	10.572		0.250		0.000		-		0.000	0.000	42.019	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules						Project (Number/Name) 2550 / Mine Countermeasure (MCM) Mission Package			
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MCM Program Management	C/CPFF	Booz Allen Hamilton : Washington, DC	1.398	0.822	Oct 2021	0.858	Jan 2023	0.882	Nov 2023	-		0.882	0.858	4.818	-
Subtotal			1.398	0.822		0.858		0.882		-		0.882	0.858	4.818	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			105.734	49.776		19.963		16.971		-		16.971	Continuing	Continuing	N/A
Remarks															

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PE 0603596N: *LCS Mission Modules*
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R-1 Program Element (Number/Name)
PE 0603596N / LCS Mission Modules

Project (Number/Name) 2550 / Mine Countermeasure (MCM) Mission Package

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603596N / <i>LCS Mission Modules</i>	Project (Number/Name) 2550 / <i>Mine Countermeasure (MCM) Mission Package</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 2550</i>				
MCM Integration and Testing on Independence Variant: MCM USV + MH IOT&E	4	2022	4	2022
MCM Integration and Testing on Independence Variant: OT-C10 IOT&E	4	2022	4	2022
MCM Integration and Testing on Independence Variant: MCM MP IOC	2	2023	2	2023
MCM Integration and Testing on Independence Variant: MCM MP Cyber Planning & Test	4	2023	4	2023
MCM Integration and Testing on Independence Variant: MCM MP Cyber OT	3	2024	3	2024
MCM Integration and Testing on Independence Variant: Post Test MPAS Find-Fix-Repair	1	2024	4	2026
MCM Integration and Testing on Independence Variant: TBEC Modification	2	2023	4	2024
MCM Integration and Testing on Independence Variant: MN PDS Integration	1	2025	4	2026
Follow-on Efforts: Barracuda Software Integration	1	2025	1	2026
Follow-on Efforts: Near Surface Neutralization (NSN) Module Integration	1	2026	1	2028
Follow-on Efforts: Near Surface Neutralization (NSN) Module Integration Testing	1	2028	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules				Project (Number/Name) 2551 / Anti-Submarine Warfare (ASW) Mission Package			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2551: Anti-Submarine Warfare (ASW) Mission Package	103.030	16.832	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	119.862
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 443												

A. Mission Description and Budget Item Justification

In FY23, the LCS ASW MP will be divested in alignment with the planned decommissioning of LCS class ships. FY23 events will occur simultaneously with divestment of the LCS ASW MP.

The ASW MP enables LCS to conduct detect-to-engage operations against submarines. Specific ASW capabilities include protecting forces in transit, protecting joint operating areas, and establishing ASW barriers. The ASW MP provides the warfighter capabilities that can be employed for ASW area search as well as high value unit escort missions. Key components of the ASW MP include a Variable Depth Sonar, a Multi-Function Towed Array and sonar signal processing systems. The individual systems are combined into modules: an ASW Escort Mission Module (EMM) that provides High Value Unit (HVU) escort capability and an Aviation Module that offers airborne threat localization and engagement capability through a MH-60R with MK54 torpedoes.

This project delivered the ASW EMM Pre-Production Test Article (PPTA) and the Aviation Module in Q1 FY19. Following the delivery of the PPTA, the ASW MP was installed on board a Freedom variant hull in Q4 FY19 to support Developmental Testing (DT). The project conducted DT on USS Fort Worth (LCS 3) in FY20 and FY21. In FY21, design updates were incorporated to improve reliability and hydrodynamic performance in turns and at higher speeds. Testing at the end of FY21 indicated hydrodynamic and transducer issues had not be resolved.

In FY22, the program continued hydrodynamic maturation efforts for the PPTA through land-based test events held at the Large Cavitation Channel (LCC) and implementation of an active control solution. Testing at Seneca Lake to show improved transducer reliability was also conducted. The Program is also planning to conduct a foreign comparative test of an alternate ASW payload on an Unmanned Surface Vehicle (USV) as part of a NATO exercise.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Anti-Submarine Warfare (ASW) Mission Modules	16.832	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2023 Plans: N/A					
FY 2024 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules		Project (Number/Name) 2551 / Anti-Submarine Warfare (ASW) Mission Package	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A					
FY 2024 OCO Plans:					
N/A					
Accomplishments/Planned Programs Subtotals	16.832	0.000	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPN 1600: LCS Common Mission Modules Equipment	63.501	54.883	49.060	-	49.060	44.214	37.226	32.276	32.991	360.231	1,258.966
• OPN 1602: LCS ASW Mission Modules	1.565	3.594	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	68.135

Remarks

D. Acquisition Strategy

The LCS MM Acquisition Strategy is employing an incremental procurement approach to allow for the rapid introduction of additional capabilities as system technology matures. This phased plan provides incremental fielding of capability through the introduction of mature programs of record into the respective Mission Packages until the full baseline capability defined in the Capability Development Document (CDD) is reached.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules				Project (Number/Name) 2551 / Anti-Submarine Warfare (ASW) Mission Package					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
2.0 ASW MP	Various	PEO IWS 5E : Various	1.650	0.000		0.000		0.000		-		0.000	0.000	1.650	-
2.0 ASW MP	WR	NUWC NPT : Newport RI	5.780	3.150	Nov 2021	0.000		0.000		-		0.000	0.000	8.930	-
2.0 ASW MP	WR	NIWC : San Diego, CA	1.000	0.000		0.000		0.000		-		0.000	0.000	1.000	-
2.0 ASW MP	C/CPFF	Northrop Grumman : Bethpage, NY	4.300	0.000		0.000		0.000		-		0.000	0.000	4.300	-
2.0 ASW MP	Sub Allot	PEO IWS 5A : Various	38.657	5.647	Mar 2022	0.000		0.000		-		0.000	0.000	44.304	-
2.0 ASW MP	C/CPFF	CACI : Washington, DC	0.255	0.000		0.000		0.000		-		0.000	0.000	0.255	-
2.0 ASW MP	WR	NSWC DD : Dahlgren, VA	0.225	0.000		0.000		0.000		-		0.000	0.000	0.225	-
2.0 ASW MP	WR	SUPSHIP Bath : Bath, Me	3.421	0.000		0.000		0.000		-		0.000	0.000	3.421	-
2.0 ASW MP	MIPR	NAWC WD : Point Mugu, CA	0.410	0.000		0.000		0.000		-		0.000	0.000	0.410	-
2.0 ASW MP	C/FFP	Raytheon : Portsmouth, RI	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
2.0 ASW MP	C/CPFF	Huntington Ingalls Industry : Pascagoula MS	2.200	0.000		0.000		0.000		-		0.000	0.000	2.200	-
ASW USV Demo	C/CPFF	TBD : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Subtotal			57.898	8.797		0.000		0.000		-		0.000	0.000	66.695	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
2.0 ASW MP	WR	NUWC KPT : Keyport, Wa	2.150	1.050	Dec 2021	0.000		0.000		-		0.000	0.000	3.200	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules				Project (Number/Name) 2551 / Anti-Submarine Warfare (ASW) Mission Package					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			2.150	1.050		0.000		0.000		-		0.000	0.000	3.200	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	COMOPTEVFOR : Norfolk, VA	1.300	0.600	Nov 2021	0.000		0.000		-		0.000	0.000	1.900	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC PHD : Port Hueneme, Ca	7.796	1.500	Dec 2021	0.000		0.000		-		0.000	0.000	9.296	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	Range Service : Var*	7.454	0.000		0.000		0.000		-		0.000	0.000	7.454	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NUWC NPT : Newport, RI	14.934	0.850	Nov 2021	0.000		0.000		-		0.000	0.000	15.784	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NUWC KPT : Keyport, Wa	5.100	0.000		0.000		0.000		-		0.000	0.000	5.100	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	C/CPFF	Raytheon : Portsmouth, RI	3.300	1.888	Dec 2021	0.000		0.000		-		0.000	0.000	5.188	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	C/CPFF	Northrop Grumman : Bethpage, NY	1.300	1.500	Dec 2021	0.000		0.000		-		0.000	0.000	2.800	-
Subtotal			41.184	6.338		0.000		0.000		-		0.000	0.000	47.522	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules				Project (Number/Name) 2551 / Anti-Submarine Warfare (ASW) Mission Package					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
2.0 ASW MP	C/CPIF	Booz Allen Hamilton : Washington, DC	1.798	0.647	Jan 2022	0.000		0.000	Nov 2023	-		0.000	0.000	2.445	-
Subtotal			1.798	0.647		0.000		0.000		-		0.000	0.000	2.445	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			103.030	16.832		0.000		0.000		-		0.000	0.000	119.862	N/A
Remarks FY 2018 and prior funding in Project 3129.															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy											Date: March 2023																	
Appropriation/Budget Activity 1319 / 4									R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules								Project (Number/Name) 2551 / Anti-Submarine Warfare (ASW) Mission Package											
Proj 2551	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
ASW MP AxB Development Process																												
	ACB-19 with TI-20																											
ASW MP Divestment Efforts																												
	Stop ASW Development																											
	DEMO																											
					Divestment																							
																					</							

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules	Project (Number/Name) 2551 / Anti-Submarine Warfare (ASW) Mission Package

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2551				
ASW MP AxB Development Process: ACB-19 with TI-20	1	2022	4	2022
ASW MP Divestment Efforts: Stop ASW Development	2	2022	2	2022
ASW MP Divestment Efforts: USV ASW Payload Demonstrations	1	2022	4	2023
ASW MP Divestment Efforts: ASW MP Divestment Efforts	1	2023	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules				Project (Number/Name) 2552 / Surface Warfare (SUW) Mission Package			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2552: Surface Warfare (SUW) Mission Package	35.760	0.000	3.000	0.851	-	0.851	0.000	0.000	0.000	0.000	0.000	39.611
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 443												
A. Mission Description and Budget Item Justification												
The SUW MP increases firepower and offensive/defensive capabilities against large numbers of highly maneuverable, fast, small craft threats, giving LCS the ability to protect the sea lanes and move a force quickly through a choke point or other strategic waterway. The SUW MP is composed of several mission modules including the Gun Mission Module (GMM), the Aviation Module, the Maritime Security Module (MSM), and the Surface-to-Surface Missile Module (SSMM). The GMM is composed of two high velocity 30mm cannons which is augmented by the ship's resident 57mm gun to counter close in to mid-range threats. The Aviation Module uses the embarked MH-60R helicopter with Hellfire missile and the MQ-8B Fire Scout VTUAV for the detection, identification, and classification of surface contacts and to engage long range threats. The MSM supports the embarkation of a Visit, Board, Search, and Seizure (VBSS) team. The SSMM is a self-contained module consisting of 2 Missile Exhaust Containment Structures (MECS), integrated articulating hatch covers, a fire control system, and 12 two-rail MK 210 launchers to support load out and firing of 24 Longbow Hellfire missiles. SSMM provides missile coverage for mid-range threats and small boats.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Surface Warfare (SUW) Mission Modules Articles: FY 2023 Plans: - Conduct shock qualification testing of the SSMM. This testing is required to meet the shock hardening verification requirement for the SSMM and the ship shock certification requirement documented in OPNAVINST 9072.2A. - Hatch Cover Modification and Design: Revise the current SSMM hatch and cover design to address water leaking, hatch heaters, manual hatch opening, Heat Sensing Devices (HSD) relocation, new hatch stops, fall restraint staples, and limit switch changes. FY 2024 Base Plans: Complete SSMM Hatch Modification Development & Design FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement:								0.000	3.000	0.851	0.000	0.851
								-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules		Project (Number/Name) 2552 / Surface Warfare (SUW) Mission Package	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
The decrease from FY2023 to FY2024: Shock Qualification in completed in FY2023.									
Accomplishments/Planned Programs Subtotals					0.000	3.000	0.851	0.000	0.851

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• OPN 1600: LCS Common Mission Module Equipment	63.501	54.883	49.060	-	49.060	44.214	37.226	32.276	32.991	360.231	1,258.966
• OPN 1603: LCS SUW Mission Module	3.395	5.100	12.102	-	12.102	11.101	3.500	0.100	0.146	14.236	251.663
• WPN 4221: LCS Module Weapons	2.121	4.580	3.264	-	3.264	2.463	2.266	2.258	2.322	63.142	122.403

Remarks

D. Acquisition Strategy

The LCS MM Acquisition Strategy is employing an incremental procurement approach to allow for the rapid introduction of additional capabilities as system technology matures. This phased plan provides incremental fielding of capability through the introduction of mature programs of record into the respective Mission Packages until the full baseline capability defined in the Capability Development Document (CDD) is reached.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules				Project (Number/Name) 2552 / Surface Warfare (SUW) Mission Package					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
3.0 SUW MP	MIPR	JAMS PO : Various	2.250	0.000		0.000		0.000		-		0.000	0.000	2.250	-
3.0 SUW MP	WR	NSWC DD : Dahlgren, VA	7.465	0.000		3.000	Nov 2022	0.851	Nov 2023	-		0.851	0.000	11.316	-
Subtotal			9.715	0.000		3.000		0.851		-		0.851	0.000	13.566	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
3.0 SUW MP	C/CPIF	Northrop Grumman : Bethpage, NY	2.600	0.000		0.000		0.000		-		0.000	0.000	2.600	-
3.0 SUW MP	WR	NSWC PHD : Port Hueneme, CA	2.000	0.000		0.000		0.000		-		0.000	0.000	2.000	-
Subtotal			4.600	0.000		0.000		0.000		-		0.000	0.000	4.600	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	Sub Allot	NSWC PHD : Port Hueneme, CA	5.778	0.000		0.000		0.000		-		0.000	0.000	5.778	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC Corona : Corona, CA	1.950	0.000		0.000		0.000		-		0.000	0.000	1.950	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC DD : Dahlgren, VA	11.553	0.000		0.000		0.000		-		0.000	0.000	11.553	-
Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E)	WR	COMOPTEVFOR : Norfolk, VA	0.800	0.000		0.000		0.000		-		0.000	0.000	0.800	-
Subtotal			20.081	0.000		0.000		0.000		-		0.000	0.000	20.081	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules						Project (Number/Name) 2552 / Surface Warfare (SUW) Mission Package			
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
3.0 SUW MP	C/CPIF	Booz Allen Hamilton : Washington, DC	1.364	0.000		0.000		0.000		-		0.000	0.000	1.364	-
Subtotal			1.364	0.000		0.000		0.000		-		0.000	0.000	1.364	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			35.760	0.000		3.000		0.851		-		0.851	0.000	39.611	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy										Date: March 2023																						
Appropriation/Budget Activity 1319 / 4										R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules								Project (Number/Name) 2552 / Surface Warfare (SUW) Mission Package														
Proj 2552	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028							
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
SUW Mission Package					SSMM Shock				SSMM Hatch Mod Design																							

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules	Project (Number/Name) 2552 / Surface Warfare (SUW) Mission Package

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2552				
SUW Mission Package: SSMM Shock Qualification Testing	1	2023	4	2023
SUW Mission Package: SSMM Hatch Modification Development & Design	1	2024	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules				Project (Number/Name) 3129 / LCS Mission Package Development			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3129: LCS Mission Package Development	652.586	8.581	8.744	13.642	-	13.642	13.833	14.696	31.428	34.081	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 443												
A. Mission Description and Budget Item Justification												
The LCS Mission Modules Common Equipment consists of enabling products required by all Mission Packages to provide common hardware interfaces, computer operating environment, communications systems, aviation interface systems, and portable development & integration test-sets. Common hardware interfaces include definition, installation, and control of mechanical, electrical, and cooling requirements common to all mission packages. The Mission Package Computing Environment (MPCE) provides common services and Operating Environment to support all Mission Package Application Software (MPAS) and Open Architecture Products. The Multi-Vehicle Communications System (MVCS) enables the control and data exchange of simultaneous unmanned mission vehicles and the ship. Aviation interface systems include integration and management of data communications, data processing, and physical hardware interfaces such as common equipment and containers used by all mission packages. Development and integration test-sets provide a mobile operating environment installed in the Mission Package Portable Control Stations (MPPCSs) to serve as a surrogate ship during mission package development and integration test events at test ranges.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Command, Control, Communication, Computers, Cyber and Intelligence (C5I) and Mission Package Tactical Team Trainers								8.581	8.744	13.642	0.000	13.642
								-	-	-	-	-
Articles:												
FY 2023 Plans: Mission Package Computing Environment (MPCE) - AN/SYK-31 In support of Technology Refresh of MPCE and certification of version 2.0: - Continue integration and testing of MPCE v2.0 with the MCM Mission Package Application Software (MPAS) - Complete development and deliver MPCE version 2.0 Technical Data Package (TDP) - Conduct Mission Package testing with MPCE 2.0 - Conduct Production Readiness Review (PRR) and transition MPCE version 2.0 to production												
Multi-Vehicle Communications System (MVCS) - AN/SYC-1: - Develop requirements for MVCS 1.X (Tech Refresh) - Complete MCM USV and LCS integration testing and certification of MVCS 1.2.1												
LCS Common Mission Package Portable Control Station (MPPCS)/Common Mission Package Trainer (CMPT)												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules		Project (Number/Name) 3129 / LCS Mission Package Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div>- Continue the MPCE version 2.0 into MPPCS and CMPT</div> <div>FY 2024 Base Plans: Mission Package Computing Environment (MPCE) - AN/SYK-31 In support of Technology Refresh of MPCE and certification of version 2.X: - Complete integration and testing of MPCE v2.X with the MCM Mission Package Application Software (MPAS) - Conduct and complete integration testing of MPCE v2.X with LCS Lethality and Survivability Combat System - Conduct integration and testing of MPCE v2.X with the SUW Mission Package Application Software (MPAS) - Deliver first MPCE 2.X unit in support of LCS Lethality and Survivability upgrades - Begin development of next version of MPCE to address post MCM IOC requirements, new SUW MP requirements, cybersecurity improvements, and general hardware obsolescence/necessary technology refresh Multi-Vehicle Communications System (MVCS) - AN/SYC-1: - Support the implementation of Unmanned Vehicle transition to the Common Control Software (Beyond Line of Sight) - Begin development of MVCS 2.X (Tech Refresh) - Conduct MVCS 2.X PDR - Investigate/select replacement antenna for MVCS to support alternate operating frequencies - Continue development of software/security improvements to meet latest cybersecurity requirements - LCS Common Mission Package Portable Control Station (MPPCS)/Common Mission Package Trainer (CMPT) - Develop and integrate latest versions of SUW and MCM CMPT systems - Develop improvements to MPPCS to ensure system meets MCM Vessel of Opportunity requirements and supports follow-on SUW capabilities</div> <div>FY 2024 OCO Plans: N/A</div> <div>FY 2023 to FY 2024 Increase/Decrease Statement: The increase in FY2024 support initiating development of the next version of MPCE</div>						
Accomplishments/Planned Programs Subtotals		8.581	8.744	13.642	0.000	13.642

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy								Date: March 2023			
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603596N / <i>LCS Mission Modules</i>				Project (Number/Name) 3129 / <i>LCS Mission Package Development</i>			

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPN 1600: <i>LCS Common Mission Modules Equipment</i>	63.501	54.883	49.060	-	49.060	44.214	37.226	32.276	32.991	360.231	1,258.966
• OPN 1601: <i>LCS MCM Mission Modules</i>	30.119	92.495	93.961	-	93.961	122.654	103.972	59.906	61.344	1,508.277	2,664.640
• OPN 1602: <i>LCS ASW Mission Modules.</i>	1.565	3.594	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	68.135
• OPN 1603: <i>LCS SUW Mission Modules</i>	3.395	5.100	12.102	-	12.102	11.101	3.500	0.100	0.146	90.088	327.515
• WPN 4221: <i>LCS Module Weapons</i>	2.121	4.580	3.264	-	3.264	2.463	2.266	2.258	2.322	63.142	122.403

Remarks

D. Acquisition Strategy

The LCS Mission Module Acquisition Strategy is employing an incremental procurement approach to allow for the rapid introduction of additional capabilities as system technology matures. This phased plan provides incremental fielding of capability through the introduction of mature programs of record into the respective Mission Packages until the full baseline capability defined in the Capability Development Document (CDD) is reached.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules				Project (Number/Name) 3129 / LCS Mission Package Development					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
6.1 System Engineering	WR	NSWC PCD : Panama City, FL	0.275	0.000		0.000		0.000		-		0.000	0.000	0.275	-
6.1 System Engineering	WR	NSWC DD : Dahlgren, VA	1.784	0.000		0.000		0.000		-		0.000	0.000	1.784	-
6.1 System Engineering	WR	NAVSEALOGCEN : Norfolk, VA	1.520	0.000		0.000		0.000		-		0.000	0.000	1.520	-
6.1 System Engineering	C/CPFF	Northrop Grumman : Bethpage, NY	14.542	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
6.1 System Engineering	WR	NSWC Carderock : Bethesda, MD	2.610	0.000		0.000		0.000		-		0.000	0.000	2.610	-
6.1 System Engineering	WR	NSWC PHD : Port Hueneme, CA	1.568	0.000		0.000		0.000		-		0.000	0.000	1.568	-
6.1 System Engineering	WR	NIWC : San Diego, CA	7.660	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
6.1 System Engineering	C/CPIF	Booz Allen Hamilton : Washington, DC	0.355	0.000		0.000		0.000		-		0.000	0.000	0.355	-
6.4 Integration, Assembly, Test and Checkout	Sub Allot	CECOM Bldg 1207 : Various	1.092	0.000		0.000		0.000		-		0.000	0.000	1.092	-
6.4 Integration, Assembly, Test and Checkout	WR	NAWC AD : Patuxent River, MD	1.930	0.000		0.000		0.000		-		0.000	0.000	1.930	-
6.4 Integration, Assembly, Test and Checkout	WR	NSWC DD : Dahlgren, VA	0.203	0.000		0.000		0.000		-		0.000	0.000	0.203	-
6.4 Integration, Assembly, Test and Checkout	WR	NSWC PC : Panama City, FL	0.075	0.000		0.000		0.000		-		0.000	0.000	0.075	-
6.4 Integration, Assembly, Test and Checkout	C/CPFF	Northrop Grumman : Bethpage, NY	1.498	0.000		0.000		0.000		-		0.000	0.000	1.498	-
6.4 Integration, Assembly, Test and Checkout	WR	NSWC Carderock : Bethesda, MD	8.625	0.000		0.000		0.000		-		0.000	0.000	8.625	-
6.4 Integration, Assembly, Test and Checkout	C/CPFF	PMS 501 : Various	1.075	0.000		0.000		0.000		-		0.000	0.000	1.075	-
6.4 Integration, Assembly, Test and Checkout	WR	NIWC : San Diego, CA	1.857	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules				Project (Number/Name) 3129 / LCS Mission Package Development					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
6.4 Integration, Assembly, Test and Checkout	WR	NSWC PHD : Port Hueneme, CA	1.312	0.000		0.000		0.000		-		0.000	0.000	1.312	-
6.4 Integration, Assembly, Test and Checkout	C/CPIF	Booz Allen Hamilton : Washington, DC	0.950	0.000		0.000		0.000		-		0.000	0.000	0.950	-
6.4 Integration, Assembly, Test and Checkout	WR	NAVAIR : Lakehurst, NJ	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	-
4.0 Command, Control, Communication, Computers, Collaboration and Intelligence (C5I)	C/CPFF	AAC : Uniontown, PA	23.114	2.647	Dec 2021	2.647	Dec 2022	4.794	Dec 2023	-		4.794	0.000	33.202	-
4.0 Command, Control, Communication, Computers, Collaboration and Intelligence (C5I)	WR	NAWC TSD : Orlando, FL	2.304	0.000		0.552	Jan 2023	2.195	Jan 2024	-		2.195	0.000	5.051	-
4.0 Command, Control, Communication, Computers, Collaboration and Intelligence (C5I)	C/CPFF	Northrop Grumman : Bethpage, NY	5.282	0.030	Nov 2021	0.030	Nov 2022	0.050	Nov 2023	-		0.050	Continuing	Continuing	Continuing
4.0 Command, Control, Communication, Computers, Collaboration and Intelligence (C5I)	WR	NSWC PC : Panama City, FL	18.696	4.188	Nov 2021	4.296	Nov 2022	4.382	Nov 2023	-		4.382	Continuing	Continuing	Continuing
4.0 Command, Control, Communication, Computers, Collaboration and Intelligence (C5I)	WR	NUWC NPT : Newport, RI	3.279	0.260	Dec 2021	0.260	Dec 2022	0.275	Dec 2023	-		0.275	Continuing	Continuing	Continuing
4.0 Command, Control, Communication, Computers, Collaboration and Intelligence (C5I)	C/CPIF	Booz Allen Hamilton : Washington, DC	3.927	0.000		0.000		0.000		-		0.000	0.000	3.927	-
4.0 Command, Control, Communication, Computers, Collaboration and Intelligence (C5I)	WR	NIWC PAC : San Diego, CA	6.651	0.600	Jan 2022	0.200	Jan 2023	0.612	Jan 2024	-		0.612	0.000	8.063	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules				Project (Number/Name) 3129 / LCS Mission Package Development					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
4.0 Command, Control, Communication, Computers, Collaboration and Intelligence (C5I)	WR	NSWC DD : Dahlgren, VA	4.837	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
4.0 Command, Control, Communication, Computers, Collaboration and Intelligence (C5I)	WR	PMW 760 : Various	0.889	0.000		0.000		0.000		-		0.000	0.000	0.889	-
4.0 Command, Control, Communication, Computers, Collaboration and Intelligence (C5I)	C/CPFF	Progeny : Manassas, VA	1.730	0.000		0.000		0.000		-		0.000	0.000	1.730	-
1.0 MCM MP	WR	NSWC PC : Panama City, FL	71.297	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
1.0 MCM MP	Sub Allot	PMS 406 : Various	42.761	0.000		0.000		0.000		-		0.000	0.000	42.761	-
1.0 MCM MP	Sub Allot	PMS 495 : Various	0.249	0.000		0.000		0.000		-		0.000	0.000	0.249	-
1.0 MCM MP	WR	NSWC PHD : Port Hueneme, CA	2.300	0.000		0.000		0.000		-		0.000	0.000	2.300	-
1.0 MCM MP	C/CPIF	Booz Allen Hamilton : Washington, DC	0.400	0.000		0.000		0.000		-		0.000	0.000	0.400	-
1.0 MCM MP	C/CPFF	Northrop Grumman : Bethpage, NY	1.892	0.000		0.000		0.000		-		0.000	0.000	1.892	-
1.0 MCM MP	WR	Various : Various	1.124	0.000		0.000		0.000		-		0.000	0.000	1.124	-
2.0 ASW MP	Sub Allot	PEO IWS5E : Various	41.094	0.000		0.000		0.000		-		0.000	0.000	41.094	-
2.0 ASW MP	WR	NUWC NPT : Newport, RI	29.320	0.000		0.000		0.000		-		0.000	0.000	29.320	-
2.0 ASW MP	WR	SSC PAC : San Diego, CA	4.967	0.000		0.000		0.000		-		0.000	0.000	4.967	-
2.0 ASW MP	WR	CDSA Dam Neck : Virginia Beach, VA	11.145	0.000		0.000		0.000		-		0.000	0.000	11.145	-
2.0 ASW MP	C/CPFF	Northrop Grumman : Bethpage, NY	10.914	0.000		0.000		0.000		-		0.000	0.000	10.914	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules				Project (Number/Name) 3129 / LCS Mission Package Development					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
2.0 ASW MP	WR	PEO IWS 5A : Various	9.301	0.000		0.000		0.000		-		0.000	0.000	9.301	-
2.0 ASW MP	C/CPFF	SPA : Washington, DC	1.687	0.000		0.000		0.000		-		0.000	0.000	1.687	-
2.0 ASW MP	WR	NSWC DD : Dahlgren, VA	0.871	0.000		0.000		0.000		-		0.000	0.000	0.871	-
2.0 ASW MP	WR	NUWC KPT : Keyport, WA	1.095	0.000		0.000		0.000		-		0.000	0.000	1.095	-
2.0 ASW MP	WR	NSWC PHD : Port Hueneme, CA	1.550	0.000		0.000		0.000		-		0.000	0.000	1.550	-
2.0 ASW MP	C/FPIF	Booz Allen Hamilton : Washington, DC	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	-
2.0 ASW MP	WR	NAWC WD : Point Mugu, CA	5.430	0.000		0.000		0.000		-		0.000	0.000	5.430	-
2.0 ASW MP	C/CPFF	Various : Various	3.757	0.000		0.000		0.000		-		0.000	0.000	3.757	-
2.0 ASW MP	Sub Allot	Raytheon : Portsmouth, RI	42.056	0.000		0.000		0.000		-		0.000	0.000	42.056	-
3.0 SUW MP	C/CPFF	JAMS PO : Various	7.980	0.000		0.000		0.000		-		0.000	0.000	7.980	-
3.0 SUW MP	WR	NAWC WD : Ridgecrest, CA	7.826	0.000		0.000		0.000		-		0.000	0.000	7.826	-
3.0 SUW MP	C/CPFF	Northrop Grumman : Bethpage, NY	60.524	0.000		0.000		0.000		-		0.000	0.000	60.524	-
3.0 SUW MP	WR	NSWC CD : Crane, IN	0.396	0.000		0.000		0.000		-		0.000	0.000	0.396	-
3.0 SUW MP	WR	NSWC Corona : Corona, CA	1.695	0.000		0.000		0.000		-		0.000	0.000	1.695	-
3.0 SUW MP	WR	NSWC DD : Dahlgren, VA	60.316	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
3.0 SUW MP	WR	NSWC PHD : Port Hueneme, CA	30.437	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
3.0 SUW MP	Sub Allot	PEO IWS 3 : Various	9.819	0.000		0.000		0.000		-		0.000	0.000	9.819	-
Subtotal			582.543	7.725		7.985		12.308		-		12.308	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules				Project (Number/Name) 3129 / LCS Mission Package Development					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
6.5 Training Systems Development	WR	NAWC TSD : Orlando, FI	0.909	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
6.5 Training Systems Development	WR	NSWC PHD : Port Hueneme, CA	0.390	0.000		0.000		0.000		-		0.000	0.000	0.390	-
6.5 Training Systems Development	C/CPIF	Booz Allen Hamilton : Washington, DC	0.268	0.000		0.000		0.000		-		0.000	0.000	0.268	-
6.5 Training Systems Development	C/CPAF	Northrop Grumman : Bethpage, NY	0.575	0.000		0.000		0.000		-		0.000	0.000	0.575	-
6.5 Training Systems Development	Sub Allot	Various : Various	3.221	0.000		0.000		0.000		-		0.000	0.000	3.221	-
6.5 Training Systems Development	WR	JHU/APL : Laurel, MD	1.479	0.000		0.000		0.000		-		0.000	0.000	1.479	-
Subtotal			6.842	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC PHD : Port Hueneme, CA	27.963	0.000		0.000		0.000		-		0.000	0.000	27.963	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	COMOPTEVFOR : Norfolk, VA	4.944	0.000		0.000		0.000		-		0.000	0.000	4.944	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC Corona : Corona, CA	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NIWC : San Diego, CA	5.258	0.000		0.000		0.000		-		0.000	0.000	5.258	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	C/CPIF	Booz Allen Hamilton : Washington, DC	0.750	0.000		0.000		0.000		-		0.000	0.000	0.750	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603596N / LCS Mission Modules				Project (Number/Name) 3129 / LCS Mission Package Development					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			39.415	0.000		0.000		0.000		-		0.000	0.000	39.415	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
6.2 Program Management	C/CPFF	CACI : Fairfax, VA	7.698	0.000		0.000		0.000		-		0.000	0.000	7.698	-
6.2 Program Management	C/CPIF	Booz Allen Hamilton : Washington DC	5.505	0.856	Dec 2021	0.759	Dec 2022	0.755	Dec 2023	-		0.755	0.000	7.875	-
6.2 Program Management	FFRDC	Mitre : McLean, VA	2.679	0.000		0.000		0.000		-		0.000	0.000	2.679	-
6.2 Program Management	FFRDC	JHU/APL : Laurel, MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
6.2 Program Management	C/CPFF	Northrop Grumman : Bethpage, NY	4.977	0.000		0.000		0.579	Nov 2023	-		0.579	0.000	5.556	-
6.2 Program Management	C/CPFF	NSWC Crane : Various	2.927	0.000		0.000		0.000		-		0.000	0.000	2.927	-
Subtotal			23.786	0.856		0.759		1.334		-		1.334	0.000	26.735	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			652.586	8.581		8.744		13.642		-		13.642	Continuing	Continuing	N/A
Remarks															
Beginning in FY 2019, Mission Package funding is realigned into four (4) projects:															
2550 Mine Countermeasures (MCM) Mission Package															
2551 Anti-Submarine Warfare (ASW) Mission Package															
2552 Surface Warfare (SUW) Mission Package															
3129 LCS Mission Package Development															
Prior to FY 2019 all Mission Package funding was in Project 3129.															

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PE 0603596N: *LCS Mission Modules*
Navy

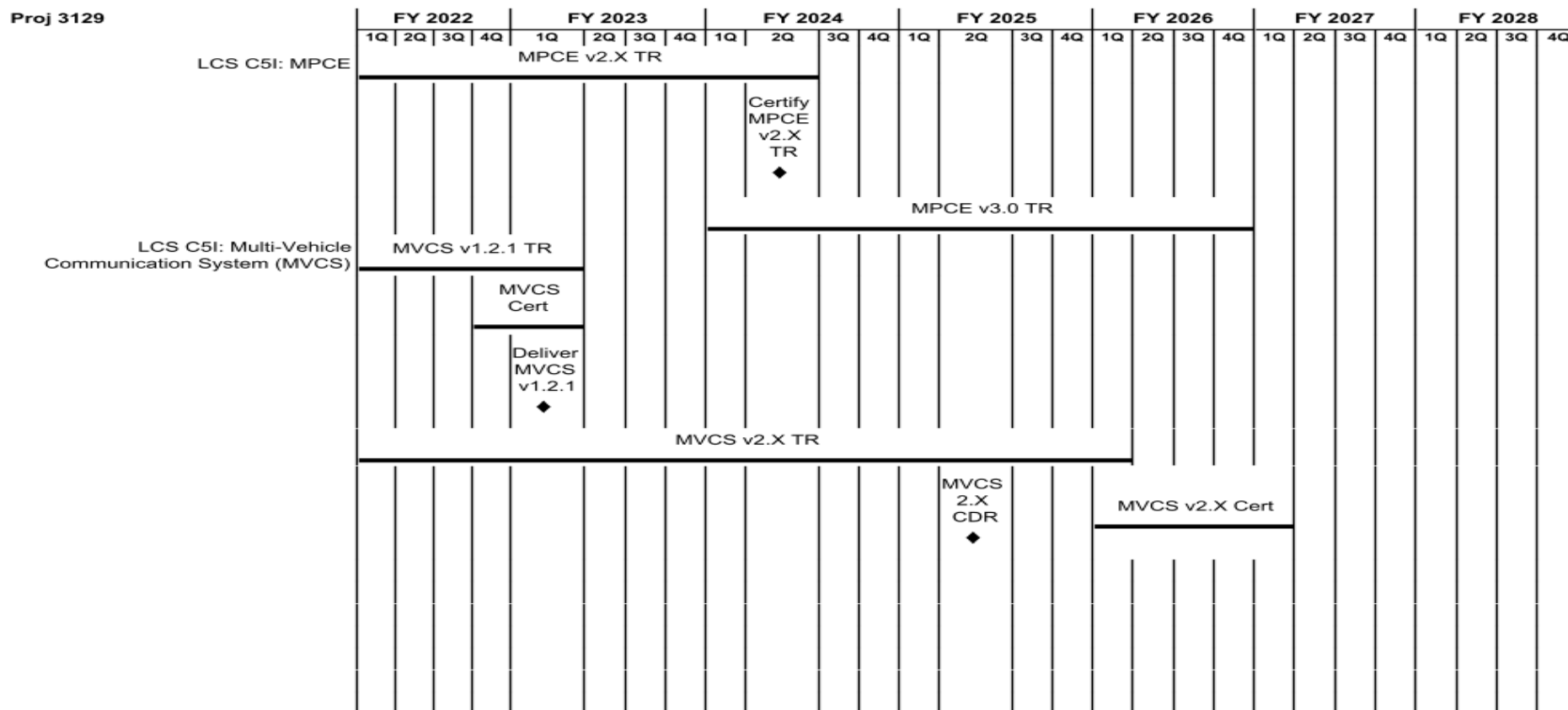
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PE 0603596N / LCS Mission Modules

3129 / LCS Mission Package Development

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603596N / <i>LCS Mission Modules</i>	Project (Number/Name) 3129 / <i>LCS Mission Package Development</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 3129</i>				
LCS C5I: MPCE: MPCE v2.X Tech Refresh Development	1	2022	2	2024
LCS C5I: MPCE: Certify MPCE v2.X	2	2024	2	2024
LCS C5I: MPCE: MPCE v3.0 Tech Refresh Development	1	2024	4	2026
LCS C5I: Multi-Vehicle Communication System (MVCS): MVCS v1.2.1 Tech Refresh Development	1	2022	1	2023
LCS C5I: Multi-Vehicle Communication System (MVCS): MVCS: Certify MVCS v1.2.1	4	2022	1	2023
LCS C5I: Multi-Vehicle Communication System (MVCS): Deliver MVCS v1.2.1	1	2023	1	2023
LCS C5I: Multi-Vehicle Communication System (MVCS): MVCS v2.X Tech Refresh Development	1	2022	1	2026
LCS C5I: Multi-Vehicle Communication System (MVCS): MVCS: CDR for MVCS v2.X	2	2025	2	2025
LCS C5I: Multi-Vehicle Communication System (MVCS): MVCS: Certify MVCS v2.X	1	2026	1	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603597N I (U)AUTOMATED TEST AND RE-TEST (ATRT)							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	166.719	36.461	60.073	10.809	-	10.809	11.008	11.255	11.496	11.732	98.280	417.833
9999: Congressional Adds	108.096	28.957	50.300	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	187.353
9B88: Automated Test and Analysis	58.623	7.504	9.773	10.809	-	10.809	11.008	11.255	11.496	11.732	98.280	230.480

A. Mission Description and Budget Item Justification

Starting in FY16, the Navy implemented an enterprise approach to Automated Test and Analysis (ATA) which adds a new method of automated test technologies, standardizes automated test practices, methods and tools. ATA expands the automated test methods that's currently used in Automated Test and Re-Test (ATRT). ATRT technologies provide essential development, assessment, and operational analysis capabilities to streamline testing and certification for both single systems and systems of systems capabilities in order to reduce development time for new capabilities from years to weeks. Also, leveraged to support refactoring, development, and assessment of Artificial Intelligence / Machine Learning (AI/ML) aids with other applications to deliver warfighting capability. Integration of legacy code and systems across the Naval warfighting portfolio soon to achieve an open integration and interoperability environment.

Project funding supports the development of enterprise level strategies and activities to apply ATA technologies to software-intensive acquisition programs. The objectives include support for the Chief of Naval Operations' (CNO) vision outlined in the CNO's Navigation Plan (NAVPLAN) through continued development and commercialization of ATRT Small Business Innovation Research (SBIR) technologies across the Navy enterprise. These SBIR derived technologies enable the Navy enterprise to make rapid capability improvements through software updates while maintaining a continuous Authority to Operate (ATO) on a common digital warfighting platform, and in enterprise sandbox technologies.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	37.805	9.773	10.495	-	10.495
Current President's Budget	36.461	60.073	10.809	-	10.809
Total Adjustments	-1.344	50.300	0.314	-	0.314
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	50.300			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.344	0.000			
• Program Adjustments	0.000	0.000	-0.145	-	-0.145
• Rate/Misc Adjustments	0.000	0.000	0.459	-	0.459

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023	
Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 0603597N I (U)AUTOMATED TEST AND RE-TEST (ATRT)	
Congressional Add Details (\$ in Millions, and Includes General Reductions)		FY 2022	FY 2023
Project: 9999: <i>Congressional Adds</i>			
Congressional Add: <i>Program Increase</i>		28.957	0.000
Congressional Add: <i>ATRT including Project Overmatch Integration</i>		0.000	50.300
Congressional Add Subtotals for Project: 9999		28.957	50.300
Congressional Add Totals for all Projects		28.957	50.300
Change Summary Explanation FINANCIAL: The increase to 9B88 of \$1.036M in program resources from FY 2023 to FY 2024 is required to further enable faster software testing in lab environments to facilitate delivery of better integrated software solutions into the fleet. This includes integration of test capabilities into laboratories as well as the Overmatch Software Armory (OSA). Additionally, program will provide support for future capabilities by leveraging Live, Virtual, and Constructive (LVC) events and utilizing live assets in an operational environment. TECHNICAL: No significant changes. SCHEDULE: Activities and milestones clarified to better show synchronization of Project 9B88 activities and deliverables in support of Project Overmatch and digital warfighting transformation objectives and enterprise sandbox technologies. Major Milestones - Project 9B88: The overall schedule for project 9B88 is held at a higher classification. In FY24, program anticipates Increment 2 IOC as well as the completion of a significant LVC event in Q1 2024 while building to quarterly LVC events throughout FY24.			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603597N / (U)AUTOMATED TEST AND RE-TEST (ATRT)				Project (Number/Name) 9999 / Congressional Adds			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: Congressional Adds	108.096	28.957	50.300	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	187.353
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
ATRT technologies provide essential development and operational analysis capabilities to streamline testing and certification for software for both single systems/units and systems of systems capabilities to reduce development time for new capabilities from years to weeks. Leveraging cloud and virtualization technologies within a force-level system of systems interoperability test bed, ATRT enables agile software updates to afloat and airborne edge infrastructures with automated near real-time analysis of interoperability improvements and performance virtually.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2022	FY 2023			
Congressional Add: Program Increase								28.957	0.000			
FY 2022 Accomplishments: - Continued to develop and utilize ATRT scaling to connect, bring visibility, learn and accelerate capability Deliveries. - Continued to scale the ATRT enterprise capabilities that support Cloud Development Environments (DevSecOps software factories, environments, and tools) - Continued the enhancement of ATRT tools supporting DevSecOps CD/CI in support of priority all domain mission thread(s). - Continued the scaling and expansion of ATRT to support cross-domain mission area test and analysis. - Continued to develop ATRT technologies to support Battle Management Aids (BMAs) and Tactical Decision Aids (TDA), including Artificial Intelligence (AI) /Machine Learning (ML) tools, leveraging scaling on the Navy's data pipeline for AI/ML.												
FY 2023 Plans: N/A												
Congressional Add: ATRT including Project Overmatch Integration								0.000	50.300			
FY 2022 Accomplishments: N/A												
FY 2023 Plans: - Continue to develop and utilize ATRT scaling to connect, bring visibility, learn and accelerate capability												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023	
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603597N / (U)AUTOMATED TEST AND RE-TEST (ATRT)				Project (Number/Name) 9999 / Congressional Adds			

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023
Deliveries. - Continue to scale the ATRT enterprise capabilities that support Cloud Development Environments (DevSecOps software factories, environments, and tools) - Continue the enhancement of ATRT tools supporting DevSecOps CD/CI in support of priority all domain mission thread(s). - Continue the scaling and expansion of ATRT to support cross-domain mission area test and analysis. - Continue to develop ATRT technologies to support Battle Management Aids (BMAs) and Tactical Decision Aids (TDA), including Artificial Intelligence (AI) /Machine Learning (ML) tools, leveraging scaling on the Navy's data pipeline for AI/ML.		
Congressional Adds Subtotals	28.957	50.300

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTEN/0604027N: <i>Digital Warfare</i>	44.969	165.753	181.001	-	181.001	139.103	136.748	137.440	140.221	Continuing	Continuing
Remarks											
This effort synergizes with and leverages / supports other funded efforts including Digital Warfare (RDTEN/PE 0604027N)) to support Project Overmatch and warfighting digital transformation efforts.											
D. Acquisition Strategy											
This is a non ACAT program. The ATA project enables automated test tool projects from all qualified sources that enable significantly reduced time to complete critical testing, increase productivity, system robustness, improving and speeding test analysis, and identify commonalities for reuse in transformational automated testing for Naval acquisition programs. This project leverages small business entrepreneurialship and innovation, and subsequent scaling of those capabilities to the Navy enterprise in partnership with the Defense Industrial Base, government laboratories / capabilities, and academia. Automated Test/Re-Test (ATRT) technologies enable significant reductions in the time to complete critical testing, and produce objective quality evidence in support of validation, verification and certification of engineering artifacts, and will provide a test apparatus within Naval Development, Security, and Operations (DevSecOps) software factories that ensure applications support development of warfighting capabilities that meet test driven development and standards before deployment leveraging Continuous Integration / Continuous Development software pipelines and scaling. These efforts leveraging ATRT technologies, and ATRT-powered analytics on the edge will enable priority mission threads and Warfare models in order to deliver capability across force level kill chains.											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603597N / (U)AUTOMATED TEST AN D RE-TEST (ATRT)				Project (Number/Name) 9999 / Congressional Adds					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Automated Test & Analysis	C/CPFF	Innovative Defense Technologies (IDT) : Ballston, VA	59.334	23.086	May 2022	42.140	May 2023	0.000		-		0.000	0.000	124.560	-
Automated Test & Analysis	WR	NIWC Pacific : San Diego, CA	4.563	1.054	May 2022	1.924	May 2023	0.000		-		0.000	0.000	7.541	-
Automated Test & Analysis	Various	Various NSWCs : Various	7.692	2.395	May 2022	4.371	May 2023	0.000		-		0.000	0.000	14.458	-
Automated Test & Analysis	C/FFP	NUWC Newport : Newport, RI	1.058	0.297	May 2022	0.542	May 2023	0.000		-		0.000	0.000	1.897	-
Automated Test & Analysis	C/BA	NAWC AD : Patuxent River, MD	1.563	0.725	May 2022	1.323	May 2023	0.000		-		0.000	0.000	3.611	-
Automated Test & Analysis (Prior Year)	Various	Various Activity : Not Specified	28.100	0.000		0.000		0.000		-		0.000	0.000	28.100	-
Subtotal			102.310	27.557		50.300		0.000		-		0.000	0.000	180.167	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Automated Test & Analysis	C/CPFF	DELTA Resources, Inc. : Washington, DC	5.269	1.400	May 2022	0.000		0.000		-		0.000	0.000	6.669	-
Automated Test & Analysis (Prior Year)	Various	Various Activity : Not Specified	0.517	0.000		0.000		0.000		-		0.000	0.000	0.517	-
Subtotal			5.786	1.400		0.000		0.000		-		0.000	0.000	7.186	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			108.096	28.957		50.300		0.000		-		0.000	0.000	187.353	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																Date: March 2023			
Appropriation/Budget Activity 1319 / 4								R-1 Program Element (Number/Name) PE 0603597N / (U)AUTOMATED TEST AND RE-TEST (ATRT)								Project (Number/Name) 9999 / Congressional Adds			

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 9999																												
Automated Test and Analysis (ATA): Automated Test and Analysis: ATRT Development & Scaling																												
Automated Test and Analysis (ATA): Automated Test and Analysis: ATRT Support for BMA / TDA Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603597N / (U)AUTOMATED TEST AND RE-TEST (ATRT)	Project (Number/Name) 9999 / Congressional Adds	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
Automated Test and Analysis (ATA): Automated Test and Analysis: ATRT Development & Scaling	1	2022	1	2027
Automated Test and Analysis (ATA): Automated Test and Analysis: ATRT Support for BMA / TDA Development	1	2022	1	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603597N / (U)AUTOMATED TEST AND RE-TEST (ATRT)				Project (Number/Name) 9B88 / Automated Test and Analysis			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9B88: Automated Test and Analysis	58.623	7.504	9.773	10.809	-	10.809	11.008	11.255	11.496	11.732	98.280	230.480
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Program objectives are to provide Automated Test and Re-Test (ATRT) capabilities to enable faster and more consistent testing across the Naval enterprise. Specifically in the near term this project seeks to implement ATRT into digital capabilities, laboratory testing, and the Overmatch Software Armory (OSA) DevSecOps environment to conduct secure system development scalable distributed simulation. A seamless push to afloat, airborne, and edge infrastructure allowing the Navy's designated user community to make software updates (new and modernization of old code) while maintaining, or eliminating, the need for an Authority to Operate (ATO). The Continuous Delivery/Continuous Integration (CD/CI) of capability enabled by the ATRT technology for real time software code analysis and performance testing in the Cloud Development Environment (CDE) as well as rapid feedback in the Operational Environment (OE). Enabling this effort, this program is developing and scaling the Integrated Modeling Environment (IME), which supports shared and linked Model Based Systems Engineering (MBSE) from the mission level to the function/system level. This will in turn power the ATRT models that analytically link together software code production output with intended planned capability developed against gaps filled at the mission level, enabling rapid and continuous iteration and deployment of software into the digital environment.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Automated Test and Analysis	7.504	9.773	10.809	0.000	10.809
Articles:	-	-	-	-	-
FY 2023 Plans: - Continue to develop and utilize ATRT scaling to connect, bring visibility, learn and accelerate capability deliveries. - Continue to scale the ATRT enterprise capabilities that support Cloud Development Environments (DevSecOps software factories, environments, and tools) - Continue the enhancement of ATRT tools supporting DevSecOps CD/CI in support of priority all domain mission thread(s). - Continue the scaling and expansion of ATRT to support cross-domain mission area test and analysis.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603597N I (U)AUTOMATED TEST AN D RE-TEST (ATRT)		Project (Number/Name) 9B88 I Automated Test and Analysis		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Continue to develop ATRT technologies to support Battle Management Aids (BMAs) and Tactical Decision Aids (TDA), including Artificial Intelligence/Machine Learning (AI/ML) tools, leveraging scaling on the Navy's data pipeline for AI/ML and digital environments, and inclusion of open cloud environments for third party applications.</p> <p>FY 2024 Base Plans:</p> <p>- Continue to scale the ATRT enterprise capabilities that support Cloud Development Environments (DevSecOps software factories, environments, and tools)</p> <p>- Continue the enhancement of ATRT tools supporting DevSecOps CD/CI in support of priority all domain mission thread(s).</p> <p>- Continue the scaling and expansion of ATRT to support cross-domain mission area test and analysis.</p> <p>- Continue to develop ATRT technologies to support Battle Management Aids (BMAs) and Tactical Decision Aids (TDA), including Artificial Intelligence/Machine Learning (AI/ML) tools, leveraging scaling on the Navy's data pipeline for AI/ML and digital environments, and inclusion of open cloud environments for third party applications.</p> <p>- Provide support to Information Warfare LVC training events such as NILE, PROJECT CONVERGENCE 2024, and FLEX events to develop fleet CONOPS/COMEMPS ISO OM capability deliverables post-MVP.</p> <p>- Commence support for future capabilities delivery by leveraging FLEX events such as TRIDENT WARRIOR 2024 or Large Scale Exercise to mature OM capabilities utilizing live assets in an operational environment.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The increase of \$1.036M in program resources from FY 2023 to FY 2024 is required to further enable faster software testing in lab environments to facilitate delivery of better integrated software solutions into the fleet. This includes integration of test capabilities into laboratories as well as the Overmatch Software Armory (OSA). Additionally, program will provide support for future capabilities by leveraging Live, Virtual, and Constructive events and utilizing live assets in an operational environment.</p>						
Accomplishments/Planned Programs Subtotals		7.504	9.773	10.809	0.000	10.809

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy									Date: March 2023			
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603597N / (U)AUTOMATED TEST AND RE-TEST (ATRT)				Project (Number/Name) 9B88 / Automated Test and Analysis				
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
• RDTEN/0604027N: <i>Digital Warfare</i>	44.969	165.753	181.001	-	181.001	139.103	136.748	137.440	140.221	Continuing	Continuing	
Remarks												
This effort synergizes with and leverages / supports other funded efforts including Digital Warfare (RDTEN/PE 0604027N) to support Project Overmatch and warfighting digital transformation efforts.												
D. Acquisition Strategy												
This is a non-ACAT program. Usage of SBIR Phase III contracts is a cornerstone of the Automated Test & Analysis, Project 9B88 acquisition strategy. The ATA program solicits automated test tool projects from all qualified sources that show the potential to significantly reduce the time to complete critical testing, increase productivity or system robustness, improving and speeding test analysis, and identify commonalities for reuse in testing of Naval acquisition programs. All valid submitted projects will be evaluated for potential funding. Projects selected will typically be funded for one year, in which time they must demonstrate their ability to significantly reduce the time to complete critical testing, improve and speed test analysis, or find and correct critical design flaws in testing of Naval acquisition programs. Successful funded projects and artifacts will be advertised and made available across the Naval enterprise for acquisition program consideration, funding, and use. These include engagements throughout the Defense Industrial Base, government laboratories, and academia, to develop and deliver Automated Test and Re-Test (ATRT) suite of technologies.												
This effort synergizes with and leverages / supports other funded efforts including Digital Warfare (PE 0604027N), Automated Combat Systems Tech (PE 0603382N), Modeling & Simulation Support (PE 0308601N), and Intelligence Mission Data (IMD) (PE 0307577N) to support Project Overmatch and warfighting digital transformation efforts, and enterprise sandbox technologies.												

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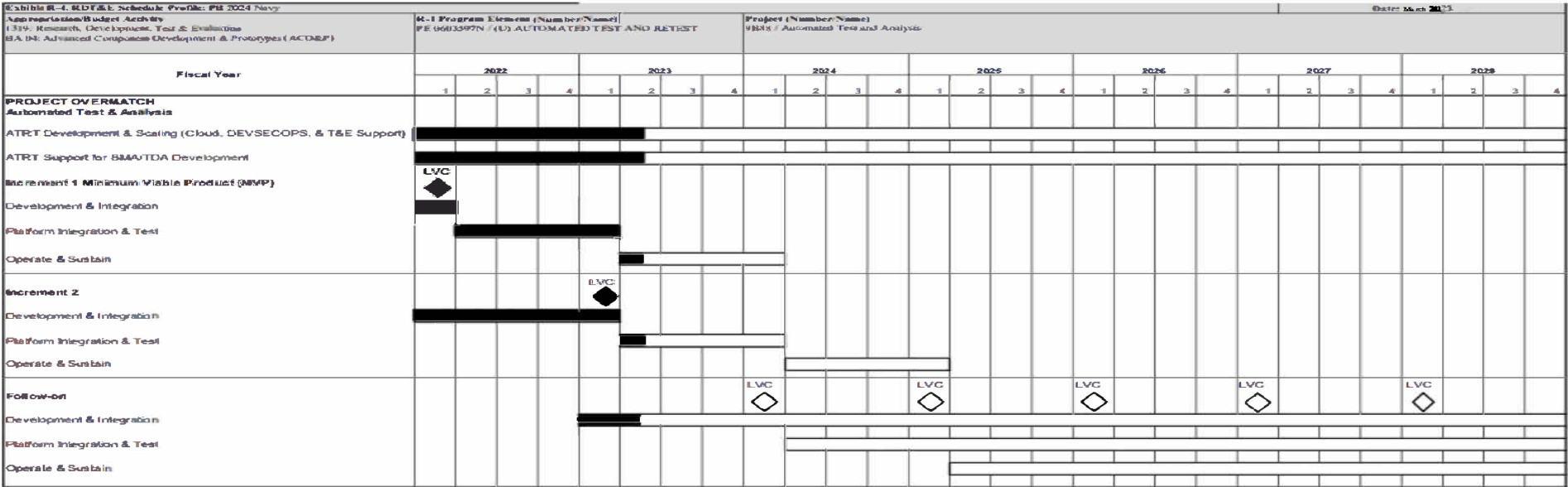
Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603597N / (U)AUTOMATED TEST AN D RE-TEST (ATRT)					Project (Number/Name) 9B88 / Automated Test and Analysis				
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Automated Test & Analysis	C/CPFF	Innovative Defense Technologies (IDT) : Ballston, VA	38.322	3.035	Dec 2021	3.348	Dec 2022	3.491	Dec 2023	-		3.491	0.000	48.196	Continuing
Automated Test & Analysis	WR	NIWC Pacific : San Diego, CA	12.174	2.419	Nov 2021	2.976	Nov 2022	3.125	Nov 2023	-		3.125	0.000	20.694	Continuing
Automated Test & Analysis	Various	Various NWCFS : Various NWCFS	4.129	0.750	Nov 2021	1.757	Nov 2022	2.354	Nov 2023	-		2.354	0.000	8.990	Continuing
Automated Test & Analysis	Various	Various Non- NWCFS : Various Non-NWCFS	2.260	1.050	Apr 2022	1.542	Nov 2022	1.619	Nov 2023	-		1.619	0.000	6.471	Continuing
Automated Test & Analysis (Prior Year)	Various	Various Activity : Not Specified	1.416	0.000		0.000		0.000		-		0.000	0.000	1.416	-
Subtotal			58.301	7.254		9.623		10.589		-		10.589	0.000	85.767	N/A
Remarks															
Funding increase of \$0.678M from FY23 to FY24 is due to the increased need to deliver integrated systems of systems software solutions to the fleet via faster test speeds from the ATRT effort.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Automated Test & Analysis	C/CPFF	Tech-Marine Business : Washington, DC	0.172	0.100	Nov 2021	0.000	Dec 2022	0.220	Dec 2023	-		0.220	0.000	0.492	Continuing
Subtotal			0.172	0.100		0.000		0.220		-		0.220	0.000	0.492	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603597N / (U)AUTOMATED TEST AND RE-TEST (ATRT)						Project (Number/Name) 9B88 / Automated Test and Analysis			
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Digital Transformation and Integration Support	Various	Various : Various	0.150	0.150	Nov 2021	0.150	Dec 2022	0.000		-		0.000	0.000	0.450	Continuing
Subtotal			0.150	0.150		0.150		0.000		-		0.000	0.000	0.450	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			58.623	7.504		9.773		10.809		-		10.809	0.000	86.709	N/A
Remarks															

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603597N / (U)AUTOMATED TEST AND RE-TEST (ATRT)	Project (Number/Name) 9B88 / Automated Test and Analysis

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603597N / (U)AUTOMATED TEST AND RE-TEST (ATRT)

Project (Number/Name)

9B88 / Automated Test and Analysis

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9B88				
Automated Test & Analysis: Automated Test and Analysis: ATRT Development & Scaling	1	2022	4	2028
Automated Test & Analysis: Automated Test and Analysis: ATRT Support for BMA / TDA Development	1	2022	4	2028
Increment 1 Minimum Viable Product: Development and Integration: Live, Virtual, and Constructive Test Event	1	2022	1	2022
Increment 1 Minimum Viable Product: Development & Integration	1	2022	1	2022
Increment 1 Minimum Viable Product: Platform Integration & Test	2	2022	1	2023
Increment 1 Minimum Viable Product: Operate & Sustain	2	2023	1	2024
Increment 2: Development and Integration: Live, Virtual, and Constructive Test Event	1	2023	1	2023
Increment 2: Development & Integration	1	2022	1	2023
Increment 2: Platform Integration & Test	2	2023	1	2024
Increment 2: Operate & Sustain	2	2024	1	2025
Increment 2: Follow-on: Development and Integration: Live, Virtual, and Constructive Test Event 24	1	2024	1	2024
Increment 2: Follow-on: Development and Integration: Live, Virtual, and Constructive Test Event 25	1	2025	1	2025
Increment 2: Follow-on: Development and Integration: Live, Virtual, and Constructive Test Event 26	1	2026	1	2026
Increment 2: Follow-on: Development and Integration: Live, Virtual, and Constructive Test Event 27	1	2027	1	2027
Increment 2: Follow-on: Development and Integration: Live, Virtual, and Constructive Test Event 28	1	2028	1	2028

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603597N / (U)AUTOMATED TEST AND RE-TEST (ATRT)	Project (Number/Name) 9B88 / Automated Test and Analysis	
	Start		End
Events by Sub Project	Quarter	Year	Quarter Year
Increment 2: Follow-on: Development & Integration	1	2023	4 2028
Increment 2: Follow-on: Platform Integration & Test	2	2024	4 2028
Increment 2: Follow-on: Operate & Sustain	2	2025	4 2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603599N / FRIGATE Development							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	496.359	98.022	108.626	112.972	-	112.972	112.914	108.174	108.393	106.884	Continuing	Continuing
3086: Frigate	496.359	98.022	108.626	112.972	-	112.972	112.914	108.174	108.393	106.884	Continuing	Continuing
Program MDAP/MAIS Code: Project MDAP/MAIS Code(s): P606												
A. Mission Description and Budget Item Justification												
The Constellation class frigate (FFG 62) is a more lethal and survivable multi-mission small surface combatant. With FFG 62, the Navy will maximize the small surface combatant capabilities in the Anti-Surface Warfare (SUW), Anti-Submarine Warfare (ASW), Electronic Warfare/Information Operations (EW/IO), Air Warfare (AW) mission areas, and survivability while keeping the ship an affordable component of the "high-low" mix of surface ships. The FFG(X) Capability Development Document (CDD) was approved by the Joint Requirement Oversight Council (JROC) in Feb 2019 and completed Milestone B, an informed Independent Cost Estimate, and award of the Detail Design & Construction (DD&C) contract in April 2020.												
FY 2024 funds will develop Variable Depth Sonar (VDS) capability via the Combined Active Passive Towed Array Sonar (CAPTAS) and continue Combat System development and Aegis Weapon System (AWS) integration, test and evaluation efforts including Live Fire Test & Evaluation (LFT&E) and Developmental Testing (DT) support as well as Cyber security implementation and Land Based Engineering Site construction.												
FY 2023 funds continue to mature Combat System and C4I elements into an integrated baseline to support ship construction; assess platform risk via Early Integration Testing events; continue development, coding, test, and assessment of the FFG AWS; test and evaluation activities relevant to ship survivability; and mature the FFG Land Based Engineering Site (LBES) test program.												
FY 2022 funds continue focus on AWS design development, coding, and test; Combat System and C4I Element Integration; and test and evaluation activities including Shock Qualification Testing, cyber table top (#3), and development of a LBES Test Program.												

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0603599N / FRIGATE Development			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	100.203	118.626	102.556	-	102.556
Current President's Budget	98.022	108.626	112.972	-	112.972
Total Adjustments	-2.181	-10.000	10.416	-	10.416
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-10.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.181	0.000			
• Program Adjustments	0.000	0.000	8.669	-	8.669
• Rate/Misc Adjustments	0.000	0.000	1.747	-	1.747
Change Summary Explanation					
FY24 budget increase of \$4.3M is the net result of \$11.1M increase for greater efforts to integrate Variable Depth Sonar (VDS) capability on Frigates and to conduct additional events in support of Live Fire Test and Evaluation, and \$1.6M increase for Land Based Test Site and various rate adjustments.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603599N / FRIGATE Development				Project (Number/Name) 3086 / Frigate			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3086: Frigate	496.359	98.022	108.626	112.972	-	112.972	112.914	108.174	108.393	106.884	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: P606												
A. Mission Description and Budget Item Justification												
<p>Frigate (FFG 62 Class) efforts are composed of the design and development for a more lethal and survivable multi-mission warship focused on Anti-Surface Warfare (SUW) and Anti-Submarine Warfare capabilities (ASW), local air defense and enhanced survivability features. FFG 62 Class design modifications for added capability over the Littoral Combat Ship (LCS) include an Over-the-Horizon (OTH) surface-to-surface missile system, upgraded air defense weapons and sensors, advanced electronic warfare system and improved decoys, local air defense, and enhanced survivability features. This effort will encompass design, development, and technical issue resolution to support design maturity for DD&C FY 2020 contract award. Certification and testing efforts are also required to support the FFG 62 Class delivery, operations, and introduction to the fleet.</p> <p>The FFG 62 Class design and development phases include platform design, development and risk reduction; combat system element integration; total ship system engineering and integration; combat systems and warfare systems certification; and planning and conduct of system testing. These efforts include procurement of combat and warfare system equipment and/or simulators to support production representative testing in support of design, development, and certification efforts and ordnance in support of testing.</p> <p>This funding will also include efforts and activities required for formal Developmental and Operational testing of the FFG 62 program. Test and Evaluation (T&E) will concentrate on verifying integration and interoperability of employed technologies and systems in the FFG 62 design to achieve the mission capabilities and performance requirements as defined in the FFG 62 Class Capability Development Document (CDD). Funding will also be for the execution of LFT&E DT, C4I integration & test, cyber test and certification, warfare system integration & test and certification, aviation (manned and unmanned) integration & test and certification. T&E functions will include the evaluation of Critical Technical Parameters (CTP), Measures of Effectiveness (MOE), Measures of Suitability (MOS), and Key Performance Parameters (KPP).</p>												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)							FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	
Title: Test & Evaluation							24.959	30.970	33.764	0.000	33.764	
							Articles: -	-	-	-	-	
Description: Conduct FFG(X) test planning in support of Developmental Testing (DT) and Operational Testing (OT). Plan for and begin testing in support of Live Fire Test and Evaluation (LFT&E) modeling and small-scale empirical testing to support initiation of efforts to model FFG(X) survivability. Plan for and begin aligning resources to conduct future Early Integration Tests and Cybersecurity Tests as risk reductions for ship construction industrial stage testing. Refine testing schedules and testing resource requirements timelines to support later integration and certification testing. Complete high-level plans such as Test and Evaluation Master Plan (TEMP) and LFT&E Management Plan, and begin review and refinement of more detailed test plans												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603599N / FRIGATE Development	Project (Number/Name) 3086 / Frigate			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
and procedures. Plan for and execute DT, C4I integration & test, cyber test and certification, warfare system integration & test and certification, aviation (manned and unmanned) integration & test and certification.						
FY 2023 Plans: FY 2023 Plans: Execute additional live-fire tests in support of generating empirical LFT&E survivability data to continue the verification, validation, and accreditation of multiple LFT&E survivability models. Conduct and concluded networked, multi-site land based Early Integration Testing events to include post-analysis and correction. Mature Test Procedures submitted for Government Furnished Equipment (GFE) to confirm suitability for shipyard stage testing. Align historical test results for use as FFG DT and OT data to reduce future at-sea testing requirements. Review and incorporate integrated Warfare System baseline test requirements to inform Combat System Test Bed (CSTB) development, verification, validation, and initial test runs. Utilize Early Operational Assessment (EOA) results for iterative assessment of the following: draft CONOPS, preliminary ship design documentation, planned mission critical systems hardware and software versions and how they are to be integrated into the ship design, and manning and training plans. Develop FFG LBES test indices and sequences to support future component, system, and plant light-offs. Provide integral engineering support of FFG LBES in parallel of ship construction findings and vendor guidance.						
OCO: FY 2023 OCO Plans: N/A						
FY 2024 Base Plans: FY 2024 Plans: Execute additional live-fire tests in support of generating empirical LFT&E survivability data to continue the verification, validation, and accreditation of multiple LFT&E survivability models. Conduct and complete networked, multi-site land based Early Integration Testing events to include post-analysis and correction. Mature Test Procedures submitted for Government Furnished Equipment (GFE) to confirm suitability for shipyard stage testing. Align historical test results for use as FFG DT and OT data to reduce future at-sea testing requirements. Review and incorporate integrated Warfare System baseline test requirements to inform Combat System Test Bed (CSTB) development, verification, validation, and initial test runs. Utilize Early Operational Assessment (EOA) results for iterative assessment of the following: draft CONOPS, preliminary ship design documentation, planned mission critical systems hardware and software versions and how they are to be integrated into the ship design, and manning and training plans. Develop FFG LBES test indices and sequences to support future						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603599N / FRIGATE Development		Project (Number/Name) 3086 / Frigate		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
component, system, and plant light-offs. Provide integral engineering support of FFG LBES in parallel of ship construction findings and vendor guidance. OCO: FY 2024 OCO Plans: N/A FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: \$2.8M increase is due to increased requirements for Test and Evaluation in support of DT&E and Live Fire Test and Evaluation.						
Title: Ship Systems / C4I / Warfare Systems Engineering Articles: Description: The Frigate (FFG 62 Class)is a multi-mission ship that focuses on Anti-Surface Warfare (SUW), Anti-Submarine Warfare (ASW) capabilities and local air defense. Specific capabilities include Over-the-Horizon (OTH), upgraded Air Defense weapons and sensors, advanced electronic warfare system and improved decoys, towed array, torpedo defense, and enhanced survivability features. FY 2023 Plans: FY 2023 Base Plans: C4I / Warfare Systems Engineering Continue system engineering and platform integration efforts for C4I, Combat, and Aviation systems. Continue AWS development efforts to ensure platform combat capability, including the integration of AN/SPY-6(V)3 radar and Rolling Airframe Missile (RAM) system into the Combat System. Continue development and integration efforts of SQQ-89 with Frigate ASW sensor suite, in addition to Combined Active Passive Towed Array Sonar (CAPTAS) development and integration efforts. Continue integration of AN/SPY-6(V)3 radar to meet Frigate requirements. The program will mature the integrated Warfare System baseline in support of integration and test activities through the CSTB, to determine platform performance against a wide variety of threats in each mission area. Implement additional cyber security/information assurance (IA) measures on the warfare system and C4I suite to pace the current and future threats. Continue product development and planning for warfare system, C4I, and HM&E. Continue to optimize combat system capabilities for the design of hull. Continue modeling and simulation via Frigate Readiness Assessment Model for sustainment and readiness CDD requirements.		73.063 -	77.656 -	79.208 -	0.000 -	79.208 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603599N / FRIGATE Development		Project (Number/Name) 3086 / Frigate		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
OCO: FY 2023 OCO Plans: N/A FY 2024 Base Plans: FY 2024 Base Plans: C4I / Warfare Systems Engineering Integrate the Variable Depth Sonar (VDS) capability onboard Frigates ships through the development and integration of the CAPTAS. Continue system engineering and platform integration efforts for C4I, Combat, and Aviation systems. Continue AWS development efforts to ensure platform combat capability, including the integration of AN/SPY-6(V)3 radar and Rolling Airframe Missile (RAM) system into the Combat System. Continue development and integration efforts of SQQ-89 with Frigate ASW sensor suite, in addition to DART development and integration efforts. Continue integration of AN/SPY-6(V)3 radar to meet Frigate requirements. The program will mature the integrated Warfare System baseline in support of integration and test activities through the CSTB, to determine platform performance against a wide variety of threats in each mission area. Implement additional cyber security/information assurance (IA) measures on the warfare system and C4I suite to pace the current and future threats. Continue product development and planning for warfare system, C4I, and HM&E. Continue to optimize combat system capabilities for the design of hull. Continue modeling and simulation via Frigate Readiness Assessment Model for sustainment and readiness CDD requirements. OCO: FY 2024 OCO Plans: N/A FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: \$1.6M increase is due to increased effort/tasking required for Combat System Development.						
Accomplishments/Planned Programs Subtotals		98.022	108.626	112.972	0.000	112.972

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy							Date: March 2023		
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603599N / FRIGATE Development			Project (Number/Name) 3086 / Frigate		

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024	FY 2024	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	Cost To	Total Cost
			Base	OCO	Total					Complete	
• SCN/2128: FFG-Frigate	1,090.900	1,135.224	2,173.698	-	2,173.698	1,037.042	1,932.900	1,041.357	2,057.744	8,612.597	21,421.762

Remarks

D. Acquisition Strategy

The FFG 62 Class revised acquisition strategy was signed in 2nd QTR FY 2023.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603599N / FRIGATE Development

Project (Number/Name)

3086 / Frigate

Product Development (\$ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Conceptual Design Contracts	C/FFP	Various : Various	108.747	0.000		0.000		0.000		-		0.000	0.000	108.747	-
System SPEC Development	WR	Government Activities : Various	8.455	0.000		0.000		0.000		-		0.000	0.000	8.455	-
System SPEC Development	C/CPAF	Various Contractors : Various	26.686	0.000		0.000		0.000		-		0.000	0.000	26.686	-
Over the Horizon (OTH) Missile Integration	WR	NAWC, China Lake : China Lake, CA	2.763	0.985	Feb 2022	1.816	Feb 2023	1.570	Feb 2024	-		1.570	Continuing	Continuing	Continuing
Over the Horizon (OTH) Missile Integration	WR	Various : Various	4.538	0.000		1.875	Feb 2023	1.621	Feb 2024	-		1.621	Continuing	Continuing	Continuing
FFG Architecture Framework/ Cyber	C/CPAF	Engility : San Diego, CA	4.192	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
C4I Development	WR	NIWC : Charleston, SC	10.217	3.015	Nov 2021	1.548	Nov 2022	1.339	Nov 2023	-		1.339	Continuing	Continuing	Continuing
C4I Development	WR	NIWC : San Diego, CA	10.673	4.223	Nov 2021	1.527	Nov 2022	1.321	Nov 2023	-		1.321	Continuing	Continuing	Continuing
AEGIS Weapons System Development (AWS)	C/CPIF	Lockheed Martin : Various	73.945	17.765	Jan 2022	9.891	Jan 2023	10.101	Jan 2024	-		10.101	Continuing	Continuing	Continuing
AEGIS Weapons System Development (AWS)	Various	Various Contractors : Various	9.803	6.931	Nov 2021	16.720	Nov 2022	13.990	Nov 2023	-		13.990	Continuing	Continuing	Continuing
AEGIS Weapons System Development (AWS)	WR	Government Activities : Various	14.137	5.640	Nov 2021	9.291	Nov 2022	8.033	Nov 2023	-		8.033	Continuing	Continuing	Continuing
Warfare Systems Development	WR	NUWC, Newport : Newport, RI	5.725	0.591	Nov 2021	0.595	Nov 2022	0.515	Nov 2023	-		0.515	Continuing	Continuing	Continuing
Warfare Systems Development	WR	NSWC, DD : Dahlgren, VA	12.291	3.662	Nov 2021	3.666	Nov 2022	3.170	Nov 2023	-		3.170	Continuing	Continuing	Continuing
Warfare Systems Development	WR	NSWC, CD : Carderock, MD	4.718	3.397	Nov 2021	3.646	Nov 2022	3.153	Nov 2023	-		3.153	Continuing	Continuing	Continuing
Warfare Systems Development	C/CPIF	Lockheed Martin : Various	20.675	7.792	Dec 2021	8.026	Dec 2022	6.939	Dec 2023	-		6.939	Continuing	Continuing	Continuing
Warfare Systems Development	Various	Various : Various	23.876	5.157	Nov 2021	5.814	Nov 2022	16.112	Nov 2023	-		16.112	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603599N / <i>FRIGATE Development</i>						Project (Number/Name) 3086 / <i>Frigate</i>			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Warfare Systems Development	WR	Government Activities : Various	11.826	4.141	Nov 2021	4.204	Nov 2022	3.635	Nov 2023	-		3.635	Continuing	Continuing	Continuing
Aviation Integration Development	WR	NAWC, AD : Patuxent River, MD	6.438	0.726	Dec 2021	0.312	Dec 2022	0.270	Dec 2023	-		0.270	Continuing	Continuing	Continuing
Aviation Integration Development	WR	NSWC, DD : Dahlgren, VA	2.129	0.300	Nov 2021	0.300	Nov 2022	0.260	Nov 2023	-		0.260	Continuing	Continuing	Continuing
Product Development Support	WR	Various : Various	4.703	1.914	Nov 2021	1.913	Nov 2022	1.654	Nov 2023	-		1.654	Continuing	Continuing	Continuing
Subtotal			366.537	66.239		71.144		73.683		-		73.683	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NSWC, CD : Carderock, MD	17.588	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC, PD : Philadelphia, PA	7.768	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC, DD : Dahlgren, VA	10.908	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC, PHD : Port Hueneme, CA	2.051	0.437	Nov 2021	0.558	Nov 2022	0.481	Nov 2023	-		0.481	Continuing	Continuing	Continuing
Government Engineering Support	WR	Government Activities : Various	5.221	0.578	Nov 2021	0.596	Nov 2022	0.516	Nov 2023	-		0.516	Continuing	Continuing	Continuing
Contractor Engineering Support	C/CPAF	Booz Allen Hamilton : McLean, VA	4.270	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Contractor Engineering Support	C/CPAF	Gryphon : Arlington, VA	1.950	0.000		0.000		0.000		-		0.000	0.000	1.950	-
Contractor Engineering Support	C/CPIF	Alion : Arlington, VA	11.029	2.465	Aug 2022	2.187	Aug 2023	1.544	Aug 2024	-		1.544	Continuing	Continuing	Continuing
Contractor Engineering Support	Various	Various : Various	6.612	1.130	Jan 2022	1.147	Jan 2023	0.992	Jan 2024	-		0.992	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603599N / FRIGATE Development				Project (Number/Name) 3086 / Frigate					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			67.397	4.610		4.488		3.533		-		3.533	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC, CD : Carderock, MD	11.539	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	Government Activities : Various	3.316	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	Government Activities : Various	6.554	5.223	Dec 2021	7.274	Dec 2022	7.302	Dec 2023	-		7.302	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NSWC, PD : Philadelphia, PA	2.383	6.300	Dec 2021	6.852	Nov 2022	11.900	Nov 2023	-		11.900	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NSWC, CD : Carderock, MD	6.222	10.094	Dec 2021	12.810	Dec 2022	11.074	Dec 2023	-		11.074	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	Various	Various : Various	1.578	3.342	Dec 2021	4.034	Dec 2022	3.488	Dec 2023	-		3.488	0.000	12.442	-
Subtotal			31.592	24.959		30.970		33.764		-		33.764	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPIF	Alion : Arlington, VA	6.332	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Management Support	WR	Various : Various	24.501	2.214	Dec 2021	2.024	Dec 2022	1.992	Dec 2023	-		1.992	Continuing	Continuing	Continuing
Subtotal			30.833	2.214		2.024		1.992		-		1.992	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023			
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603599N / FRIGATE Development					Project (Number/Name) 3086 / Frigate				
	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals	496.359	98.022		108.626		112.972		-		112.972	Continuing	Continuing	N/A	

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

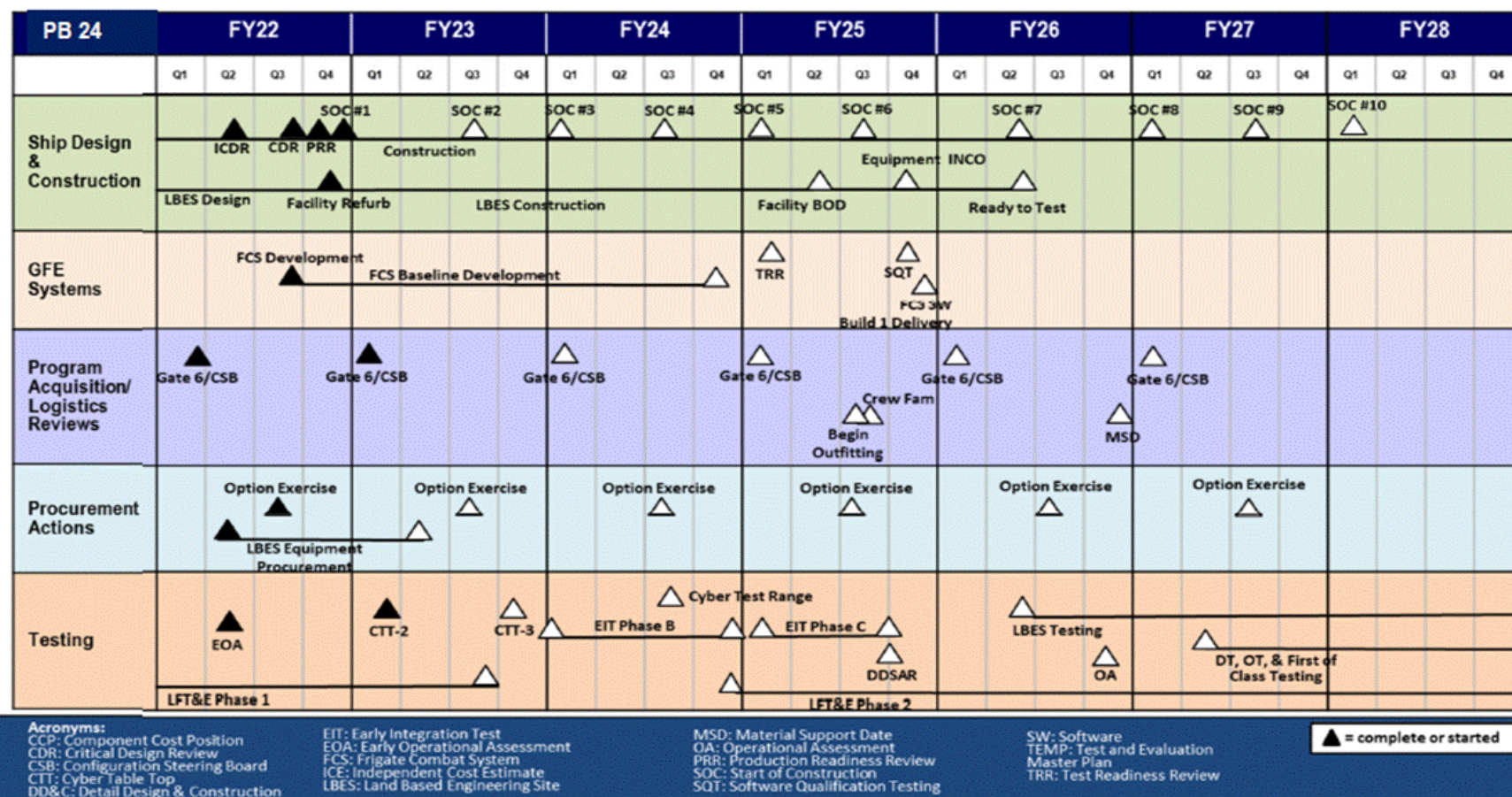
1319 / 4

R-1 Program Element (Number/Name)

PE 0603599N / FRIGATE Development

Project (Number/Name)

3086 / Frigate



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603599N / FRIGATE Development

Project (Number/Name)

3086 / Frigate

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3086				
Ship Design: SOC # 1	4	2022	4	2022
Ship Design: SOC # 2	3	2023	3	2023
Ship Design: SOC # 3	1	2024	1	2024
Ship Design: SOC # 4	3	2024	3	2024
Ship Design: SOC # 5	1	2025	1	2025
Ship Design: SOC # 6	3	2025	3	2025
Ship Design: SOC # 7	2	2026	2	2026
Ship Design: SOC # 8	1	2027	1	2027
Ship Design: SOC # 9	3	2027	3	2027
Ship Design: SOC # 10	1	2028	1	2028
Ship Design: Production Readiness Review	4	2022	4	2022
Ship Design: LBES Design and Construction	1	2022	3	2026
GFE Systems: FCS Baseline Development	3	2022	4	2024
GFE Systems: SW Qualification Testing	4	2025	4	2025
GFE Systems: CS Software Technical Readiness Review (TRR)	1	2025	1	2025
GFE Systems: FCS SW Delivery	4	2025	4	2025
Program Acquisition/Logistics Reviews: Gate 6 /CSB #1	1	2022	1	2022
Program Acquisition/Logistics Reviews: Material Support Date	3	2026	3	2026
Program Acquisition/Logistics Reviews: Gate 6 /CSB #2	1	2023	1	2023
Program Acquisition/Logistics Reviews: Gate 6 /CSB #3	1	2024	1	2024
Program Acquisition/Logistics Reviews: Gate 6 /CSB #4	1	2025	1	2025
Program Acquisition/Logistics Reviews: Gate 6 /CSB #5	1	2026	1	2026

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603599N / FRIGATE Development

Project (Number/Name)

3086 / Frigate

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Program Acquisition/Logistics Reviews: Gate 6 /CSB #6	1	2027	1	2027
Procurement: Option Exercise 1	3	2022	3	2022
Procurement: Option Exercise 2	3	2023	3	2023
Procurement: Option Exercise 3	3	2024	3	2024
Procurement: Option Exercise 4	3	2025	3	2025
Procurement: Option Exercise 5	3	2026	3	2026
Procurement: Option Exercise 6	3	2027	3	2027
Procurement: Option Exercise 7	3	2028	3	2028
Procurement: LBES Equipment Procurement	2	2022	2	2023
Testing: Schedule Detail	1	2022	1	2028
Testing: Live Fire Test & Evaluation (LFT&E) #1	1	2022	3	2023
Testing: Cyber Table Top (CTT)-2	1	2023	1	2023
Testing: Land Based SIM/STIM Testing/Early Integration Risk Reduction Test	3	2026	4	2028
Testing: EIT Phase B	1	2024	4	2024
Testing: Cyber Table Top (CTT-3)	4	2023	4	2023
Testing: EIT Phase C	1	2025	4	2025
Testing: Live Fire Test & Evaluation (LFT&E) #2	4	2024	4	2028
Testing: DDSAR	4	2025	4	2025
Testing: Operational Assessment	4	2026	4	2026
Testing: Early Operational Assessment (OT-B1)	2	2022	2	2022
Testing: TSST	4	2028	4	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603609N / Conventional Munitions							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	270.585	7.245	9.286	9.030	-	9.030	7.270	7.425	7.474	7.624	Continuing	Continuing
0363: Insensitive Munitions Adv. Development	270.585	7.245	9.286	9.030	-	9.030	7.270	7.425	7.474	7.624	Continuing	Continuing

A. Mission Description and Budget Item Justification

Most Navy munitions react violently when exposed to unplanned stimuli such as fire, shock, and bullet or fragment impact, thus presenting a great hazard to ships, aircraft, and personnel. The Insensitive Munitions Advanced Development (IMAD) program will provide, validate, and transition technology to all new weapon developments and priority weapon systems and enable production of munitions insensitive to these stimuli with no reduction in combat performance. Insensitive Munitions (IM) is the Navy's focused effort on propellants, propulsion units, explosives, warheads, fuses, and pyrotechnics to reduce the severity of cook-off and bullet/fragment impact reactions, minimizing the probability for sympathetic detonation, both in normal storage and in use, increasing ship and platform survivability and satisfying performance and readiness requirements.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	7.296	9.286	9.096	-	9.096
Current President's Budget	7.245	9.286	9.030	-	9.030
Total Adjustments	-0.051	0.000	-0.066	-	-0.066
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.051	0.000			
• Program Adjustments	0.000	0.000	-0.074	-	-0.074
• Rate/Misc Adjustments	0.000	0.000	0.008	-	0.008

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603609N / Conventional Munitions				Project (Number/Name) 0363 / Insensitive Munitions Adv. Development			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0363: Insensitive Munitions Adv. Development	270.585	7.245	9.286	9.030	-	9.030	7.270	7.425	7.474	7.624	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Energetic materials producibility is demonstrated to assure national capability to produce and load munitions systems. The program leverages are being closely coordinated with other military departments, North Atlantic Treaty Organization (NATO) and allied countries to eliminate redundant efforts and maximize efficiency. A joint service IM requirement has been developed and through the IM strategic planning process, all Program Executive Offices (PEO) are implementing IM in their priority munitions. IM are identified as a Department of Defense (DoD) critical technology requirement and considered as part of a weapon design. The IMAD program matures the technology developed by a variety of Science and Technology (S&T) sources for program management integration into weapons systems to meet the IM technical deficiencies documented in the PEO IM Strategic Plans. IMAD provides the link between S&T programs and the program managers (PM) by optimizing IM technologies to meet Navy requirements. IMAD offers risk mitigation for the PMs in terms of IM technical knowledge, expertise and manpower with the state of the art expertise across IM products. Each technology area is divided into subtasks addressing specific munition and munition class IM deficiencies.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Insensitive Munitions Adv. Development	7.245	9.286	9.030	0.000	9.030
Articles:	-	-	-	-	-
Description: Validate and assess weapon systems plan of action and milestones for IM compliance. Review Insensitive Munitions Strategic Plan (IMSP) for Navy compile and analyze weapon system, energetic material and generic technology IM test data. Perform Threat Hazard Assessments (THAs). Perform analysis of energetic material properties logistic process. Review IM certification and waivers. Support Insensitive Munitions Council (IMC), Insensitive Munitions Coordination Group (IMCG), and IMC Working Group. Support and develop Insensitive Munitions Technology Tool (IMT2). Support North Atlantic Treaty Organization Standardization Agreement (NATO STANAG) and Advanced Operations (AOP) development. Support IMAD program briefs. Support all Navy Joint Services Insensitive Munitions Technical Panel (JSIMTP) meetings. Support Explosive Safety Working Group (ESWG) meetings. Provide task management support for financial management, review of programmatic deliverables and overall task coordination.					
FY 2023 Plans: Evaluate and demonstrate improved solid propellant for Insensitive Munitions (IM) compliant rocket motor systems and container cook off mitigation. Evaluate and demonstrate new rocket motor case technology that					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603609N / Conventional Munitions	Project (Number/Name) 0363 / Insensitive Munitions Adv. Development			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
can significantly reduce reaction violence of missile and rocket propulsion systems exposed to unplanned stimuli. Develop, demonstrate, and qualify new rocket propellant formulations that meet and/or improve system performance for air launched weapons and meet and/or improve IM goals. Evaluate and demonstrate solid rocket propellant using Highly Loaded Grain technology. Investigate distribute fiber optic sensing for in-situ propellant health monitoring. Develop, demonstrate, and qualify a Reduced Sensitivity Solventless Gun Propellant. Develop, demonstrate, and qualify an enhanced extended range propelling charge for 5" Gun. Evaluate new ordnance and container concepts. Investigate and evaluation of next generation area attack weapon slow heating concepts. Evaluate and demonstrate shape memory alloy rock splitting technology for case venting. Demonstrate IM Improvement through Integral Rocket Solid Fuel Ramjet Technology. Evaluation, demonstration, and qualification of new explosives that reduce collateral damage when bombs are exposed to thermal and impact threats. Develop and demonstrate new and improved stowage and container materials that achieve compliance with IM criteria while significantly reducing the logistics footprint by lowering system weight. Develop and demonstrate ballistic barrier concepts to improve or eliminate IM impact threats in logistical transportation and storage conditions. Characterize new and improved IM explosives with large critical diameters that improve IM and enhance performance. Navy qualification of PBXN-110 and PBXN-112 explosives using new resonant acoustic mixing (RAM).						
FY 2024 Base Plans: Evaluate and demonstrate new rocket motor case technology to reduce reaction violence of missile and rocket propulsion systems (NAWCWD China Lake). Evaluate new ordnance and container concepts (NSWC Indian Head & NSWC Dahlgren). Evaluation, demonstration, and qualification of new explosives that reduce collateral damage when bombs are exposed to thermal and impact threats (NSWC Indian Head). Develop and demonstrate new and improved stowage and container materials that achieve compliance with IM criteria while significantly reducing the logistics footprint by lowering system weight (NSWC Indian Head & NSWC Dahlgren). Qualification of PBXIH-21 (NSWC Indian Head). Demonstrate IM Response of High Energy Density Fuel for Gas Turbine Powered Missile Systems (NAWCWD China Lake). Evaluate and demonstrate improved solid propellant for Insensitive Munitions (IM) compliant rocket motor systems and container cook off mitigation (NAWCWD China Lake). Demonstrate IM Improvement through Integral Rocket Solid Fuel Ramjet Technology (NAWCWD China Lake). Develop and Demonstrate Additively Manufactured High Order Fractal Foam Insulations for Reduced Propellant Ignition from Impact (NAWCWD China Lake). Develop, demonstrate, and qualify new rocket propellant formulations that meet and/or improve system performance for air launched weapons and meet and/or improve IM goals (NAWCWD China Lake). Maturation of test methods across Navy Labs for performance characterization in accordance with AOP-7 (NSWC Indian Head). IM Evaluation						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603609N / <i>Conventional Munitions</i>		Project (Number/Name) 0363 / <i>Insensitive Munitions Adv. Development</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>for Shoulder-launched Assault Munitions LAW FFE (E8, E10) (NSWC Dahlgren). Evaluate and Demonstrate High Energy Insensitive Medium Caliber Gun Propellant Formulations (NSWC Indian Head). Evaluate Nitinol/Ceramic Band to Cut Missile Casing for Slow Cookoff Mitigation (NSWC Dahlgren & NAWC China Lake). Develop, characterize, qualify and transition new explosives that have superior vulnerability characteristics, enhanced performance, comparable or lower manufacturing costs (NSWC Indian Head). Maintenance of SW010-AG-ORD-010 Navy Qualification of Energetics (NSWC Indian Head). Develop/Demonstrate Ordnance Technologies including warhead, fuze & component/system level protection systems (NSWC Indian Head & NSWC Dahlgren). Demonstrate innovative IM Technologies applied to weapon system propulsion (NAWCWD China Lake). Develop and Demonstrate Gun Propulsion Technology for DON applications (NSWC Indian Head).</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The decrease in the amount of \$0.256M is due to the anticipated completion of the following efforts:</p> <p>Investigation and evaluation of next generation area attack weapon slow heating concepts (NSWC Indian Head & NSWC Dahlgren). Evaluation and demonstration of shape memory alloy rock splitting technology for case venting (NSWC Indian Head). Develop and demonstration of ballistic barrier concepts to improve or eliminate IM impact threats in logistical transportation and storage conditions (NSWC Indian Head & NSWC Dahlgren). Characterization of new and improved IM explosives with large critical diameters that improve IM and enhance performance. Navy qualification of PBXN-110 and PBXN-112 explosives using new resonant acoustic mixing (RAM)(NSWC Indian Head). Qualification of PBXIH-136MOD (NSWC Indian Head).</p>						
Accomplishments/Planned Programs Subtotals		7.245	9.286	9.030	0.000	9.030
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy IMAD is assigned as a non-ACAT program and therefore does not have program milestones like the ACAT I to IV programs. IMAD develops and evaluates IM technologies for use in Navy weapon systems and is not part of a particular weapon acquisition program						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603609N / Conventional Munitions				Project (Number/Name) 0363 / Insensitive Munitions Adv. Development					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PROPULSION DEV. AND EVAL.	WR	NAWC DIV/CHINA LAKE : CA	114.882	2.553	Nov 2021	3.288	Nov 2022	3.195	Nov 2023	-		3.195	Continuing	Continuing	Continuing
EXPLOSIVES DEV. AND EVAL.	WR	NSWC/INDIAN HEAD DIV. : MD	94.831	2.490	Nov 2021	2.228	Nov 2022	2.615	Nov 2023	-		2.615	Continuing	Continuing	Continuing
ORDNANCE DEV. AND EVAL.	WR	NSWC/DAHLGREN : VA	31.306	0.737	Nov 2021	1.265	Nov 2022	1.083	Nov 2023	-		1.083	Continuing	Continuing	Continuing
GUN PROPULSION AND EVAL.	WR	NSWC/INDIAN HEAD DIV. : MD	14.531	0.592	Nov 2021	1.144	Nov 2022	0.925	Nov 2023	-		0.925	Continuing	Continuing	Continuing
Subtotal			255.550	6.372		7.925		7.818		-		7.818	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PROGRAM MANAGEMENT SUPPORT	WR	NOSSA : IN HEAD MD	7.175	0.297	Nov 2021	0.364	Nov 2022	0.370	Nov 2023	-		0.370	Continuing	Continuing	Continuing
PROGRAM MANAGEMENT SUPPORT	MIPR	DTIC : FT BELVOIR VA	7.860	0.576	Nov 2021	0.997	Nov 2022	0.842	Nov 2023	-		0.842	Continuing	Continuing	Continuing
Subtotal			15.035	0.873		1.361		1.212		-		1.212	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			270.585	7.245		9.286		9.030		-		9.030	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603609N / Conventional Munitions

Project (Number/Name)

0363 / Insensitive Munitions Adv.
Development

Program Element: 0603609N Project: 0363 Key Events	Pri	FY23				FY24				FY25				FY26				FY27				FY28				FY29			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Investigate and evaluation of next generation area attack weapon slow heating concepts.	2																												
Evaluate and demonstrate solid rocket propellant using Highly Loaded Grain technology.	3																												
Investigate distribute fiber optic sensing for in-situ propellant health monitoring.	3																												
Evaluate and standardize analysis methods for predicting reaction violence in solid rocket propellant motors.	3																												
Characterize new and improved IM explosives with large critical diameters that improve IM and enhance performance	1																												
Develop and demonstrate ballistic barrier concepts to improve or eliminate IM impact threats in logistical transportation and storage conditions	2																												
Qualifiction of PBXIH-136MOD	1																												
Evaluate and demonstrate new rocket motor case technology to reduce reaction violence of missile and rocket propulsion systems	3																												
Evaluation, demonstration, and qualification of new explosives that reduce collateral damage when bombs are exposed to thermal and impact threats.	1																												
Develop and demonstrate improved stowage and container materials that achieve IM compliance with significant reduction to logistics footprint (lower system weight)	2																												
Evaluate and demonstrate Active Hazard Mitigation Device for reduced slow cook-off response	1																												
Evaluate and demonstrate shape memory alloy rock splitting technology for case venting.	2																												
Evaluate and demonstrate improved solid propellant for Insensitive Munitions (IM) compliant rocket motor systems and container cook off mitigation.	3																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603609N / Conventional Munitions

Project (Number/Name)

0363 / Insensitive Munitions Adv.
Development

Program Element: 0603609N Project: 0363 Key Events	Pri	FY23				FY24				FY25				FY26				FY27				FY28				FY29			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Demonstrate IM Improvement through Integral Rocket Solid Fuel Ramjet Technology	3																												
Qualification of PBXIH-21	1																												
Develop, demonstrate, and qualify a Reduced Sensitivity Solventless Gun Propellant.	4																												
Demonstrate IM Response of High Energy Density Fuel for Gas Turbine Powered Missile Systems	2																												
Maturation of test methods across Navy Labs for performance characterization in accordance with AOP-7	1																												
IM Evaluation for Shoulder-launched Assault Munitions LAW FFE (E8, E10)	2																												
Evaluate Nitinol/Ceramic Band to Cut Missile Casing for Slow Cookoff Mitigation	1																												
Develop, demonstrate, and qualify new rocket propellant formulations that meet and/or improve system performance for air launched weapons and meet and/or improve IM goals.	3																												
Develop and Demonstrate Additively Manufactured High Order Fractal Foam Insulations for Reduced Propellant Ignition from Impact	2																												
Evaluate and Demonstrate High Energy Insensitive Medium Caliber Gun Propellant Formulations	4																												
Develop, Demonstrate and Qualify new emergent reduced smoke propellant (NWC-480)	2																												
Develop and Demonstrate venting technology for Integral Rocket Booster Chambers in Ramjet Applications	2																												
Evaluate new ordnance and container concepts.	2																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0603609N / Conventional Munitions

Project (Number/Name)
0363 / Insensitive Munitions Adv.
Development

		FY23				FY24				FY25				FY26				FY27				FY28				FY29				
Program Element: 0603609N Project: 0363 Key Events		Pri	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Evaluate and Demonstrate Alternate Energetic materials in Insensitive Gun Propellant Formulations	4																													
Develop, characterize, qualify and transition new explosives that have superior vulnerability characteristic, enhanced performance, comparable or lower manufacturing costs	1																													
Maintenance of SW010-AG-ORD-010 Navy Qualification of Energetics	1																													
Develop/Demonstrate Ordnance Technologies including warhead, fuze & component/system level protection systems	2																													
Demonstrate innovative IM Technologies applied to weapon system propulsion	3																													
Develop and Demonstrate Gun Propulsion Technology for DON applications	3																													
Qualification of Fastpack Demolition Explosive (FPEX-1)	1																													

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603609N / Conventional Munitions

Project (Number/Name)

0363 / Insensitive Munitions Adv.
Development

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 0363				
Investigate and evaluation of next generation area attack weapon slow heating concepts.	1	2022	2	2023
Evaluate and demonstrate solid rocket propellant using Highly Loaded Grain technology.	1	2022	4	2023
Investigate distribute fiber optic sensing for in-situ propellant health monitoring.	1	2022	1	2023
Evaluate and standardize analysis methods for predicting reaction violence in solid rocket propellant motors.	1	2022	1	2023
Characterize new and improved IM explosives with large critical diameters that improve IM/enhance performance. Qualification of PBXN-110 and PBXN-112 explosives using new resonant acoustic mixing	1	2022	4	2023
Develop and demonstrate ballistic barrier concepts to improve or eliminate IM impact threats in logistical transportation and storage conditions	1	2022	4	2024
Qualification of PBXIH-136MOD	1	2022	4	2024
Evaluate and demonstrate new rocket motor case technology to reduce reaction violence of missile and rocket propulsion systems	1	2022	4	2024
Evaluation, demonstration, and qualification of new explosives that reduce collateral damage when bombs are exposed to thermal and impact threats.	1	2022	4	2024
Develop and demonstrate new and improved stowage and container materials that achieve compliance with IM criteria while significantly reducing the logistics footprint by lowering system weight.	1	2022	4	2025
Evaluate and demonstrate Active Hazard Mitigation Device for reduced slow cook-off response	1	2022	4	2024
Evaluate and demonstrate shape memory alloy rock splitting technology for case venting.	1	2022	4	2025

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603609N / Conventional Munitions		Project (Number/Name) 0363 / Insensitive Munitions Adv. Development	
	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
Evaluate and demonstrate improved solid propellant for Insensitive Munitions (IM) compliant rocket motor systems and container cook off mitigation.	1	2022	4	2025
Demonstrate IM Improvement through Integral Rocket Solid Fuel Ramjet Technology	1	2022	4	2025
Qualification of PBXIH-21	1	2022	4	2024
Develop, demonstrate, and qualify a Reduced Sensitivity Solventless Gun Propellant.	2	2022	4	2025
Demonstrate IM Response of High Energy Density Fuel for Gas Turbine Powered Missile Systems	1	2022	4	2026
Maturation of test methods across Navy Labs for performance characterization in accordance with AOP-7	1	2022	4	2026
IM Evaluation for Shoulder-launched Assault Munitions LAW FFE (E8, E10)	1	2022	4	2026
Evaluate Nitinol/Ceramic Band to Cut Missile Casing for Slow Cookoff Mitigation	1	2022	4	2026
Develop, demonstrate, and qualify new rocket propellant formulations that meet and/ or improve system performance for air launched weapons and meet and/or improve IM goals.	1	2022	4	2027
Develop and Demonstrate Additively Manufactured High Order Fractal Foam Insulations for Reduced Propellant Ignition from Impact	1	2022	4	2027
Evaluate and Demonstrate High Energy Insensitive Medium Caliber Gun Propellant Formulations	1	2022	4	2027
Develop, Demonstrate and Qualify new emergent reduced smoke propellant (NWC-480)	1	2023	4	2027
Develop and Demonstrate venting technology for Integral Rocket Booster Chambers in Ramjet Applications	1	2023	4	2027
Evaluate new ordnance and container concepts.	1	2022	4	2027
Evaluate and Demonstrate Alternate Energetic materials in Insensitive Gun Propellant Formulations	1	2022	4	2028
Develop, characterize, qualify and transition new explosives that have superior vulnerability characteristic, enhanced performance, comparable or lower manufacturing costs	1	2022	4	2028

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603609N / Conventional Munitions

Project (Number/Name)

0363 / Insensitive Munitions Adv.
Development

Events by Sub Project	Quarter	Year	Quarter	Year
Maintenance of SW010-AG-ORD-010 Navy Qualification of Energetics	1	2022	4	2028
Develop/Demonstrate Ordnance Technologies including warhead, fuze & component/ system level protection systems	1	2022	4	2028
Demonstrate innovative IM Technologies applied to weapon system propulsion	1	2022	4	2028
Develop and Demonstrate Gun Propulsion Technology for DON applications	1	2022	4	2023
Qualification of Fastpack Demolition Explosive (FPEX-1)	1	2023	1	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	PE 0603635M / <i>Marine Corps Grnd Cmbt/Supt Sys</i>											
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	117.111	69.451	111.431	128.782	-	128.782	95.520	58.644	59.169	61.341	Continuing	Continuing
1558: <i>Advanced Reconnaissance Vehicle</i>	26.314	37.274	70.583	63.585	-	63.585	42.136	42.946	43.280	45.133	Continuing	Continuing
2614: <i>SMAW Follow-On</i>	23.592	0.509	0.506	0.517	-	0.517	0.542	0.553	0.563	0.575	Continuing	Continuing
3835: <i>Family of Expeditionary Fuel Systems (FEFS)</i>	0.000	0.000	0.000	14.124	-	14.124	6.185	0.000	0.000	0.000	0.000	20.309
6639: <i>Multiple-Launch Rocket System Family of Munitions</i>	0.000	0.000	22.466	19.752	-	19.752	12.089	0.497	0.447	0.456	Continuing	Continuing
7400: <i>Combat Capability Development Transition</i>	67.205	31.668	17.876	30.804	-	30.804	34.568	14.648	14.879	15.177	Continuing	Continuing

A. Mission Description and Budget Item Justification

This PE supports the demonstration and validation of Marine Corps Ground/Supporting Arms Systems for utilization in Marine Air-Ground Expeditionary Force amphibious operations. This program is funded under Demonstration and Validation because it develops and integrates hardware for experimental tests related to specific ground weapon systems.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	66.565	111.431	133.797	-	133.797
Current President's Budget	69.451	111.431	128.782	-	128.782
Total Adjustments	2.886	0.000	-5.015	-	-5.015
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	4.720	0.000			
• SBIR/STTR Transfer	-1.834	0.000			
• Program Adjustments	0.000	0.000	-13.041	-	-13.041
• Rate/Misc Adjustments	0.000	0.000	8.026	-	8.026

Change Summary Explanation

The increase of \$7.901M from FY 2023 to FY 2024 is primarily due to the following programs adjustments within the PE:

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 0603635M / <i>Marine Corps Grnd Cmbt/Supt Sys</i>
<p>1) Family of Expeditionary Fuel Systems (FEFS) increase of \$14.124M is due to realignment of funds from PE 0206623M (BA07/6.7) to PE 0603635M (BA04/6.4) Research Development Testing and Evaluation (RDT&E). \$5.278M of the budget increase supports the advance prototyping development conducted by the Office of Naval Research (ONR) for the Low Profile Distribution System (LPDS).</p> <p>2) Armored Reconnaissance Vehicle (ARV) decrease of \$6.998M in FY 2024 due to completion of Competitive Prototyping.</p> <p>3) Multiple-Launch Rocket System Family of Munitions (MFOM) decrease of \$6.614M from FY 2023 to FY 2024 reflects continued development of the MFoM Launcher (sled and Fire Control System (FCS) and Weapon Control System (WCS) for integration with the ROGUE-Fires carrier as it moves from development into testing.</p> <p>4) Long Range Unmanned Service Vessel (LRUSV) increase of \$7.378M in FY 2024 to begin development and testing of post EOA enhancements to the vessel communication architecture, sensors, autonomy behaviors, and sUSV.</p> <p>5) Explosive Hazard Defeat Systems (EHDS) increase of \$2.550M in FY2024 is due to realignment of funds from PE 0206624M to PE 0603635M. The increase supports development and testing of Ground Penetrating Radar (GPR) sensing integration with air/ground platforms.</p> <p>The FY 2024 funding request was adjusted by \$1.424M to account for the availability of prior year execution balances.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys				Project (Number/Name) 1558 / Advanced Reconnaissance Vehicle			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
1558: Advanced Reconnaissance Vehicle	26.314	37.274	70.583	63.585	-	63.585	42.136	42.946	43.280	45.133	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Advanced Reconnaissance Vehicle (ARV) is imperative to realizing Marine Corps requirements for Fleet Marine Force 2030 as the platform that enables the Mobile Reconnaissance Battalion. As part of the portfolio of reconnaissance, surveillance, and target acquisition systems, ARV will be a purpose-built combat vehicle system, highly mobile on land and water, that can sense, communicate, and fight as the manned hub of a robotic and autonomous systems-enhanced team. Equipped with modern command, control, communications and surveillance systems the ARV will transform the ability of Fleet Marine Forces to sense and communicate within the littoral operating environment by providing a persistent and mobile Systems of Systems to augment and sustain effective sensor webs and kill chains. The ARV is critical towards the modernization of Marine Corps reconnaissance capability.

In FY 2024, the program office will execute contract options and modifications. In an effort to drive down technical and programmatic risk, the government and both vendors will continue a test-fix-test effort focused on sub-system integration, interoperability and performance. The USMC will initiate a Government Systems Integration Lab (GSIL) to integrate the C4 (Command, Control, Computers and Communication) equipment, assess cyber security implementation and validate subsystem technology readiness. In preparation for Engineering and Manufacturing Development (EMD), the program office will procure long lead Government Furnished Property (Network on the Move, C4 critical items, etc) that have been impacted by the current supply chain challenges to support EMD prototype build. Documentation will be completed to support a Request for Proposal (RFP) release in FY 2024 and an ACAT I Milestone B decision in FY 2025.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Advanced Reconnaissance Vehicle	37.274	70.583	63.585	0.000	63.585
Articles:	-	-	-	-	-
FY 2023 Plans: -Complete Competitive Prototype vehicle builds (2) -Complete a modified ACV effort (1) -Complete Competitive Prototype vehicle testing (Live Fire, Operational, Performance) -Initiate Mission Role Variant (MRV) Concept Design -Continue Government Systems Integration Lab / Systems of System (GSIL/SoS) analysis & testing (Interoperability, Network/Comms, and Cyber Security Analysis) -Complete purchase of GFP to support Competitive Prototyping -Initiate Analysis of Alternatives (AoA) Update					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603635M / <i>Marine Corps Grnd Cmbt/Supt Sys</i>		Project (Number/Name) 1558 / <i>Advanced Reconnaissance Vehicle</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
-Continue MS B documentation development -Initiate and complete Business Case Analysis (BCA) -Initiate Front End Analysis / Training Systems Requirement Analysis -Initiate and complete Refurb of Prototypes FY 2024 Base Plans: -Complete purchase of Government Furnished Property (GFP) to support EMD -Complete Analysis of Alternatives (AoA) Update -Complete EMD RFP Documentation (Systems Engineering Plan (SEP), Test & Evaluation Master Plan (TEMP), Acquisition Strategy, Acquisition Plan, Life Cycle Sustainment Plan (LCSP), etc) -Release EMD RFP -Conduct Source Selection and Evaluation -Complete MRV Concept Design -Initiate subsystem risk reduction and Prototype Vehicles test-fix-test effort with industry partners -Continue GSIL/SoS analysis & testing (Interoperability, Network/Comms, and Cyber Security Analysis) -Continue Front End Analysis / Training Systems Requirement Analysis -Update and Complete MS B Documentation (SEP, TEMP, Acquisition Strategy, Acquisition Plan, LCSP, etc) FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Decrease of \$6.998M from FY 2023 to FY 2024 due to completion of Competitive Prototyping.						
Accomplishments/Planned Programs Subtotals		37.274	70.583	63.585	0.000	63.585
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
Leveraging Middle Tier Acquisition (MTA) Authority for Rapid Prototyping, ARV completed a prototyping phase in FY 2021-FY 2023. The total cost of the MTA prototyping effort was \$124.946M.						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
1319 / 4	PE 0603635M / Marine Corps Grnd Cmbt/Supt Sys	1558 / Advanced Reconnaissance Vehicle
<p>Upon successful completion of the prototyping phase and USMC decision to move forward with a purpose built system, ARV intends to proceed to a Milestone B decision point in FY 2025. The USMC is positioned to execute EMD through full and open FAR based competition leading to Milestone C in FY 2028. The program is expected to complete IOC in FY 2030 and FOC of the initial variant in FY 2033.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys				Project (Number/Name) 1558 / Advanced Reconnaissance Vehicle					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Development & Demo.	C/FFP	ONR; NIWC-A : Arlington, VA; Charleston, SC	6.421	3.419	Jan 2022	16.803	Nov 2022	0.000		-		0.000	0.000	26.643	-
Prototype Manufacturing	C/FFP	BAE; General Dynamics Land Systems; Textron : Sterling Heights MI Sterling Heights MI Slidell LA	6.250	18.750	Mar 2022	2.800	Dec 2022	0.000	Dec 2023	-		0.000	Continuing	Continuing	Continuing
Government Furnished Property	C/FFP	DLA : Philadelphia, PA	4.146	2.335	Jan 2022	1.913	Nov 2022	0.000		-		0.000	0.000	8.394	-
Subsystem Risk Reduction Effort	C/FFP	General Dynamics Land Systems; Textron : Sterling Heights MI; Slidell LA	0.000	0.000		0.000		12.368	Dec 2023	-		12.368	0.000	12.368	-
Government Furnished Property EMD	C/FFP	DLA : Philadelphia, PA	0.000	0.000		0.000		9.032	Dec 2023	-		9.032	0.000	9.032	-
Subtotal			16.817	24.504		21.516		21.400		-		21.400	Continuing	Continuing	N/A
Remarks															
Subsystem Risk Reduction Effort increase supports contract actions to utilize prototype vehicles. Includes Systems Engineering, Field Service Representatives, System Support Package, lease/transportation and maintenance of vehicles, and refurbishment of vehicles to return in delivered condition.															
Government Furnished Property EMD increase supports long lead Government Furnished Property (Network on the Move, C4 critical items, etc.) that are currently impacted by supply chain challenges. These components are required to support EMD prototype design and builds in the late FY25 or early FY26 timeframe.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Mgmt - LAV	MIPR	TACOM : Warren, MI	7.518	8.455	Dec 2021	13.456	Dec 2022	15.834	Dec 2023	-		15.834	Continuing	Continuing	Continuing
Studies & MS Document Prep.	MIPR	GVSC : Warren, MI	0.242	0.546	Jan 2022	2.756	Jan 2023	3.500	Jan 2024	-		3.500	0.000	7.044	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys					Project (Number/Name) 1558 / Advanced Reconnaissance Vehicle				
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
National Advanced Mobility Consortium Fees	MIPR	GVSC : Warren, MI	0.285	0.712	Mar 2022	0.133	Dec 2022	0.000		-		0.000	0.000	1.130	-
Source Selection and Evaluation Board	MIPR	Various : Warren, MI	0.000	0.000		0.000	Jun 2023	3.747	Jun 2024	-		3.747	0.000	3.747	-
Subtotal			8.045	9.713		16.345		23.081		-		23.081	Continuing	Continuing	N/A
Remarks															
Program Support total increase provides additional funding for support of EMD Contract Development & RFP Release, EMD Source Selection and Evaluation Board, update to the AoA, and MS B documentation/ramp up to an ACAT 1 Program of Record. The ARV Program will require resources to support preparation of the EMD Contract Scope of Work, Evaluation Criteria/Instructions to Offerors (Sections L&M) and RFP Release. Increased program support is required to support the development of all the documents necessary for a successful MS B Decision and ramp up to an ACAT 1 Program of Record. Source Selection Evaluation Board (SSEB) increase supports ACAT I level SSEB efforts after Q2FY24 RFP Release and through Q2FY25 EMD contract award to include salaries, office space lease, and supplies.															
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	MIPR	Various : Various	0.014	3.057	Jul 2022	30.222	Nov 2022	19.104	Nov 2023	-		19.104	0.000	52.397	-
Subtotal			0.014	3.057		30.222		19.104		-		19.104	0.000	52.397	N/A
Remarks															
Decrease in Test and Evaluation is due to the completion of competitive prototype testing. Ongoing test and evaluation in FY 2024 supports continued test-fix-test cycles on prototypes during the Subsystem Risk Reduction Effort to reduce risk and inform contractor development. This is critical to posture the government and industry for EMD. The test risk reduction addresses required cyber enhancements and opportunities to learn and improve the system resilience prior to EMD.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AoA Support Contract	C/FFP	HII-MDIS; Technomics :	1.438	0.000		2.500	Nov 2022	0.000		-		0.000	0.000	3.938	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys				Project (Number/Name) 1558 / Advanced Reconnaissance Vehicle					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Huntsville, AL; Arlington, VA													
Subtotal			1.438	0.000		2.500		0.000		-		0.000	0.000	3.938	N/A
Remarks															
AoA Support Contract decrease is due to completion of AoA update.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			26.314	37.274		70.583		63.585		-		63.585	Continuing	Continuing	N/A
Remarks															
Advanced Reconnaissance Vehicle (ARV) decreases from FY 2023 to FY 2024 primarily due to completion of Competitive Prototyping but with continued ramp up of requirements to support the next phase of the program: GSIL/SoS Analysis, Prototype Vehicles Test-Fix-Text, Support to prepare for Milestone B for an ACAT 1 Program (Milestone Documentation, Contract Development, AoA update, and RFP release) and activities required to support EMD RFP release and Source Selection.															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

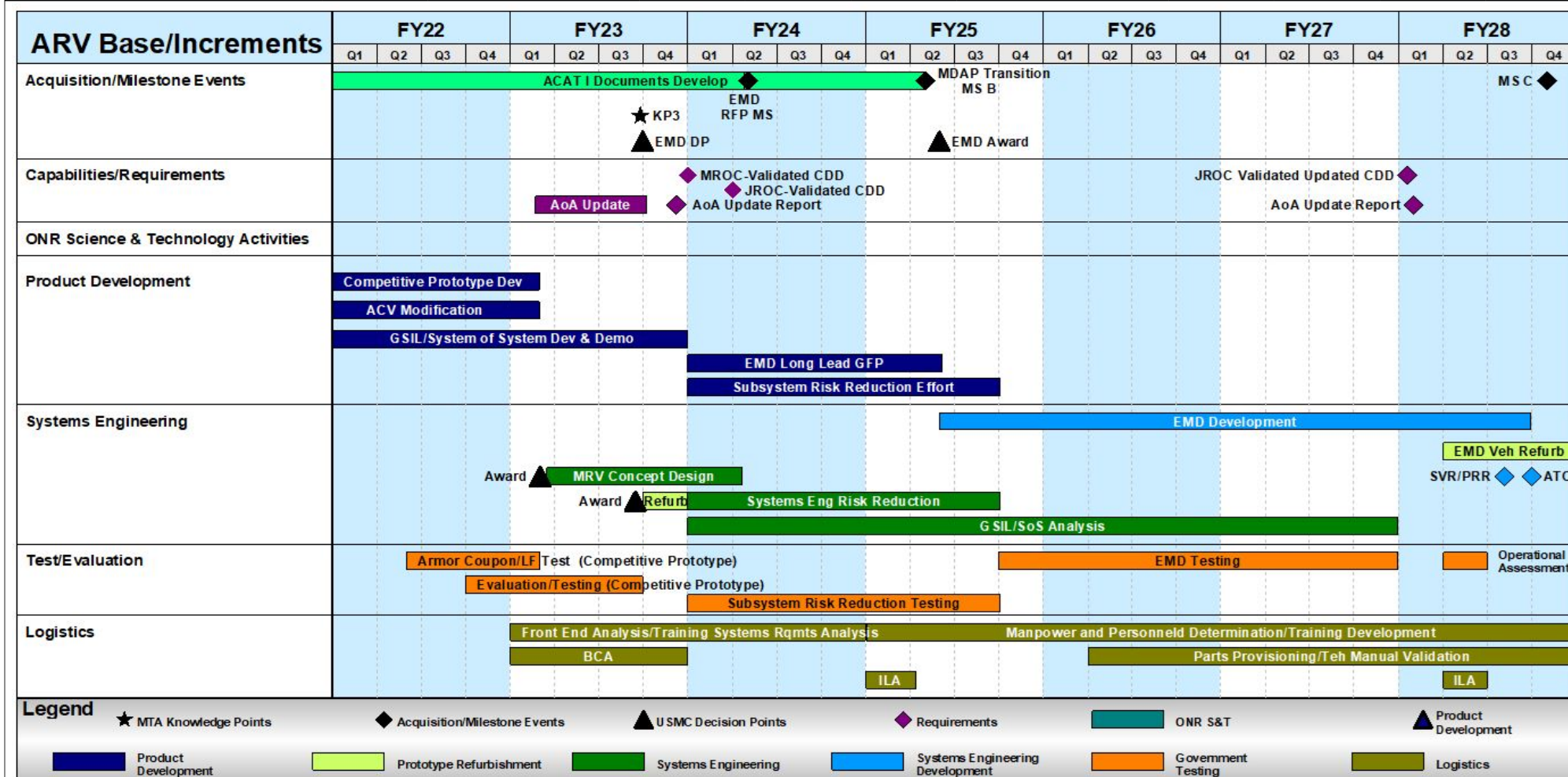
1319 / 4

R-1 Program Element (Number/Name)

PE 0603635M / Marine Corps Grnd Cmbt/S
upt Sys

Project (Number/Name)

1558 / Advanced Reconnaissance Vehicle



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys	Project (Number/Name) 1558 / Advanced Reconnaissance Vehicle	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Project C1558 ARV</i>				
Competitive Prototype Dev	1	2022	1	2023
GSIL/SoS Dev & Demo	1	2022	4	2023
Armor Coupon/Live Fire Testing	2	2022	1	2023
Competitive Prototype Eval/Test	4	2022	3	2023
MRV Concept Design	1	2023	2	2024
RFP Release for EMD	2	2024	2	2024
EMD Long Lead GFP	1	2024	2	2025
GSIL/SoS Analysis	1	2024	4	2027
Systems Engineering Risk Reduction	1	2024	3	2025
Subsystem Risk Reduction Effort	1	2024	3	2025
Subsystem Risk Reduction Testing	1	2024	3	2025
MS B and EMD Contract Award	2	2025	2	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/Supt Sys				Project (Number/Name) 2614 / SMAW Follow-On			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2614: SMAW Follow-On	23.592	0.509	0.506	0.517	-	0.517	0.542	0.553	0.563	0.575	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The solution to the Shoulder-launched Multipurpose Assault Weapon (SMAW) Follow on capability requirement is a Family of Marine-portable Rocket Systems. The Family of Systems include the SMAW MK-153 Mod 0, SMAW MK-153 Mod 2, and the Multi-purpose Anti-Armor Weapon System (MAAWS) M3A1. The MAAWS M3A1 is a multipurpose, man-portable, line-of-sight, reloadable, recoilless, anti-armor and anti-personnel weapon system. This system will enable the Marine Infantry and Combat Engineer Squads to engage in offensive and defensive operations with anti-armor, anti-personnel, anti-material, and assault capabilities. The MAAWS consists of the M3A1 Carl Gustaf Recoilless Rifle, Fire Control System and red dot back up sight. Munitions include two Sub-caliber Adapter Training Devices and a suite of 84mm ammunition with greater capabilities than the SMAW Mod 2 system.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: MAAWS High Explosive (HE) Programmable Round Articles: FY 2023 Plans: -Complete Marine Corps-specific qualification testing of High Explosive (HE) programmable round effort developed by the Army. FY 2024 Base Plans: N/A FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Decrease of \$0.060M from FY 2023 to FY 2024 due to completion of qualification testing of High Explosive (HE) programmable round.								0.222	0.060	0.000	0.000	0.000
								-	-	-	-	-
Title: MAAWS Fire Control System (FCS) Articles: FY 2023 Plans: N/A FY 2024 Base Plans:								0.287	0.000	0.000	0.000	0.000
								-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys		Project (Number/Name) 2614 / SMAW Follow-On		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
FY 2024 OCO Plans: N/A						
Title: Ammunition (Rockets) MAAWS Weapon System Articles:		0.000 -	0.446 -	0.000 -	0.000 -	0.000 -
FY 2023 Plans: -Initiate and complete the testing and evaluation of new ammunition (rockets) for the Multi-purpose Anti-Armor Weapon System (MAAWS) to include the procurement of test articles and evaluation of ammunition at designated test facilities.						
FY 2024 Base Plans: N/A						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: -Decrease of \$0.446M from FY 2023 to FY 2024 due to completion of the testing and evaluation of new ammunition (rockets) for the Multi-purpose Anti-Armor Weapon System (MAAWS).						
Title: MAAWS Sustainment Engineering Articles:		0.000 -	0.000 -	0.230 -	0.000 -	0.230 -
Description: -Conduct ongoing activities required to mitigate obsolescence and extend service life of fielded MAAWS systems, to include barrel safe service life certification, implementation of system diagnostic software, and evaluation and mitigation of quality and safety issues.						
FY 2023 Plans: N/A						
FY 2024 Base Plans: -Initiate activities required to mitigate obsolescence and extend service life of fielded MAAWS systems.						
FY 2024 OCO Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy								Date: March 2023				
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys				Project (Number/Name) 2614 / SMAW Follow-On				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A												
FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$0.230M from FY 2023 to FY 2024 is due to initiating activities required to mitigate obsolescence and extend service life of fielded MAAWS systems.												
Title: MAAWS System Modernization Articles: Description: -Execute modernization efforts to improve the combat capability of the MAAWS weapon system through qualification of new or improved ammunition (rocket) types, implementation of enhanced ballistic software, incorporation of new/improved solutions for rifle/ammo transport, and other enhancements to improve performance and safety. FY 2023 Plans: N/A FY 2024 Base Plans: -Initiate modernization efforts to improve the combat capability of the MAAWS weapon system. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$0.287M from FY 2023 to FY 2024 is due to initiating modernization efforts to improve the combat capability of the MAAWS weapon system.								0.000 -	0.000 -	0.287 -	0.000 -	0.287 -
Accomplishments/Planned Programs Subtotals								0.509	0.506	0.517	0.000	0.517
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
• PMC/3016: Multi-role Anti-Armor Anti-personnel Weapon System (MAAWS)	20.481	21.419	23.627	-	23.627	9.860	1.526	1.555	1.585	0.000	245.021	
Remarks												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys	Project (Number/Name) 2614 / SMAW Follow-On
<p>D. Acquisition Strategy</p> <p>Multi-purpose Anti-Armor Weapon System (MAAWS) is Multi-Role Anti-Armor Anti-Personnel Weapon System. The Marine Corps is leveraging two US Army sole source, Firm Fixed Price, Indefinite Delivery and Indefinite Quantity (SS/IDIQ) contracts to procure the M3A1 Rifle from Saab Dynamics and the Fire Control System (FCS) from Aimpoint. The Army's Basic Ordering Agreement for the Sub Caliber Adapter, the FCS, is through a US Special Operations Command sole source, Firm Fixed Price Contract, and the ammunition through US Army contracts with Department of Defense Ordnance Technology Consortium (DOTC). USMC is a participant in this Army-led program.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/Supt Sys					Project (Number/Name) 2614 / SMAW Follow-On				
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Cumulative Funding	Various	Various : Various	17.685	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			17.685	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NSWC Crane : Crane, IN	0.000	0.287	Feb 2022	0.000		0.000		-		0.000	0.000	0.287	-
Developmental Test & Evaluation (DT&E)	WR	NSWC Indiana : Crane, Indiana	0.000	0.222	Nov 2021	0.060	Nov 2022	0.000		-		0.000	0.000	0.282	-
Live Fire Test & Evaluation (LFT&E)	SS/FFP	AFRL (Miltech) : Montana	0.000	0.000		0.446	Feb 2023	0.000		-		0.000	0.000	0.446	-
Developmental Test & Evaluation (DT&E)	MIPR	ATC : Aberdeen, MD	0.000	0.000		0.000		0.230	Feb 2024	-		0.230	0.000	0.230	-
Developmental Test & Evaluation (DT&E)	MIPR	NSWC IH : Indian Head, MD	0.000	0.000		0.000		0.287	Mar 2024	-		0.287	0.000	0.287	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	Various	Various : Various	0.492	0.000		0.000		0.000		-		0.000	0.000	0.492	-
Subtotal			0.492	0.509		0.506		0.517		-		0.517	0.000	2.024	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Cumulative Funding	Various	Various : Various	5.415	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			5.415	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023			
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys					Project (Number/Name) 2614 / SMAW Follow-On				
		Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		23.592	0.509		0.506		0.517		-		0.517	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy														Date: March 2023																											
Appropriation/Budget Activity 1319 / 4														R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys														Project (Number/Name) 2614 / SMAW Follow-On													
Proj 2614														FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
														1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
MAAWS Fire Control System														Evaluation and Qualification Testing				Ammunition (Rockets) MAAWS Weapon System																							
MAAWS System Modernization																		Evaluation and Qualification Testing																							
MAAWS Sustainment Engineering																		Evaluation and Qualification Testing																							

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys	Project (Number/Name) 2614 / SMAW Follow-On	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2614				
MAAWS Fire Control System: Evaluation and Qualification Testing	1	2022	4	2022
MAAWS Fire Control System: Ammunition (Rockets) MAAWS Weapon System	2	2023	4	2023
MAAWS System Modernization: Evaluation and Qualification Testing	2	2024	2	2025
MAAWS Sustainment Engineering: Evaluation and Qualification Testing	2	2024	2	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys				Project (Number/Name) 3835 / Family of Expeditionary Fuel Systems (FEFS)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3835: Family of Expeditionary Fuel Systems (FEFS)	0.000	0.000	0.000	14.124	-	14.124	6.185	0.000	0.000	0.000	0.000	20.309
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Family of Expeditionary Fuel Systems (FEFS) is a line that contains highly versatile fuel systems in support of Fleet Marine Force (FMF) operations. The family contains individual Table of Allowance Material Control Numbers which support FMF and Marine Air-Ground Task Force (MAGTF) operations and future operating concepts by providing all aspects of land and littoral-based fuel support to include receiving, test, additization, storage, sensors and metering, transfer and dispensing of fuel.												
In FY 2024, funds transition from Proj 7400 to Proj 3835.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Family of Expeditionary Fuel Systems (FEFS) Articles: FY 2023 Plans: N/A FY 2024 Base Plans: Continue research and development of the LPDS capability under development by the Office of Naval Research, developing sub-components, integrating autonomy, and supporting testing and certifications to improve the system's technology readiness level. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: The FY 2023 to FY 2024 increase is due to realignment of funds from PE 0206623M; in FY23 PE 0206623 funding was \$8.846M. Additionally there is a \$5.278M increase to support the advance prototyping development conducted by the Office of Naval Research (ONR) for the Low Profile Distribution System (LPDS).								0.000	0.000	14.124	0.000	14.124
								-	-	-	-	-
Accomplishments/Planned Programs Subtotals								0.000	0.000	14.124	0.000	14.124

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023	
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/Supt Sys				Project (Number/Name) 3835 / Family of Expeditionary Fuel Systems (FEFS)			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• PMC/6277: Family of Expeditionary Fuel Systems	2.161	7.854	12.956	-	12.956	30.458	32.923	31.522	32.506	Continuing	Continuing
• RDTE/PE0603635M/7400: Family of Expeditionary Fuel Systems; LPDS	4.700	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• RDTE/PE0206623M/2503: Family of Expeditionary Fuel Systems	0.665	8.846	1.374	-	1.374	9.694	10.895	7.025	7.160	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
Family of Expeditionary Fuel Systems (FEFS): The FEFS acquisition strategy is to continue to collaborate with the Office of Naval Research, MCWL, and CD&I on the fulfillment of the established Technology Deployment Agreement to transition the Low-Profile Distribution System (LPDS) prototype development effort.											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys				Project (Number/Name) 3835 / Family of Expeditionary Fuel Systems (FEFS)					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Family of Expeditionary Fuel Systems	MIPR	ONR : Arlington, VA	0.000	0.000		0.000		13.137	Feb 2024	-		13.137	0.000	13.137	-
Family of Expeditionary Fuel Systems	MIPR	Various : Various	0.000	0.000		0.000		0.987	Feb 2024	-		0.987	0.000	0.987	-
Subtotal			0.000	0.000		0.000		14.124		-		14.124	0.000	14.124	N/A
Remarks The FY 2023 to FY 2024 increase is to support the advance prototyping development conducted by the Office of Naval Research (ONR) for the Low-Profile Distribution System (LPDS)															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		0.000		14.124		-		14.124	0.000	14.124	N/A
Remarks															

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Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0603635M / *Marine Corps Grnd Cmbt/S*
upt Sys

Project (Number/Name)
3835 / *Family of Expeditionary Fuel Systems (FEFS)*

Project 3835 FEFS	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
										Full Scale Autonomy Integration/Testing																		
										USMC Experimentation																		
										Full Scale USV/IMS Integrated Test																		

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys	Project (Number/Name) 3835 / Family of Expeditionary Fuel Systems (FEFS)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Project 3835 FEFS				
Low Profile Distribution System: Full Scale Autonomy Integration/Testing	2	2024	1	2025
Low Profile Distribution System: USMC Experimentation	3	2024	1	2025
Low Profile Distribution System: Full Scale USV/IMS Integrated Test	3	2024	2	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys				Project (Number/Name) 6639 / Multiple-Launch Rocket System Family of Munitions			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
6639: Multiple-Launch Rocket System Family of Munitions	0.000	0.000	22.466	19.752	-	19.752	12.089	0.497	0.447	0.456	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This line develops a Multiple Launch Rocket System (MLRS) Family of Munitions (MfOM) launcher to be integrated on the Remotely Operated Ground Unit for Expeditionary Fires (ROGUE-Fires) carrier. This development provides Medium-range Missile (MMSL) batteries the capability to utilize the ROGUE-Fires carrier for either Navy Marine Expeditionary Ship Interdiction System (NMESIS) launchers with Naval Strike Missiles (NSM) or MfOM launchers capable of firing the entire MfOM currently employed by HIMARS units. This is a key capability in the CMC's Force Design artillery modernization plan that will increase the vehicle commonality and the employment flexibility throughout the artillery regiments and Marine Littoral Regiments.

The MfOM launcher will consist of a MfOM launch unit, Fire Control System (FCS), and a Weapon Control System (WCS). The MfOM launcher will be installed on a ground-based, tele-operated carrier (ROGUE-Fires) and when paired with a ROGUE-Fires leader kit will control up to three launchers per section. The launcher will be capable of firing the Guided Multiple Launch Rocket System (GMLRS) missile and the new Precision Strike Missile (PrSM) when fielded.

This effort includes design, development, integration, and test of the MfOM launcher for integration with the ROGUE-Fires carrier. The MfOM launcher makes extensive use of existing systems, including the M142 HIMARS electronics. FY 2023 funding focused on the design and development of the MfOM launcher. FY 2024 continues development and builds two additional MfOM launchers for integration and additional developmental testing in FY 2025.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Multiple-Launch Rocket System Family of Munitions (MfOM)	0.000	22.466	19.752	0.000	19.752
Articles:	-	-	-	-	-
FY 2023 Plans:					
- Initiated design and development of the MfOM launch unit					
- Began repackaging of the HIMARS FCS					
- Initiated design and development of the WCS					
- Purchased one ROGUE-Fires carrier test asset for FY 2024 integration testing and technology demonstration (based on carrier lead times)					
FY 2024 Base Plans:					
- Continue development of the MfOM launch unit					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys		Project (Number/Name) 6639 / Multiple-Launch Rocket System Family of Munitions	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<ul style="list-style-type: none"> - Continue repackaging of the HIMARS FCS - Continue WCS development - Conduct a technology demonstration - Initiate mobility testing - Build two MFoM launchers prototypes for integration and developmental testing in FY25 <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> The net decrease from FY 2023 to FY 2024 reflects reduced MFoM launcher and WCS developmental efforts and increased testing efforts.</p>					
Accomplishments/Planned Programs Subtotals	0.000	22.466	19.752	0.000	19.752

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• 2212: Artillery Weapons Systems	221.347	143.808	165.268	-	165.268	302.261	361.454	296.097	163.386	69.926	2,535.786
Remarks BLI 2212 Artillery Weapons System includes funding for HIMARS, GBASM, and LRF.											
D. Acquisition Strategy The Army and Marine Corps use the current M142 HIMARS launcher to fire GMLRS rockets. The Army is the PICA for the M142 with engineering expertise centered at Huntsville, Alabama Redstone Arsenal. The Marine Corps will develop the new MFoM launcher with the Army AvMC office at Redstone acting as the MFoM launcher integrator. The ROGUE-Fires carrier and leader kits needed for system testing will be procured using an existing Marine Corps production contract.											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys				Project (Number/Name) 6639 / Multiple-Launch Rocket System Family of Munitions					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MFoM Launcher (Launch Unit and FCS) Development	WR	Aviation & Missile Ctr : Redstone Arsenal, AL	0.000	0.000		11.214	Feb 2023	6.038	Nov 2023	-		6.038	0.000	17.252	-
MLU Prototype	WR	Aviation & Missile Ctr : Redstone Arsenal, AL	0.000	0.000		0.954	Feb 2023	2.003	Nov 2023	-		2.003	0.000	2.957	-
MFoM WCS and Software Development	WR	Aviation & Missile Ctr : Redstone Arsenal, AL	0.000	0.000		6.750	Mar 2023	5.764	Nov 2023	-		5.764	0.000	12.514	-
ROGUE Fires Carrier Test Asset	C/BA	Oshkosh : Oshkosh, WI	0.000	0.000		1.088	Mar 2023	0.000		-		0.000	0.000	1.088	-
Subtotal			0.000	0.000		20.006		13.805		-		13.805	0.000	33.811	N/A
Remarks															
The decrease from FY 2023 to FY 2024 reflects decreased MFoM launcher and WCS developmental efforts as the program initiates testing.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Safety	MIPR	MCSC : Stafford, VA	0.000	0.000		0.177	Feb 2023	0.178	Dec 2023	-		0.178	0.000	0.355	-
Cybersecurity/AI	WR	NSWC : Indian Head, MD	0.000	0.000		0.146	Feb 2023	0.148	Nov 2023	-		0.148	0.000	0.294	-
Human Systems Integration	WR	NSWC : Dahlgren, VA	0.000	0.000		0.257	Feb 2023	0.259	Nov 2023	-		0.259	0.000	0.516	-
Subtotal			0.000	0.000		0.580		0.585		-		0.585	0.000	1.165	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys						Project (Number/Name) 6639 / Multiple-Launch Rocket System Family of Munitions			
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	Various	various : various	0.000	0.000		1.795	Feb 2023	5.274	Jan 2024	-		5.274	0.000	7.069	-
Subtotal			0.000	0.000		1.795		5.274		-		5.274	0.000	7.069	N/A
Remarks The increase from FY 2023 to FY 2024 reflects developmental testing to include a technology demonstration and initiation of mobility testing efforts.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MFoM travel	Various	MCSC : Not Specified	0.000	0.000		0.085	Nov 2022	0.088	Nov 2023	-		0.088	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.085		0.088		-		0.088	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		22.466		19.752		-		19.752	Continuing	Continuing	N/A
Remarks															

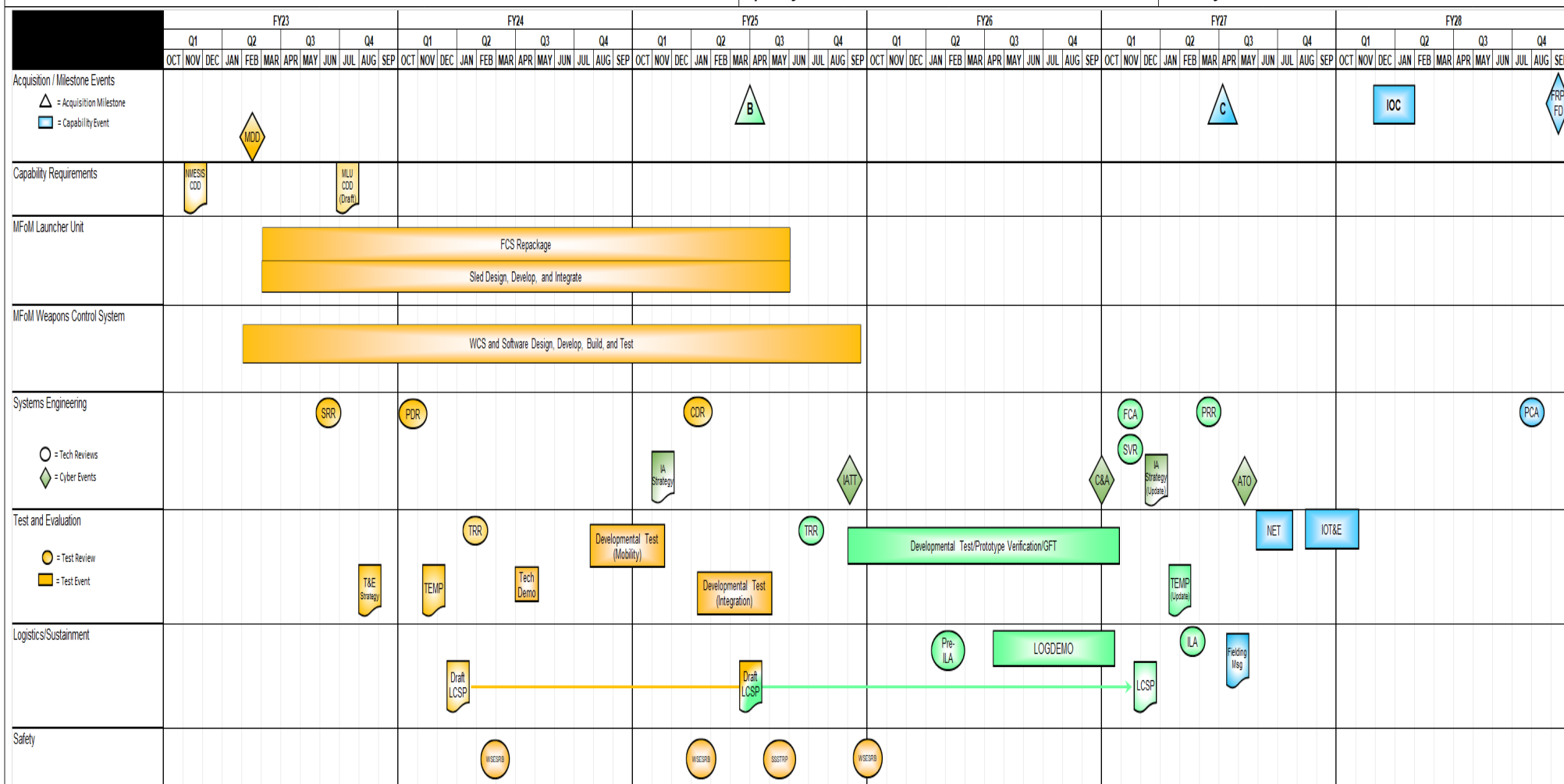
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PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*
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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys
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Project (Number/Name) 6639 / Multiple-Launch Rocket System Family of Munitions



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys	Project (Number/Name) 6639 / Multiple-Launch Rocket System Family of Munitions	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 6639				
MFoM Schedule: MFoM Development	2	2023	3	2025
MFoM Schedule: CDR	2	2025	2	2025
MFoM Schedule: Technology Demonstration	3	2024	3	2024
MFoM Schedule: Milestone B	2	2025	2	2025
MFoM Schedule: Developmental Testing Events	3	2024	2	2027
MFoM Schedule: Milestone C	3	2027	3	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys				Project (Number/Name) 7400 / Combat Capability Development Transition			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
7400: Combat Capability Development Transition	67.205	31.668	17.876	30.804	-	30.804	34.568	14.648	14.879	15.177	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Long Range Unmanned Surface Vessel (LRUSV) is a Marine Corps Force Design priority that has demonstrated, through extensive wargaming and simulations, significant operational impact in the Naval Expeditionary Force's surface warfare campaign against peer competitors in the maritime battlespace, particularly when operating within planned sensor and communication networks. As such the LRUSV capability, when fully matured, is a critical element of the CMC's force modernization plan. LRUSVs, employed individually or in formations of multiple vessels under the cognizance of a LRUSV company or subordinate element will be unmanned vessels, capable of conducting semi-autonomous maneuvers in the open ocean for extended periods of time employing tele-operated Organic Precision Fires (OPF) and small Unmanned Surface Vessels (sUSV) in support of sea control and sea denial operations. This prototyping effort will use an incremental approach to deliver capabilities that leverages prototype development to integrate vessels, autonomy packages, Fire Control Application (FCA), and OPF, and will be linked to experimentation and demonstration to reduce technical and integration risk, validate designs, and better inform achievable and affordable requirements, with the ultimate goal of delivering operationally suitable and effective capabilities to the FMF in the late 2020s.

In FY 2023, the Marine Corps conducted an Early Operational Assessment (EOA) with trained Marine operators and LRUSV prototypes to validate employment concepts and further refine requirements. In FY 2024, LRUSV will begin vessel enhancements to the autonomy behaviors, communication architecture, and improvements to the sensor and communication hardware based on EOA findings.

Explosive Hazard Defeat Systems (EHDS) provides capabilities not found in the current Joint land force structure to defeat explosive hazards and protect Marines and equipment while conducting route and area clearance operations. The EHDS will enable Commanders to deliberately operate in explosive hazards environments by detecting and marking explosive hazards, enabling the Commanders to make timely and informed decisions to avoid the explosive hazards, or, if necessary, neutralize explosive hazards that impede their missions.

In FY2024, EHDS funds realigned from PE: 0206624M/Proj 2316 to PE: 0603635M/Proj 7400

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Long Range Unmanned Service Vessel (LRUSV)	26.968	17.876	25.254	0.000	25.254
Articles:	2	-	-	-	-
FY 2023 Plans:					
- Continued government SW development of FCA capabilities and enhancements					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys		Project (Number/Name) 7400 / Combat Capability Development Transition		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div>- Procured twenty munitions test assets in support of EOA</div> <div>- Completed integration of the OPF capability for the Complete System Integration Test (CSIT) and an Early Operational Assessment (EOA)</div> <div>- Completed Operator Course Development and conduct New Equipment Training (NET) for EOA</div> <div>- Conducted CSIT and Early Operational Assessment (EOA)</div> <div>FY 2024 Base Plans:</div> <div>- Continue government SW development of FCA capabilities and enhancements</div> <div>- Initiate vessel enhancements to autonomy behaviors and the communication architecture to support environmental and operational requirements</div> <div>- Initiate development and integration of communication and sensor small Unmanned Support Vessels (sUSV) payloads</div> <div>- Initiate vessel operator training and certification</div> <div>- Initiate on water testing of advanced autonomy behaviors and communication testing between the LRUSV and sUSV</div> <div>FY 2024 OCO Plans:</div> <div>N/A</div> <div>FY 2023 to FY 2024 Increase/Decrease Statement:</div> <div>LRUSV net increase of \$7.378M is to begin development and testing of post EOA enhancements to the vessel communication architecture, sensors, autonomy behaviors, and sUSV.</div>						
<div>Title: Family of Expeditionary Fuel Systems (FEFS)</div> <div>Articles:</div> <div>FY 2023 Plans:</div> <div>N/A</div> <div>FY 2024 Base Plans:</div> <div>N/A</div> <div>FY 2024 OCO Plans:</div> <div>N/A</div>		4.700 -	0.000 -	0.000 -	0.000 -	0.000 -
<div>Title: Explosive Hazard Defeat Systems (EHDS)</div> <div>Articles:</div>		0.000 -	0.000 -	2.550 -	0.000 -	2.550 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys		Project (Number/Name) 7400 / Combat Capability Development Transition		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
FY 2023 Plans: N/A						
FY 2024 Base Plans: - Initiates development and testing of Future Naval Capability of Ground Penetrating Radar (GPR) integration in air/ground platforms.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$2.550M from FY23 to FY24 is due to realignment of funds from PE 0206624M (BA07/6.7) to PE 0603635M (BA04/6.4) The increase supports development and testing of Ground Penetrating Radar (GPR) sensing integration with air/ground platforms.						
Title: Expeditionary Energy Office (E2O)		0.000	0.000	3.000	0.000	3.000
Articles:		-	-	-	-	-
Description: Expeditionary Energy Office (E2O): The Commandant established the USMC Expeditionary Energy Office (E2O), with the mission to analyze, develop, and direct the Marine Corps' energy strategy in order to optimize expeditionary capabilities across all warfighting functions. E2O's role is to advise the Marine Requirements Oversight Council (MROC) on all energy and resource related requirements, acquisitions, and programmatic decisions. This office, both personnel and funding, directly supports execution of the USMC Expeditionary Energy Strategy and Implementation Plan, and priorities identified in Force Design 2030. The Marine Corps program aligns with the Commandant's Planning Guidance, the National Defense Authorization Act, DoD directives and SECNAV goals. This funding will support the achievement of the Strategy, and the activities of the USMC Expeditionary Energy Concepts process, managed by the E2O.						
FY 2023 Plans: N/A						
FY 2024 Base Plans: - Initiate the building and fabrication of a prototype Next Generation Medium Tactical Truck. The smaller and lighter system will use a hybrid electric architecture to reduce fuel consumption, extend operational range, and provide an exportable power capability, use a modular and open systems architecture, incorporate scalable						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy								Date: March 2023				
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys				Project (Number/Name) 7400 / Combat Capability Development Transition				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
armor, facilitate advanced condition-based maintenance; all while improving maneuverability and affordability when compared to the current MTVR.												
FY 2024 OCO Plans: N/A												
FY 2023 to FY 2024 Increase/Decrease Statement: The increase of \$3M is due to due to realignment of funds from PE 0206313M (BA07/6.7) to PE 0603635M (BA04/6.4). The increase supports the tactical vehicle electrification and hybridization research and development efforts.												
Accomplishments/Planned Programs Subtotals								31.668	17.876	30.804	0.000	30.804
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
• 6277: Family of Expeditionary Fuel Systems	2.161	7.854	12.956	-	12.956	30.458	32.923	31.522	32.642	Continuing	Continuing	
• 6520: Explosive Hazard Defeat Systems	0.000	25.311	21.628	-	21.628	11.908	4.037	0.084	0.012	Continuing	Continuing	
Remarks												
D. Acquisition Strategy												
The LRUSV project is using an incremental approach to deliver capabilities that leverage prototype development to integrate vessels, autonomy packages, Fire Control Application (FCA), and Organic Precision Fires (OPF), and will be linked to experimentation and demonstration. Using a Mid-Tier Acquisition (MTA) approach, the Marine Corps will evaluate capability requirements, assess technical maturity, and refine the concept of employment. This approach to capability development will enable the Marine Corps to reduce technical and integration risk, validate designs, and better inform achievable and affordable requirements, with the ultimate goal of delivering operationally suitable and effective capabilities to the Marine Corps and Joint Force in the late-2020s. With the assistance of Naval Sea Systems Command, Program Manager Ships 406, and Naval Surface Warfare Center Carderock, the program office assessed the technical maturity of the unmanned surface vessel industry base paired against the LRUSV concept of operations. Following market research, vendors were invited to respond with a solution for a semi-autonomous vessel prototyping effort. The program office evaluated all proposals and competitively awarded an Other Transaction Agreement (OTA) to a single vendor.												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys	Project (Number/Name) 7400 / Combat Capability Development Transition
<p>The results from the FY 2023 EOA will inform a Marine Corps decision determining long term LRUSV developmental efforts and eventual transition into the Major Capability Acquisition pathway at Milestone B. LRUSV will continue to work with the current vendor on design and integration to mature the LRUSV capability in accordance with the Marine Corps decision.</p> <p>Explosive Hazard Defeat Systems (EHDS): The acquisition strategy is to collaborate with the Office of Naval Research (ONR) on the development and testing of the Future Naval Capability of Ground Penetrating Radar (GPR) integration in air/ground platforms.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy										Date: March 2023	
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys				Project (Number/Name) 7400 / Combat Capability Development Transition			

Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
NMESIS Prior Years	C/CPFF	Various : Various	36.245	0.000		0.000		0.000		-		0.000	0.000	36.245	-
LRUSV SW - Gov	Various	Various : Various	3.222	2.561	Oct 2021	2.908	Oct 2022	3.317	Oct 2023	-		3.317	Continuing	Continuing	Continuing
LRUSV HW/SW - Vendor	C/CPFF	Metal Shark : Jeanerette, LA	0.000	1.525	Dec 2021	2.200	Dec 2022	8.300	Dec 2023	-		8.300	Continuing	Continuing	Continuing
LRUSV Prototype - Vessel/ Autonomy	C/FFP	Metal Shark : Jeanerette, LA	15.033	9.919	Apr 2022	0.000		0.000		-		0.000	0.000	24.952	-
LRUSV Prototype - Contact Vessel	C/CPFF	Metal Shark : Jeanerette, LA	1.708	0.000		0.000		0.000		-		0.000	0.000	1.708	-
LRUSV Prototype - sUSV	C/CPFF	Metal Shark : Jeanerette, LA	0.000	1.230	Dec 2021	0.000		0.000		-		0.000	0.000	1.230	-
LRUSV Prototype - OPF Launcher	C/CPFF	Vendor : TBD	0.000	1.500	Jan 2022	0.000		0.000		-		0.000	0.000	1.500	-
FEFS Low Profile Distribution System	MIPR	ONR : Arlington, VA	0.000	4.700	Aug 2022	0.000		0.000		-		0.000	0.000	4.700	-
EHDS GPR	MIPR	ONR : Arlington, VA	0.000	0.000		0.000		2.550	Jan 2024	-		2.550	0.000	2.550	-
Next Generation Medium Tactical Truck	MIPR	ONR : Arlington, VA	0.000	0.000		0.000		3.000	Jan 2024	-		3.000	0.000	3.000	-
Subtotal			56.208	21.435		5.108		17.167		-		17.167	Continuing	Continuing	N/A

Remarks

LRUSV net increase from FY 2023 to FY 2024 is due to post EOA LRUSV enhancements, to include upgrades to sensors and long range communication hardware, development of enhanced USV and sUSV autonomy behaviors, development of communications architecture, and the integration of communications and sensing sUSV payloads.

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
NMESIS Prior Years	Various	Various : Various	2.247	0.000		0.000		0.000		-		0.000	0.000	2.247	-
LRUSV Engineering Support	Various	Various : Various	2.572	2.697	Oct 2021	2.824	Oct 2022	5.478	Oct 2023	-		5.478	Continuing	Continuing	Continuing
LRUSV Training Support	Various	Various : Various	0.000	1.821	Jan 2022	1.352	Jan 2023	0.850	Jan 2024	-		0.850	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys				Project (Number/Name) 7400 / Combat Capability Development Transition					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			4.819	4.518		4.176		6.328		-		6.328	Continuing	Continuing	N/A
Remarks															
LRUSV net increase from FY 2023 to FY 2024 is a result of hardware and software support on prototype vessels and Field Service Representatives for follow on integration efforts and testing.															
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	Various : Various	2.950	0.000		0.000		0.000		-		0.000	0.000	2.950	-
Developmental Test & Evaluation (DT&E)	Various	Various : Various	1.395	4.751	Dec 2021	6.777	Dec 2022	5.594	Dec 2023	-		5.594	Continuing	Continuing	Continuing
Subtotal			4.345	4.751		6.777		5.594		-		5.594	Continuing	Continuing	N/A
Remarks															
LRUSV net decrease from FY 2023 to FY 2024 reflects the completion of the FY 2023 EOA and the initiation of on-water testing of vessel enhancements in FY 2024.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
NMESIS Prior Years	Various	Various : Various	0.150	0.000		0.000		0.000		-		0.000	0.000	0.150	-
LRUSV Travel	Various	Various : Various	0.273	0.198	Oct 2021	0.222	Jan 2023	0.185	Jan 2024	-		0.185	Continuing	Continuing	Continuing
LRUSV Program/Cost Managment	Various	Various : Various	1.410	0.766	Oct 2021	1.593	Oct 2022	1.530	Oct 2023	-		1.530	Continuing	Continuing	Continuing
Subtotal			1.833	0.964		1.815		1.715		-		1.715	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023				
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/S upt Sys					Project (Number/Name) 7400 / Combat Capability Development Transition					
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			67.205	31.668		17.876		30.804		-		30.804	Continuing	Continuing	N/A

Remarks
LRUSV net increase is to begin development and testing of post EOA enhancements to the vessel communication architecture, sensors, autonomy behaviors, and sUSV.

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PE 0603635M: *Marine Corps Grnd Cmbt/Supt Sys*
Navy

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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603635M / <i>Marine Corps Grnd Cmbt/Supt Sys</i>
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Project (Number/Name)
7400 / *Combat Capability Development Transition*



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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																Date: March 2023			
Appropriation/Budget Activity 1319 / 4										R-1 Program Element (Number/Name) PE 0603635M / Marine Corps Grnd Cmbt/Supt Sys						Project (Number/Name) 7400 / Combat Capability Development Transition			

Proj 7400 Family of Expeditionary Fuel Systems	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603635M / Marine Corps Grnd Cmbt/S
upt Sys

Project (Number/Name)

7400 / Combat Capability Development
Transition

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 7400				
Long Range Unmanned Surface Vessel (LRUSV): Long Range Unmanned Surface Vessel: Complete System Integration Test	1	2023	1	2023
Long Range Unmanned Surface Vessel (LRUSV): Long Range Unmanned Surface Vessel: Early Operational Assessment	3	2023	3	2023
Long Range Unmanned Surface Vessel (LRUSV): Long Range Unmanned Surface Vessel: Post EOA Vessel Enhancements	1	2024	2	2024
Long Range Unmanned Surface Vessel (LRUSV): Long Range Unmanned Surface Vessel: Milestone B	1	2025	1	2025
Long Range Unmanned Surface Vessel (LRUSV): Long Range Unmanned Surface Vessel: Initial Enhancement Testing	3	2024	2	2025
Long Range Unmanned Surface Vessel (LRUSV): Long Range Unmanned Surface Vessel: EMD Design/Integration/Testing	1	2025	2	2027
Long Range Unmanned Surface Vessel (LRUSV): Long Range Unmanned Surface Vessel: Operator Course Continuation Training	3	2024	2	2025
Family of Expeditionary Fuel Systems: Low Profile Distribution Systems: Integrated Med Scale Iv/USV Initial Test	2	2022	1	2024
Family of Expeditionary Fuel Systems: Low Profile Distribution Systems: Environmental Compliance Testing	4	2022	4	2023
Family of Expeditionary Fuel Systems: Low Profile Distribution Systems: Full Scale IV/USV Development and Testing	2	2022	1	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>					R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	628.527	33.974	36.304	44.766	-	44.766	34.069	31.597	32.067	32.221	Continuing	Continuing
0377: <i>JT Service Expl Ord Disp System</i>	378.289	8.609	10.337	12.259	-	12.259	11.776	11.582	11.711	11.946	Continuing	Continuing
1317: <i>Expeditionary Diving Systems</i>	128.458	1.957	4.032	4.321	-	4.321	2.420	2.461	2.512	2.482	Continuing	Continuing
3177: <i>Joint Counter Radio-Controlled IED Elec Warfare</i>	121.780	14.715	10.869	9.510	-	9.510	7.315	7.386	7.468	7.245	Continuing	Continuing
3447: <i>Mine Expeditionary Response Vehicle (MESR)</i>	0.000	8.693	11.066	18.676	-	18.676	12.558	10.168	10.376	10.548	Continuing	Continuing

Note

Maritime Expeditionary Standoff Response (MESR) was realigned from Project 4023 into new Project 3447 beginning in FY22. Project 4023 Expeditionary Underwater Systems was relocated from PE 0603654N to PE 0604028N beginning in FY22.

A. Mission Description and Budget Item Justification

This is a Joint Service Program.

This program provides for the development of Explosive Ordnance Disposal tools and equipment aimed at meeting National Defense Strategy guidance to build a more lethal force. The responsibility is assigned to the Navy as single service manager, per Department of Defense Directive 5160.62E of 8 May, 2011, for management of the Joint Service Explosive Ordnance Disposal Research and Development Program.

Proliferation of sophisticated types of foreign and domestic ordnance and Improvised Explosive Devices necessitate a continuing development program to provide Explosive Ordnance Disposal personnel of all military services with the tools and equipment designed for modularity, scalability, and flexibility, while maintaining readiness to respond to contingencies and ensure long-term warfighting readiness.

This program also provides life support related equipment necessary to support the performance of Navy Explosive Ordnance Disposal tasks underwater. This equipment must have inherently low acoustic and magnetic signatures in order to allow the Explosive Ordnance Disposal technician to safely approach, render-safe and dispose of sea mines and other underwater ordnance.

This program also supports the National Defense Strategy's objective of preventing terrorist and near peer operations against the US, allies, and partners by providing for the research and development of Electronic Warfare (EW) systems, equipment, procedures, and tactical aids for all military services against the threat posed

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development			
by Radio-Controlled Improvised Explosive Devices (RCIEDs) and to prevent initiation of RCIEDs across the spectrum of Joint military operations. It utilizes Joint requirements to provide a system of systems approach for a suite of equipment for mounted, dismounted, and fixed site operations; provides a Joint Counter RCIED EW (CREW) development of equipment, procedures, and tactical aids to make rapid improvements to performance, supportability and affordability, while maintaining pace with the evolving RCIED global threat.					
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	34.785	36.496	39.109	-	39.109
Current President's Budget	33.974	36.304	44.766	-	44.766
Total Adjustments	-0.811	-0.192	5.657	-	5.657
• Congressional General Reductions	-	-0.192			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.811	0.000			
• Program Adjustments	0.000	0.000	-2.000	-	-2.000
• Rate/Misc Adjustments	0.000	0.000	7.657	-	7.657
Change Summary Explanation					
FY2022: -\$0.811 SBIR					
FY2023: N/A					
FY2024: -\$2.000M Terminate Hemlock Program of Record; +\$0.864M rate adjustments. +\$6.59M to address MESR Deep Water Response Proof of Concept efforts.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development				Project (Number/Name) 0377 / JT Service Expl Ord Disp System			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0377: JT Service Expl Ord Disp System	378.289	8.609	10.337	12.259	-	12.259	11.776	11.582	11.711	11.946	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Program Element (PE) Project (0377) provides funding for the detailed design, development, risk mitigation, issue resolution, integrations, test, test equipment, simulations and technology insertion of specialized equipment, tools and assessment of accessories that expand range of military operations required to support DoD's only Joint Explosive Ordnance Disposal (EOD) programs.

EOD exclusively executes world-wide missions for detection/location, identification, render-safe, recovery, field and laboratory evaluation, and disposal of hazards and unexploded ordnance (UXO) that is a threat to military operations, installations, personnel, or material. UXO includes foreign and domestic, both conventional and non-conventional, including Improvised Explosive Devices (IEDs) and devices using radiological and biological means with or without explosives.

As defined in DOD Directive 5160.62E, assigns the Secretary of the Navy (SECNAV) the responsibility of Executive Agent for Explosive Ordnance Disposal (EOD) Technology and Training (T&T) to include the Joint Service Explosive Ordnance Disposal Research and Development Program. EOD programs are designed to reduce the EOD operator's exposure to explosive hazards or limit the risk to an acceptable level. EOD operations range from hand entry of explosive devices by EOD technicians to robotic actions and sensing capabilities that provide a safe distance of the explosive hazard at a greatly reduced cost to trained and experienced EOD operators.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: ANALYSIS OF ALTERNATIVES/ EOD MODERNIZATION	8.036	10.337	12.259	0.000	12.259
Articles:	-	-	-	-	-
FY 2023 Plans: EOD Modernization will leverage the results of the Analysis of Alternatives and advances in technology to rapidly assess and field capability solutions through a sets, kits, and outfits approach. Prototype development, testing, user evaluation, and a family of systems approach in FY2023 will begin to close identified capability gaps in EOD Modernization priorities to include: Standoff Render Safe and Disrupt (SRSD), Rapid Large Area Clearance (RLAC), Access Buried Munitions (ABM), and integration of EOD unmanned systems sensors and payloads. Plans include prototype testing, user evaluation of a compact laser neutralization system and program office transition into the SRSD Family of Systems. Funding will support the completion and approval of Capability Development Documents (CDDs) for each of the aforementioned EOD Modernization efforts. Funding also					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development		Project (Number/Name) 0377 / JT Service Expl Ord Disp System		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
supports the modernization of EOD Unmanned Systems with sensors and payloads integration, testing, and user evaluation/assessment. EOD Modernization efforts include modeling and development of render safe procedures and insertion into associated Joint EOD publications. FY 2024 Base Plans: FY24 Plans for EOD Modernization will build upon the FY23 plan and advance EOD technology to rapidly assess and field capability solutions through a sets, kits, and outfits approach. Leverage FY23 prototype development, testing, user evaluation, and a family of systems (FoS) approach to close identified capability gaps in EOD Modernization priorities to include: Standoff Render Safe and Disrupt (SRSD), Rapid Area Detection (RAD) formerly Rapid Large Area Clearance (RLAC); Rapid Large Area Clearance (RLAC) Joint Capability Technology Demonstration (JCTD), Access Buried Munitions (ABM), Timed Firing Device, and integration of EOD unmanned systems sensors and payloads. Plans include capability development, prototype testing, user evaluation, and transition of SOF equipment. Funding will support the continuation of EOD Modernization efforts to support Joint EOD forces. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$1.695M will support multiple EOD modernization efforts to address the Integrated Priorities Capability List (IPCL) and mitigate capability gaps in order to develop technology and equip Joint EOD Forces counter explosive hazards intended to harm both U.S. and our allies.						
Title: EOD ROBOTICS Articles:		0.573 -	0.000 -	0.000 -	0.000 -	0.000 -
FY 2023 Plans: N/A FY 2024 Base Plans: N/A FY 2024 OCO Plans: N/A						
Accomplishments/Planned Programs Subtotals		8.609	10.337	12.259	0.000	12.259

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development	Project (Number/Name) 0377 / JT Service Expl Ord Disp System
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy Joint Service acquisition strategies maximize, to the greatest extent, evolutionary open architecture and modular strategy for rapid acquisition of mature technology for the user. The evolutionary approach delivers baseline capability and subsequent increments, recognizing up front the need for future capability improvements. Each technology insertion is a militarily useful and supportable operational capability that can be developed, produced, deployed, and sustained. The evolutionary strategy allows for rapid block upgrades, pre-planned product improvements, new accessories that expand range of military operations that provide a significant increase in operational capability and improvements at the modular level and encourages competition and second sources to lower life cycle costs. Modeling and simulation can verify system level compliance in a laboratory, greatly reducing the cost to conduct expensive range testing. EOD Modernization increases technology advances for more capable diagnostics and render-safe systems and EOD tools. Contracting for RDT&E, if required, is always competitive and when feasible, production options are included.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development				Project (Number/Name) 0377 / JT Service Expl Ord Disp System					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NSWCIEODTD : Indian Head, MD	200.076	2.739	Nov 2021	3.829	Nov 2022	3.944	Dec 2023	-		3.944	Continuing	Continuing	Continuing
Primary Hardware Development	C/FFP	John Hopkins, MD : Laurel, MD	12.400	0.975	Nov 2021	0.600	Oct 2022	0.718	Dec 2023	-		0.718	0.000	14.693	-
Integrated Logistics Support	WR	NSWCIEODTD : Indian Head, MD	50.190	0.000		0.750	Nov 2022	0.773	Dec 2023	-		0.773	Continuing	Continuing	Continuing
Primary Software Development	WR	ARL/Army : Aberdeen Proving Ground	5.555	0.150	Nov 2021	0.000		0.000		-		0.000	0.000	5.705	-
Primary Hardware Development	MIPR	Dept of Energy : Albuquerque, NM	1.750	0.273	Nov 2021	1.355	Nov 2022	1.396	Dec 2023	-		1.396	0.000	4.774	-
Primary Hardware Development	Various	ONR : Washington, DC	2.500	2.400	Nov 2021	1.280	Nov 2022	1.930	Dec 2023	-		1.930	0.000	8.110	-
Primary Hardware Development	WR	NSWC Crane Division : Crane, IN	0.000	0.000		0.345	Nov 2022	0.755	Dec 2023	-		0.755	0.000	1.100	-
Primary Hardware Development	WR	NSWC Dahlgren : Dahlgren, VA	0.000	0.000		0.365	Nov 2022	0.876	Dec 2023	-		0.876	0.000	1.241	-
Primary Hardware Development	WR	NSWC Panama City : Panama City, FL	0.000	0.255	Nov 2021	0.000		0.000		-		0.000	0.000	0.255	-
Subtotal			272.471	6.792		8.524		10.392		-		10.392	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NSWCIEODTD : Indian Head, MD	82.513	1.561	Nov 2021	1.607	Nov 2022	1.655	Dec 2023	-		1.655	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	WR	NSWCIEODTD : Indian Head, MD	11.608	0.200	Nov 2021	0.206	Nov 2022	0.212	Dec 2023	-		0.212	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	C/FFP	NRL : Washington, DC	0.200	0.056	Nov 2021	0.000	Nov 2022	0.000		-		0.000	0.000	0.256	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023					
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development						Project (Number/Name) 0377 / JT Service Expl Ord Disp System					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total					
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract		
Subtotal			94.321	1.817		1.813		1.867		-		1.867	Continuing	Continuing	N/A		
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total					
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract		
Program Management Support	WR	NSWCIHEODTD : Indian Head, MD	11.497	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing		
Subtotal			11.497	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A		
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals			378.289	8.609		10.337		12.259		-		12.259	Continuing	Continuing	N/A		
Remarks																	

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0377 / JT Service Expl Ord Disp System

Proj 0377	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
EOD MODERNIZATION																												
	Materiel Solution Analysis SRSD																											
					SRSD (Precision Aim/Render Safe) Technology Maturation and Risk Reduction								SRSD (Precision Aim/Render Safe) Engineering Manufacturing and Develop															
	SRSD (Directed Energy) Technology Deployment Agreement (TDA)																											
	Analysis of Alternatives RAD				RLAC Joint Concept Technology Demonstration (JCTD)																							
					RAD Technology Maturation and Risk Reduction								RAD Engineering and Manufacturing Development															
					TFD Engineering and Manufacturing Development																							
	Material Development ABM																											
					Material Development EOD Unmanned Systems and Payloads																							

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development	Project (Number/Name) 0377 / JT Service Expl Ord Disp System	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 0377				
EOD MODERNIZATION: Materiel Solution Analysis Standoff Render Safe and Disrupt	1	2022	1	2023
EOD MODERNIZATION: Standoff Render Safe and Disrupt (Precision Aim/Render Safe) Technology Maturation and Risk Reduction	1	2022	2	2025
EOD MODERNIZATION: Standoff Render Safe and Disrupt (Precision Aim/Render Safe) Engineering Manufacturing and Development	3	2025	3	2027
EOD MODERNIZATION: Standoff Render Safe and Disrupt (SRSD) (Directed Energy) Technology Deployment Agreement (TDA)	1	2022	4	2023
EOD MODERNIZATION: Rapid Large Area Clearance (RLAC) Joint Concept Technology Demonstration (JCTD)	1	2023	4	2025
EOD MODERNIZATION: Analysis of Alternatives Rapid Area Detection (RAD)	1	2022	4	2022
EOD MODERNIZATION: Rapid Area Detection (RAD) Technology Maturation and Risk Reduction	1	2023	3	2026
EOD MODERNIZATION: Rapid Area Detection (RAD) Engineering and Manufacturing Development	4	2026	2	2028
EOD MODERNIZATION: Timed Firing Device (TFD) Engineering and Manufacturing Development	1	2023	4	2025
EOD MODERNIZATION: Material Development Access Buried Munitions	1	2022	4	2024
EOD MODERNIZATION: Material Development EOD Unmanned Systems and Payloads	2	2023	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development				Project (Number/Name) 1317 / Expeditionary Diving Systems			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
1317: Expeditionary Diving Systems	128.458	1.957	4.032	4.321	-	4.321	2.420	2.461	2.512	2.482	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

These resources support the development of equipment for the Navy's only comprehensive expeditionary detect to engage and exploitation Mine Countermeasures (MCM) capability. Specifically, it provides for development of Diver Safety/Life Support Equipment, Advanced Diver Integrated Sensors and Command Detonation Systems to support Navy Explosive Ordnance Disposal (EOD) underwater operations, expeditionary salvage, and Expeditionary MCM Company operations. The equipment must have inherently low acoustic and magnetic signatures in order to allow the EOD divers to safely detect, reacquire, approach, render-safe, recover, exploit, and dispose of underwater explosive threats to include sea mines, limpet mines, underwater improvised explosive devices, and unexploded ordnance.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: DIVER SAFETY & LIFE SUPPORT SYSTEMS	0.476	2.502	1.750	0.000	1.750
Articles:	-	-	-	-	-
<p>Description: Diver Safety & Life Support Systems: Develop diving equipment and diver safety tools to include life support systems for Explosive Ordnance Disposal (EOD), Expeditionary Mine Countermeasures (ExMCM), and Mobile Diving & Salvage Units (MDSU) operations. Specific tools include, but are not limited to: Underwater Breathing Apparatus (UBA), specialized dive masks, heads-up displays, emergency life support systems, and the capability to train divers and to evaluate ExMCM tools, tactics and procedures including control of signatures with regard to influence fired ordnance.</p> <p>FY 2023 Plans: FY23 efforts will commence the hydrospace, unmanned, and environmental testing of the Multi-Mission Underwater Breathing Apparatus (MMUBA). The MMUBA is a UBA required to support a variety of military diving operations and practices such as deep or shallow water diving, managing heavy and stationary workloads, and swimming appreciable distances. MMUBA is the replacement for the MK 16 MOD 1 Closed Circuit Mixed-Gas UBA, which is approaching the end of its service life. Successful completion of these test events will lead to the conduct of manned testing beginning in FY24, which is critical to demonstrating the safe and effective employment of these life support systems and achieving NAVSEA 00C Certification for use in the Fleet.</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development		Project (Number/Name) 1317 / Expeditionary Diving Systems		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Environmental testing will include magnetic signature characterization and testing in accordance with MIL-DTL-19595D FY 2024 Base Plans: FY24 efforts will focus on completion of the unmanned and environmental testing regimens and initiation of the manned testing of the production representative MMUBA units. These events are needed to achieve full system safety certification of these units. The combined efforts of unmanned, environmental, and manned testing are designed to ultimately support a NAVSEA 00C Certification in accordance with NAVSEA SS800-AG-MAN-010 of the selected MMUBA. A logistics assessment will be conducted in FY24 to verify program lifecycle sustainment plans. These combined results of these evaluations will determine the operational effectiveness and suitability characteristics of the MMUBA and will provide the Objective Quality Evidence (OQE) needed to enter full rate production. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Decrease from FY2023 due to the completion of Hydrospace testing in FY23 and the start-up costs associated with initiation of the unmanned and environmental testing in FY23.						
Title: ADVANCED DIVER INTEGRATED SENSORS (STRIDENT) Articles: Description: Develop Advanced Diver Integrated Sensors equipment (STRIDENT) to enable EOD and MDSU ability to detect, access, neutralize and gather intelligence on underwater targets of interest in support of Expeditionary Mine Countermeasures (ExMCM) and Diving and Salvage missions. Requirements include the validated STRIDENT TLR. FY 2023 Plans: FY23 efforts will conclude the developmental test and evaluation and user evaluation events necessary to demonstrate readiness to enter production through a Knowledge Point (KP) #2 Production Decision. Additionally, a supportability review, and completion of environmental testing will be conducted with delivery of initial production units in late FY23. FY 2024 Base Plans:		1.362 -	1.065 -	0.738 -	0.000 -	0.738 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023				
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development	Project (Number/Name) 1317 / Expeditionary Diving Systems				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
FY24 efforts will focus on delivery and acceptance testing of the initial production units to verify compliance with contractual performance requirements. Upon completion of acceptance testing and resolution of any remaining post-production issues, full rate production can commence. Acceptance testing will include magnetic signature characterization and testing in accordance with MIL-DTL-19595D. Fleet deliveries will commence in FY24. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Decrease from FY2023 due to completion of developmental Test & Evaluation testing in FY23 with associated reduction in FY24 costs.							
Title: COMMAND DETONATION SYSTEMS Articles: Description: Develops next generation of remote underwater firing device to enable EOD technicians to neutralize or otherwise mitigate underwater ordnance hazards from a safe standoff distance. This capability enables a command firing signal to travel from the surface to an in-water receiver to detonate explosive tools ISO ExMCM missions. Improvements from previous underwater firing systems include the ability to encrypt the firing signal. FY 2023 Plans: FY23 efforts will include development of a comprehensive Concept of Operations (CONOPs) that encompasses the entire command detonation stockpile-to-target sequence. FY23 efforts will include development of the performance specification informed by the results of the market survey conducted in FY22, informed by the CONOPS, which defines the capability needed to meet the performance thresholds defined by the RUFIS CDD, expected to be approved in 2Q FY23. FY 2024 Base Plans: FY24 events will include release of a Commercial Solutions Offering (CSO) based on the CONOPS and performance specification leading to award of a Prototype OTA through Defense Innovation Unit (DIU). Delivery of prototypes as a result of the OTA award are anticipated in Q4 FY24. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement:			0.119 -	0.465 -	1.833 -	0.000 -	1.833 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development		Project (Number/Name) 1317 / Expeditionary Diving Systems	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Increase from FY23 to FY24 due to execution of prototype OTA in FY24.					
Accomplishments/Planned Programs Subtotals	1.957	4.032	4.321	0.000	4.321

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• OPN/0977a: Underwater EOD Program (Cost Code UQ034)	15.577	23.084	11.060	-	11.060	9.314	0.000	0.000	0.000	0.000	94.704
Remarks											
D. Acquisition Strategy											
<p>Analysis of Alternatives (AOA) studies and/or alternative system reviews (ASRs) are always conducted prior to the initiation of new sub-projects. The AOA/ASR processes address and emphasize acquisition strategies of the most cost-effective solution over the sub-projects life-cycle. The acquisition strategies observe the following hierarchy of alternatives: commercial item (including modification), non-developmental item (including modification), and lastly, developmental programs. Contracting for RDT&E, if required, is always competitive and when feasible, production options are included. Maximum use of innovative contracting mechanisms will be assessed and pursued where applicable and in the best interest of the Navy. For example, this program is executing two of its acquisition efforts through the middle-tier acquisition (MTA) authorities to accelerate fielding of effective and suitable materiel solutions to the fleet.</p>											

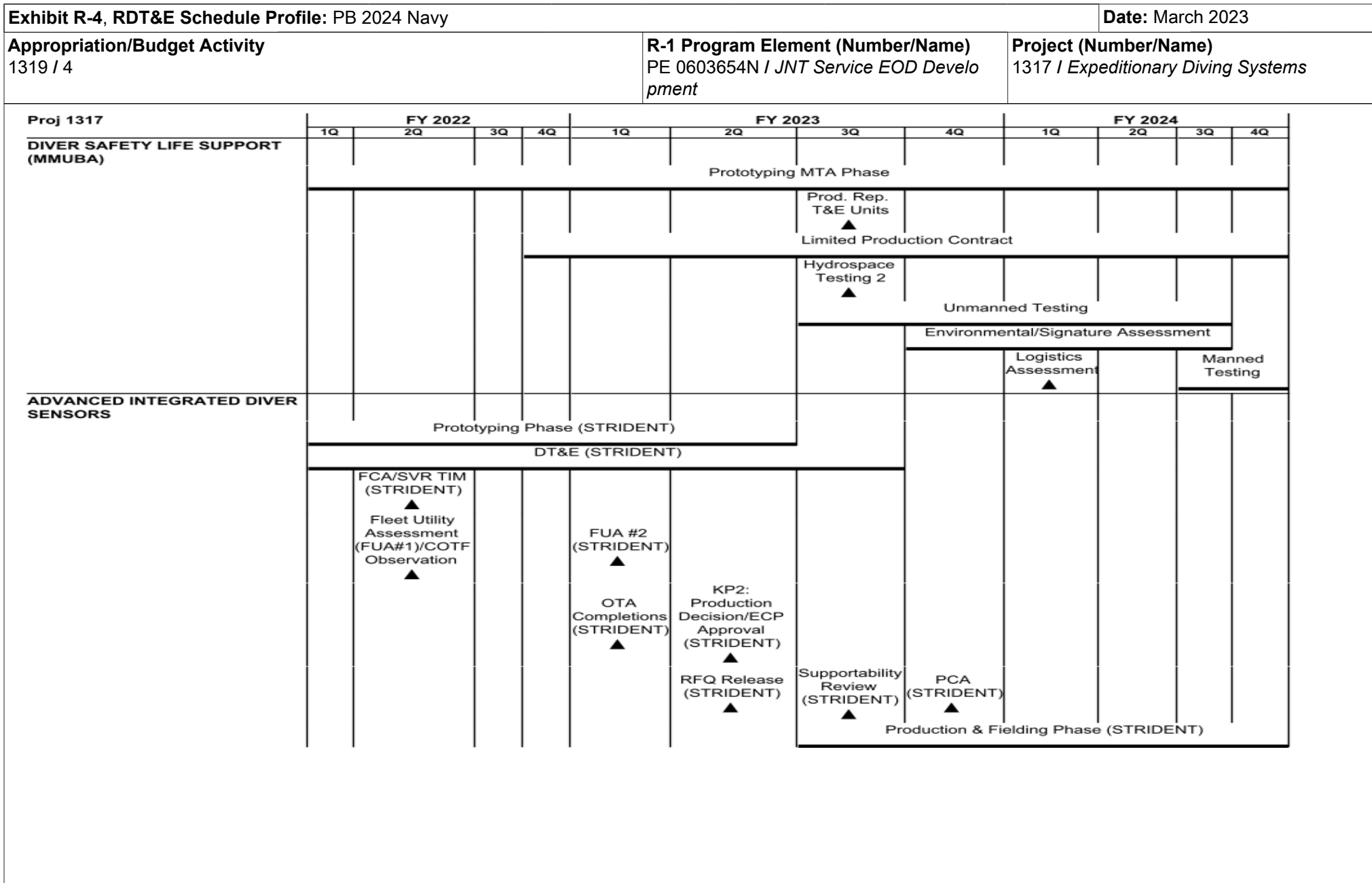
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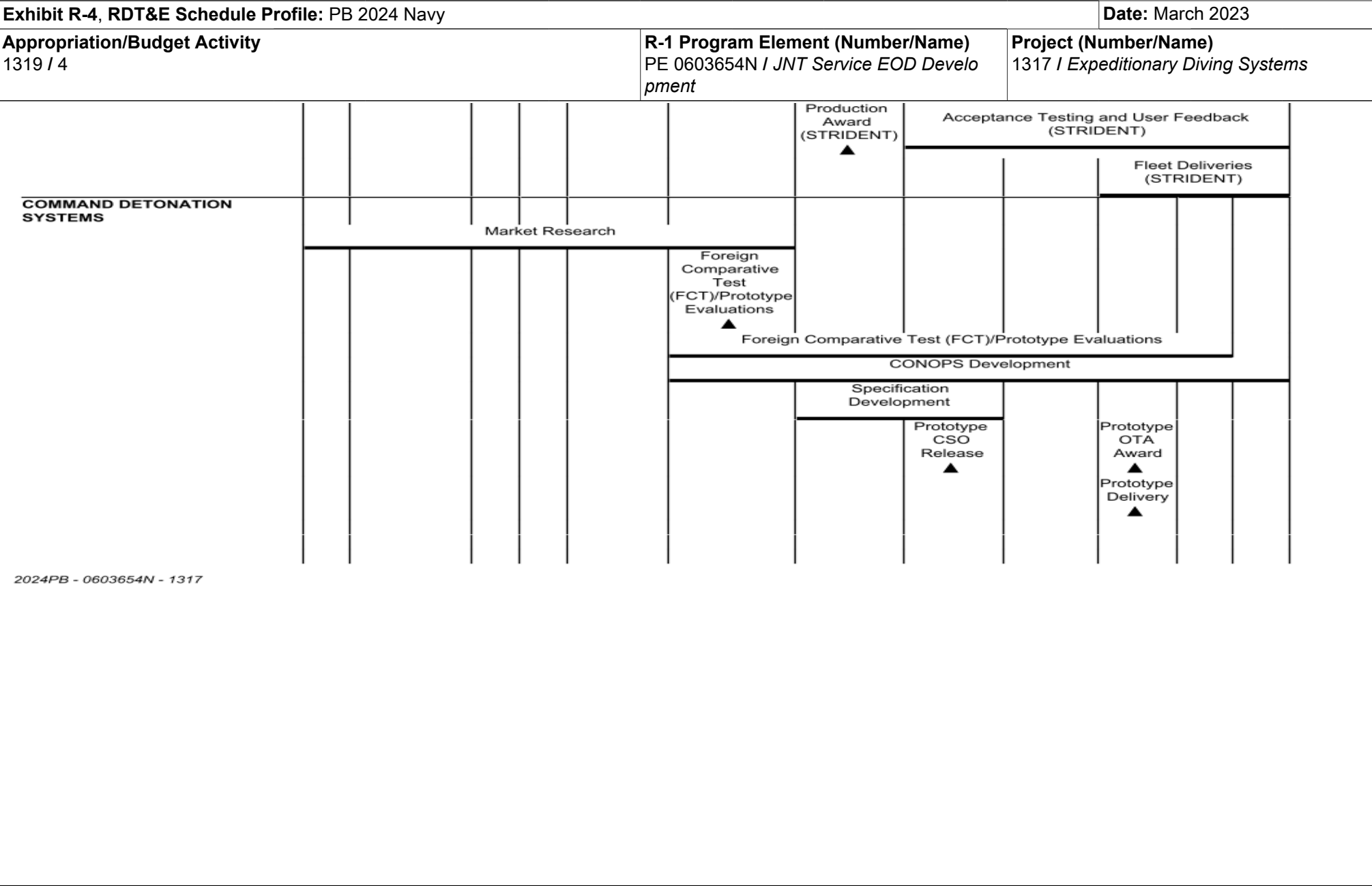
Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development				Project (Number/Name) 1317 / Expeditionary Diving Systems					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	Multiple Activities : Not Specified	46.624	0.200	Nov 2021	0.322	Nov 2022	0.370	Nov 2023	-		0.370	Continuing	Continuing	Continuing
Software Development	WR	Multiple Activites : Not Specified	7.156	0.100	Nov 2021	0.212	Nov 2022	0.276	Nov 2023	-		0.276	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWCIHEODTD : Indian Head, MD	8.328	0.080	Nov 2021	0.164	Nov 2022	0.193	Nov 2023	-		0.193	0.000	8.765	-
ILS	WR	Multiple Activities : Not Specified	11.916	0.000		0.000		0.000		-		0.000	0.000	11.916	-
Systems Engineering	WR	NSWC : Panama City	5.558	0.394	Nov 2021	0.537	Nov 2022	0.577	Nov 2023	-		0.577	Continuing	Continuing	Continuing
Systems Engineering	WR	NIWC : San Diego	7.305	0.395	Nov 2021	0.538	Nov 2022	0.588	Nov 2023	-		0.588	Continuing	Continuing	Continuing
Subtotal			86.887	1.169		1.773		2.004		-		2.004	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support2	C/CPFF	PERATON : Herndon VA	9.515	0.300	Nov 2021	0.441	Nov 2022	0.459	Nov 2023	-		0.459	Continuing	Continuing	Continuing
Subtotal			9.515	0.300		0.441		0.459		-		0.459	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	Multiple Activities : Not Specified	12.296	0.205	Nov 2021	1.406	Nov 2022	1.422	Nov 2023	-		1.422	Continuing	Continuing	Continuing
Subtotal			12.296	0.205		1.406		1.422		-		1.422	Continuing	Continuing	N/A
Remarks															
Additional funded added in FY23 to enable testing for failed MMUBA rigs.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development						Project (Number/Name) 1317 / Expeditionary Diving Systems			
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NSWCIHEODTD : Indian Head, MD	12.742	0.283	Nov 2021	0.412	Nov 2022	0.436	Nov 2023	-		0.436	0.000	13.873	-
Miscellaneous	WR	NSWC, Activities : Not Specified	7.005	0.000	Nov 2021	0.000		0.000		-		0.000	0.000	7.005	-
Acquisition Workforce Fund	Various	Various : Various	0.013	0.000		0.000		0.000		-		0.000	0.000	0.013	-
Subtotal			19.760	0.283		0.412		0.436		-		0.436	0.000	20.891	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			128.458	1.957		4.032		4.321		-		4.321	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development	Project (Number/Name) 1317 / Expeditionary Diving Systems	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 1317				
DIVER SAFETY LIFE SUPPORT (MMUBA): Prototyping MTA Phase	1	2022	3	2025
DIVER SAFETY LIFE SUPPORT (MMUBA): Prod. Rep. T&E Units	3	2023	3	2023
DIVER SAFETY LIFE SUPPORT (MMUBA): Limited Production Contract	4	2022	3	2025
DIVER SAFETY LIFE SUPPORT (MMUBA): Hydrospace Testing 2	3	2023	3	2023
DIVER SAFETY LIFE SUPPORT (MMUBA): Unmanned Testing	3	2023	3	2024
DIVER SAFETY LIFE SUPPORT (MMUBA): Environmental/Signature Assessment	4	2023	3	2024
DIVER SAFETY LIFE SUPPORT (MMUBA): Manned Testing	3	2024	3	2025
DIVER SAFETY LIFE SUPPORT (MMUBA): Logistics Assessment	1	2024	1	2024
DIVER SAFETY LIFE SUPPORT (MMUBA): Certification Dive	3	2025	3	2025
DIVER SAFETY LIFE SUPPORT (MMUBA): KP 2: Fielding Decision	3	2025	3	2025
DIVER SAFETY LIFE SUPPORT (MMUBA): Production MTA Phase	3	2025	4	2028
DIVER SAFETY LIFE SUPPORT (MMUBA): Receipt of Certification	3	2025	3	2025
DIVER SAFETY LIFE SUPPORT (MMUBA): Full Rate Production Option	3	2025	3	2025
DIVER SAFETY LIFE SUPPORT (MMUBA): First Article Delivery	2	2026	2	2026
DIVER SAFETY LIFE SUPPORT (MMUBA): Government Acceptance Testing (GAT)/ Factory Acceptance Testing (FAT)	2	2026	4	2028
DIVER SAFETY LIFE SUPPORT (MMUBA): IOC	3	2026	3	2026
DIVER SAFETY LIFE SUPPORT (MMUBA): Fleet Deliveries	3	2026	4	2028
DIVER SAFETY LIFE SUPPORT (MMUBA): Option Award #1	3	2026	3	2026
DIVER SAFETY LIFE SUPPORT (MMUBA): Option Award #2	3	2027	3	2027
DIVER SAFETY LIFE SUPPORT (MMUBA): Option Award #3	3	2028	3	2028

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development		Project (Number/Name) 1317 / Expeditionary Diving Systems	
	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
ADVANCED INTEGRATED DIVER SENSORS: Prototyping Phase (STRIDENT)	1	2022	2	2023
ADVANCED INTEGRATED DIVER SENSORS: DT&E (STRIDENT)	1	2022	3	2023
ADVANCED INTEGRATED DIVER SENSORS: FCA/SVR TIM (STRIDENT)	2	2022	2	2022
ADVANCED INTEGRATED DIVER SENSORS: Fleet Utility Assessment (FUA#1)/COTF Observation	2	2022	2	2022
ADVANCED INTEGRATED DIVER SENSORS: FUA #2 (STRIDENT)	1	2023	1	2023
ADVANCED INTEGRATED DIVER SENSORS: OTA Completions (STRIDENT)	1	2023	1	2023
ADVANCED INTEGRATED DIVER SENSORS: KP2: Production Decision/ECP Approval (STRIDENT)	2	2023	2	2023
ADVANCED INTEGRATED DIVER SENSORS: RFQ Release (STRIDENT)	2	2023	2	2023
ADVANCED INTEGRATED DIVER SENSORS: Supportability Review (STRIDENT)	3	2023	3	2023
ADVANCED INTEGRATED DIVER SENSORS: PCA (STRIDENT)	4	2023	4	2023
ADVANCED INTEGRATED DIVER SENSORS: Production & Fielding Phase (STRIDENT)	3	2023	4	2028
ADVANCED INTEGRATED DIVER SENSORS: Production Award (STRIDENT)	3	2023	3	2023
ADVANCED INTEGRATED DIVER SENSORS: Acceptance Testing and User Feedback (STRIDENT)	4	2023	4	2028
ADVANCED INTEGRATED DIVER SENSORS: Fleet Deliveries (STRIDENT)	2	2024	4	2028
ADVANCED INTEGRATED DIVER SENSORS: IOC (STRIDENT)	2	2025	2	2025
COMMAND DETONATION SYSTEMS: Market Research	1	2022	2	2023
COMMAND DETONATION SYSTEMS: CDD Approval - Remote Underwater Firing Initiation System (RUFIS)	2	2023	2	2023
COMMAND DETONATION SYSTEMS: Foreign Comparative Test (FCT)/Prototype Evaluations	2	2023	3	2024
COMMAND DETONATION SYSTEMS: CONOPS Development	2	2023	4	2028
COMMAND DETONATION SYSTEMS: Specification Development	3	2023	4	2023
COMMAND DETONATION SYSTEMS: Prototype CSO Release	4	2023	4	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603654N / JNT Service EOD Development

Project (Number/Name)

1317 / Expeditionary Diving Systems

	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
COMMAND DETONATION SYSTEMS: Prototype OTA Award	2	2024	2	2024
COMMAND DETONATION SYSTEMS: Prototype Delivery	2	2024	2	2024
COMMAND DETONATION SYSTEMS: DT&E (including low-mu & environmental)	1	2025	2	2028
COMMAND DETONATION SYSTEMS: OT&E	1	2028	2	2028
COMMAND DETONATION SYSTEMS: WSESRB Review	3	2025	4	2027
COMMAND DETONATION SYSTEMS: Production Decision	1	2028	1	2028
COMMAND DETONATION SYSTEMS: First Article Delivery	3	2028	3	2028
COMMAND DETONATION SYSTEMS: Fleet Deliveries	4	2028	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development				Project (Number/Name) 3177 / Joint Counter Radio-Controlled IED Elec Warfare			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3177: Joint Counter Radio-Controlled IED Elec Warfare	121.780	14.715	10.869	9.510	-	9.510	7.315	7.386	7.468	7.245	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Funding for the DRAKE Counter Unmanned Aircraft Systems (CUAS) moved to PE 0604636N/Project 2073 beginning in FY23.

A. Mission Description and Budget Item Justification

This project supports the defense objective of preventing terrorist and near peer operations against the US, allies, and partners. It provides for the research and development of Electronic Warfare (EW) systems, equipment, procedures, and tactical aids for all military services to counter the threat posed by Radio-Controlled Improvised Explosive Devices (RCIEDs) and to prevent initiation of RCIEDs across the spectrum of Joint military operations. It utilizes Joint requirements to provide a system of systems approach for a suite of equipment for mounted, dismounted, and fixed site operations, and develops equipment, procedures, and tactical aids to make rapid improvements to performance, supportability and affordability, while maintaining pace with the evolving global RCIED threat.

Joint Counter RCIED electronic Warfare (JCREW), Increment 1 Block 1 (I1B1) is the next generation of counter RCIED system of systems. JCREW includes fixed site, mounted and dismounted units, which provide countermeasures against the global RCIED threat. Key system design features include significant performance increases over current legacy systems, a modular open architecture system design to facilitate improvements to address current and future advanced threats, robust information assurance and security, and is net-capable for improved Communications and Control (C2). JCREW I1B1 supports global deployment and sustainment for all combatant commands providing increased protection to Warfighter against the evolving worldwide RCIED threats. This project also provides for the research, development, and systems engineering of related CREW systems, providing capability improvements to fielded systems based on ever-changing RCIED threats against EOD technicians. And it provides for research, development, and systems engineering of electronic forensic capabilities related to the technical exploitation of asymmetric threats, including RCIEDs, unmanned systems, and underwater mines. The information generated is used to increase the performance of CREW and other counter-IED systems, as well as enable development of new countermeasure capabilities.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Joint Counter Radio-Controlled IED Elec Warfare	13.462	10.403	9.030	0.000	9.030
Articles:	-	-	-	-	-
Description: Supports the development, integration and test of Technology Insertion hardware, software, and advanced techniques into JCREW systems. Technology Insertion candidates include Office of Naval Research (ONR) sponsored technologies ready for transition to JCREW including the ENabling Dynamic Operational RF (ENDOR) Future Naval Capability (FNC); and techniques, hardware and software performance improvements					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development		Project (Number/Name) 3177 / Joint Counter Radio-Controlled IED Elec Warfare		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
developed by United States Government (USG) laboratories, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and the JCREW prime contractor. Analysis of Alternatives (AoA) will be conducted to evaluate and select Tech Insertion candidates based on technical maturity, cost, and performance. Hardware and software updates will be integrated, tested, and implemented into CREW systems through Engineering Change Proposals (ECPs).						
Develop CREW load sets to remain current with continually changing CONUS and OCONUS threats. Develop hardware and software capabilities to enable enhanced cyber and electronics forensics and exploitation of evolving RCIED threats.						
FY 2023 Plans: Complete technology insertion package 3 efforts, including integration of the control display unit phase 4 software and advanced techniques Quattro Inc 2 and Starfish Inc 0 in OP 7.6. Continue technology insertion package 4 efforts, including build and test of the NextGen SDR production validation systems and development of several advanced techniques for dismounted and mounted JCREW I1B1 systems to stay current with CONUS and OCONUS threats. Transition the Office of Naval Research Future Naval Capability Electronic Warfare Operating Kit (EWOK) to PMS408 and begin integration with the NextGen SDR software. Continue to provide systems engineering for JCREW Technology Insertion.						
FY 2024 Base Plans: Complete technology insertion package 4 development and test. Perform technology insertion package 5 analysis of alternatives and begin development. Continue to develop, integrate, test, field hardware / software upgrades and advanced techniques for JCREW systems in support of technology insertion and technology refresh efforts to address evolving JCREW threats.						
FY 2024 OCO Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development		Project (Number/Name) 3177 / Joint Counter Radio-Controlled IED Elec Warfare		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: Decrease of \$1.373M from FY2023 to FY2024 due to reduction of JCREW communications interoperability and jamming techniques development requirements.						
Title: EOD CREW Articles: FY 2023 Plans: Provide systems engineering support for EOD CREW systems. Develop and validate AN/PLT-4A replacement requirements. FY 2024 Base Plans: Provide systems engineering support for EOD CREW systems. Continue to refine and validate AN/PLT-4A requirements and support Army testing and evaluation efforts. Collaborate with US Army to perform testing and evaluation on AN/PLT-4A prototype. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: N/A		0.442 -	0.466 -	0.480 -	0.000 -	0.480 -
Title: HEMLOCK Articles: FY 2023 Plans: N/A FY 2024 Base Plans: N/A FY 2024 OCO Plans: N/A		0.811 -	0.000 -	0.000 -	0.000 -	0.000 -
Accomplishments/Planned Programs Subtotals		14.715	10.869	9.510	0.000	9.510

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development	Project (Number/Name) 3177 / Joint Counter Radio-Controlled IED Elec Warfare	

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• OPN/5509(b): Explosive Ordnance Disposal Equip	0.894	20.912	20.931	-	20.931	0.950	0.000	0.000	0.000	0.000	206.567

Remarks

D. Acquisition Strategy

Develop, integrate, test, and field hardware and software upgrades, and advanced techniques in JCREW systems through the JCREW Technology Insertion and Technology Refresh process. Technology insertion candidates include the Office of Naval Research (ONR) the ENabling Dynamic Operational RF (ENDOR) Future Naval Capability (FNC); and techniques, hardware and software performance improvements developed by United States Government (USG) laboratories, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and the JCREW prime contractor. Analysis of Alternatives (AoA) will be conducted to evaluate and select Tech Insertion candidates based on technical maturity, cost, and performance. Hardware and software updates will be integrated, tested, and implemented in JCREW via Engineering Change Proposals (ECPs).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development					Project (Number/Name) 3177 / Joint Counter Radio-Controlled IED Elec Warfare				
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/FFP	Northrop Grumman / : San Diego, CA	22.448	2.749	Jan 2022	2.246	Jan 2023	2.062	Jan 2024	-		2.062	Continuing	Continuing	Continuing
Systems Engineering	C/FFP	Northrop Grumman : San Diego, CA	12.707	1.370	Jan 2022	1.394	Jan 2023	1.036	Jan 2024	-		1.036	Continuing	Continuing	Continuing
Software Development	C/FFP	Northrop Grumman : San Diego, CA	13.940	1.670	Jan 2022	1.489	Jan 2023	1.120	Jan 2024	-		1.120	Continuing	Continuing	Continuing
System Integration	C/FFP	Northrop Grumman : San Diego, CA	8.334	1.227	Jan 2022	0.963	Jan 2023	0.768	Jan 2024	-		0.768	Continuing	Continuing	Continuing
Subtotal			57.429	7.016		6.092		4.986		-		4.986	Continuing	Continuing	N/A
Remarks															
FY23 to FY24 decrease due to removal of CUAS product development into a new budget line.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Loadset Development	FFRDC	JHU/APL : Laurel, MD	9.921	1.134	Nov 2021	0.792	Nov 2022	0.740	Nov 2023	-		0.740	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC : Various	24.035	2.674	Nov 2021	1.804	Nov 2022	1.632	Nov 2023	-		1.632	Continuing	Continuing	Continuing
Program Management Support	WR	IHEODTD : Indian Head, MD	3.474	0.475	Nov 2021	0.301	Nov 2022	0.290	Nov 2023	-		0.290	Continuing	Continuing	Continuing
Subtotal			37.430	4.283		2.897		2.662		-		2.662	Continuing	Continuing	N/A
Remarks															
FY23 to FY24 decrease due to termination of Hemlock Program.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development						Project (Number/Name) 3177 / Joint Counter Radio-Controlled IED Elec Warfare			
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NSWC : Various	12.676	1.741	Nov 2021	1.880	Nov 2022	1.862	Nov 2023	-		1.862	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	MIPR	YPG : Yuma, Arizona	9.971	0.990	Nov 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			22.647	2.731		1.880		1.862		-		1.862	Continuing	Continuing	N/A
Remarks FY23 to FY24 decrease due to reduction of JCREW communications interoperability and jamming techniques development requirements.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	Cydecor : Various	1.795	0.286	Nov 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Miscellaneous	WR	NSWC : Various	2.479	0.399	Nov 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			4.274	0.685		0.000		0.000		-		0.000	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			121.780	14.715		10.869		9.510		-		9.510	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603654N / JNT Service EOD Development

Project (Number/Name)

3177 / Joint Counter Radio-Controlled IED Elec Warfare

FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Proj 3177

JCREW I1B1: Full Rate Production																												
JCREW I1B1: TECH INSERTION 3																												
JCREW I1B1: Tech Refresh Development (3)																												
JCREW I1B1: Tech Refresh Implementation and Test (3)																												
JCREW I1B1: TECH INSERTION 4																												
JCREW I1B1: Tech Refresh Analysis of Alternatives (4)																												
JCREW I1B1: Tech Refresh Development (4)																												
JCREW I1B1: Tech Refresh Implementation and Test (4)																												
JCREW I1B1: TECH INSERTION 5																												
JCREW I1B1: Tech Refresh Analysis of Alternatives (5)																												
JCREW I1B1: Tech Refresh Development (5)																												
JCREW I1B1: Tech Refresh Implementation and Test (5)																												
JCREW I1B1: TECH INSERTION 6																												
JCREW I1B1: Tech Refresh Analysis of Alternatives (6)																												
JCREW I1B1: Tech Refresh Development (6)																												
JCREW I1B1: Tech Refresh Implementation and Test (6)																												
JCREW I1B1: Counter Unmanned Aerial System Development																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																				Date: March 2023								
Appropriation/Budget Activity 1319 / 4										R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development								Project (Number/Name) 3177 / Joint Counter Radio-Controlled IED Elec Warfare										
	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
JCREW I1B1: C-UAS Improvement Program																												
EOD CREW: EOD CREW Development																												
EOD CREW: AN/PLT 4 Replacement Development																												
EOD CREW: Hemlock Hardware/Software Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603654N / JNT Service EOD Development

Project (Number/Name)

3177 / Joint Counter Radio-Controlled IED Elec Warfare

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3177				
JCREW I1B1: Full Rate Production	1	2022	4	2024
JCREW I1B1: TECH INSERTION 3	1	2022	2	2023
JCREW I1B1: Tech Refresh Development (3)	1	2022	2	2023
JCREW I1B1: Tech Refresh Implementation and Test (3)	2	2023	2	2023
JCREW I1B1: TECH INSERTION 4	2	2022	4	2024
JCREW I1B1: Tech Refresh Analysis of Alternatives (4)	1	2022	1	2022
JCREW I1B1: Tech Refresh Development (4)	2	2022	4	2024
JCREW I1B1: Tech Refresh Implementation and Test (4)	4	2024	4	2024
JCREW I1B1: TECH INSERTION 5	1	2024	2	2026
JCREW I1B1: Tech Refresh Analysis of Alternatives (5)	1	2024	3	2024
JCREW I1B1: Tech Refresh Development (5)	4	2024	2	2026
JCREW I1B1: Tech Refresh Implementation and Test (5)	2	2026	2	2026
JCREW I1B1: TECH INSERTION 6	3	2026	2	2028
JCREW I1B1: Tech Refresh Analysis of Alternatives (6)	3	2026	1	2027
JCREW I1B1: Tech Refresh Development (6)	3	2026	2	2028
JCREW I1B1: Tech Refresh Implementation and Test (6)	2	2028	2	2028
JCREW I1B1: Counter Unmanned Aerial System Development	1	2022	4	2022
JCREW I1B1: C-UAS Improvement Program	4	2022	4	2022
EOD CREW: EOD CREW Development	1	2022	4	2024
EOD CREW: AN/PLT 4 Replacement Development	1	2022	4	2024
EOD CREW: Hemlock Hardware/Software Development	1	2022	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development				Project (Number/Name) 3447 / Mine Expeditionary Response Vehicle (MESR)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3447: Mine Expeditionary Response Vehicle (MESR)	0.000	8.693	11.066	18.676	-	18.676	12.558	10.168	10.376	10.548	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

MESR realigned from Project 4023 beginning in FY22

A. Mission Description and Budget Item Justification

Funding supports the development of unmanned systems for the Navy's expeditionary unmanned underwater Explosive Ordnance Disposal (EOD) and Mine Countermeasures (MCM) capability. Specifically, it provides for development of affordable expeditionary remote stand-off underwater systems to support Navy Expeditionary forces including EOD, Mobile Diving and Salvage, Underwater Construction Teams (UCT), and Expeditionary Mine Countermeasures (ExMCM) mission operations. The equipment must be highly portable in order to support the Navy EOD technician to safely detect, approach, render safe, recover, exploit, and dispose of underwater explosive threats to include sea mines, limpet mines, maritime IEDs, and unexploded ordnance. Provides support for the Navy's high priority missions of Maritime Homeland Defense and MCM. This project directly supports Department of the Navy Strategic Roadmap for Unmanned Systems promulgated in March 2018 and addresses capability gaps defined by the Joint Service EOD (JSEOD) Initial Capabilities Document (ICD), Serial Number 671-75-05 of 3 June 2005, Joint Improvised Explosive Device (IED) Defeat Initial Capabilities Document (ICD) of 23 February 2006/JROCM 070-06, and the Expeditionary MCM ICD of June 2017. This project is being executed in accordance with approved CNO N9I Requirement #056-95-19, "Capability Development Document (CDD) for Maritime Expeditionary Standoff Response Family of Systems (MESR)," July 23, 2019.

Additional efforts continue to execute the open competition process necessary to acquire and verify an EOD Response ROV capability focusing on user effectiveness and operational suitability to provide a ROV based target interdiction capability to address the capability gaps assessed in the previously conducted Expeditionary UUV Neutralization System (EUNS) AoA. This next generation capability is developed to decrease risk when reacquiring/investigating a potential threat (i.e. sea mine or maritime IED). In response to emergent maritime threat assessments ISO of INDOPAC Global Power Competition (GPC) scenarios, the MESR Program of Record (PoR) will initiate and conduct a Proof-of-Concept effort to demonstrate the potential ability to counter deep-water explosive threats as an ExMCM enabling capability ISO Joint Force Maneuver.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: EOD Response ROVs and Maritime Expeditionary Standoff Response System of Systems	8.693	11.066	18.676	0.000	18.676
Articles:	-	-	-	-	-
Description: This program supports development, testing and evaluation of technologies and commercial systems that will provide needed capabilities to EOD and Expeditionary forces in responding to the wide range					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development	Project (Number/Name) 3447 / Mine Expeditionary Response Vehicle (MESR)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO
<p>of underwater threats and operational environments encountered in assigned mission areas to include: confined areas, hulls, piers and pilings to detect, search, classify, map, re-acquire, identify, and neutralize sea and limpet mines and underwater improvised explosive devices.</p> <p>FY 2023 Plans: FY23 efforts will focus on completion of the platform and payload integration testing leading to the Critical Design Review (CDR). Following a successful CDR, full system test and evaluation will be conducted to demonstrate complete compliance with the MESR Increment I CDD KPP thresholds and system performance specification requirements. Environmental testing will also be conducted in FY23 to verify ability to withstand the operational and physical environments in which the system will be employed. Additional efforts in FY23 will continue with DIU cooperative autonomy projects and ensuring system design considers cybersecurity compliance and achieving final Weapon System Explosive Safety Review Board (WSESRB) concurrence.</p> <p>FY 2024 Base Plans: FY24 efforts will focus on completing the events and actions necessary to achieve a production decision for MESR Increment I. Following a successful decision, award of the initial production lot will occur, followed by delivery and acceptance testing of the first lot of production units. Additionally, based on the results of the Alternative Systems Review (ASR) conducted in FY22 and the acquisition of initial Increment II payloads in FY23, developmental testing and evaluation of candidate payloads for integration into prototype Increment II platforms will continue in FY24. The Deep Water Threat Response effort will initiate in FY24 including CONOPS development, platform hardening, and component analysis and selection.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Funding increase from FY2023 required to develop expeditionary capabilities for semi-autonomous deep water naval mine reacquisition, localization and neutralization. FY24 funding will help close the deep water capability gap and increase explosive standoff and reduces operational risk during execution of mine and IED detection, localization, and neutralization missions. In addition to initial design and testing, required funding will procure depth-hardened ROVs and actuation prototypes.</p>					
Accomplishments/Planned Programs Subtotals		8.693	11.066	18.676	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy									Date: March 2023			
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development				Project (Number/Name) 3447 / Mine Expeditionary Response Vehicle (MESR)				
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
• OPN/0977: UNDERWATER EOD EQUIPMENT	24.146	35.417	19.549	-	19.549	16.778	23.861	24.221	24.789	Continuing	Continuing	
Remarks												
BLI 0977 funding covers several EOD program efforts to include, ROVs, STRIDENT, Command Detonation Systems,and MESR.												
D. Acquisition Strategy												
Analysis of Alternatives (AOA) studies and/or Alternative System Reviews (ASRs) are conducted prior to the initiation of new sub-projects. The AOA addresses and emphasizes acquisitions strategies of the most cost effective solution over the sub-projects' life-cycle. The acquisition strategies observe the following hierarchy of alternatives: commercial item (including modifications), non-developmental item (including modifications), and lastly, developmental programs. Contracting for RDT&E, if required, is competitive and when feasible, production options are included. This ongoing program capitalizes on a User Operational Evaluation System (UOES) effort involving Fleet operators engaged in tactical experimentation with prototype EOD Response vehicles prior to fielding baseline systems and capability improvement package increments. Operational capabilities with ROVs have been realized at designated operational units, using a competitive, innovative acquisition strategy. The addition of enhanced capabilities through an evolutionary acquisition approach to the EOD Response toolbox is programmed for delivery in accordance with approved CNO requirements and ONR Technology Deployment Agreements (TDAs) which close capability gaps. Further improvements to the toolbox to add basic mine and underwater explosive threats neutralization capabilities will continue to be pursued, including expansion of EOD Response capabilities employing Remotely Operated Vehicles (ROVs) in areas where current UUVs cannot operate. Streamlined acquisition initiatives are in place to quickly evaluate candidate EOD response capabilities while the longer term MESR Family of Systems is developed. A key attribute for these systems is minefield suitability and control of system signatures to counter influence fired ordnance. Influence signatures of subject ROVs will be characterized as a vital component of the acquisition initiatives. Maximum use of innovative contracting mechanisms will be assessed and pursued where applicable and in the best interest of the Navy.												

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development				Project (Number/Name) 3447 / Mine Expeditionary Response Vehicle (MESR)					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	Various : Various	0.000	1.228	Nov 2021	1.364	Nov 2022	3.298	Nov 2023	-		3.298	Continuing	Continuing	Continuing
System Engineering	WR	Various : Various	0.000	2.727	Nov 2021	3.920	Nov 2022	5.486	Nov 2023	-		5.486	Continuing	Continuing	Continuing
Subtotal			0.000	3.955		5.284		8.784		-		8.784	Continuing	Continuing	N/A
Remarks															
Increased funding in FY24 will enable procurement of hardware and software necessary for depth-hardened ROVs and actuation prototype.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Support	C/CPFF	PERATON : Herndon, VA	0.000	0.450	Nov 2021	0.564	Nov 2022	1.014	Nov 2023	-		1.014	Continuing	Continuing	Continuing
Subtotal			0.000	0.450		0.564		1.014		-		1.014	Continuing	Continuing	N/A
Remarks															
Increased funding in FY24 will enable support of power analysis, onboard autonomy, navigation, communication and influence characterization of depth-hardened ROVs and actuation.															
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	VARIOUS : Various	0.000	4.288	Nov 2021	5.218	Nov 2022	8.878	Nov 2023	-		8.878	Continuing	Continuing	Continuing
Subtotal			0.000	4.288		5.218		8.878		-		8.878	Continuing	Continuing	N/A
Remarks															
Increased funding will enable the test and evaluation of power analysis, onboard autonomy, navigation, communication and influence characterization of depth-hardened ROVs and actuation prototypes.															

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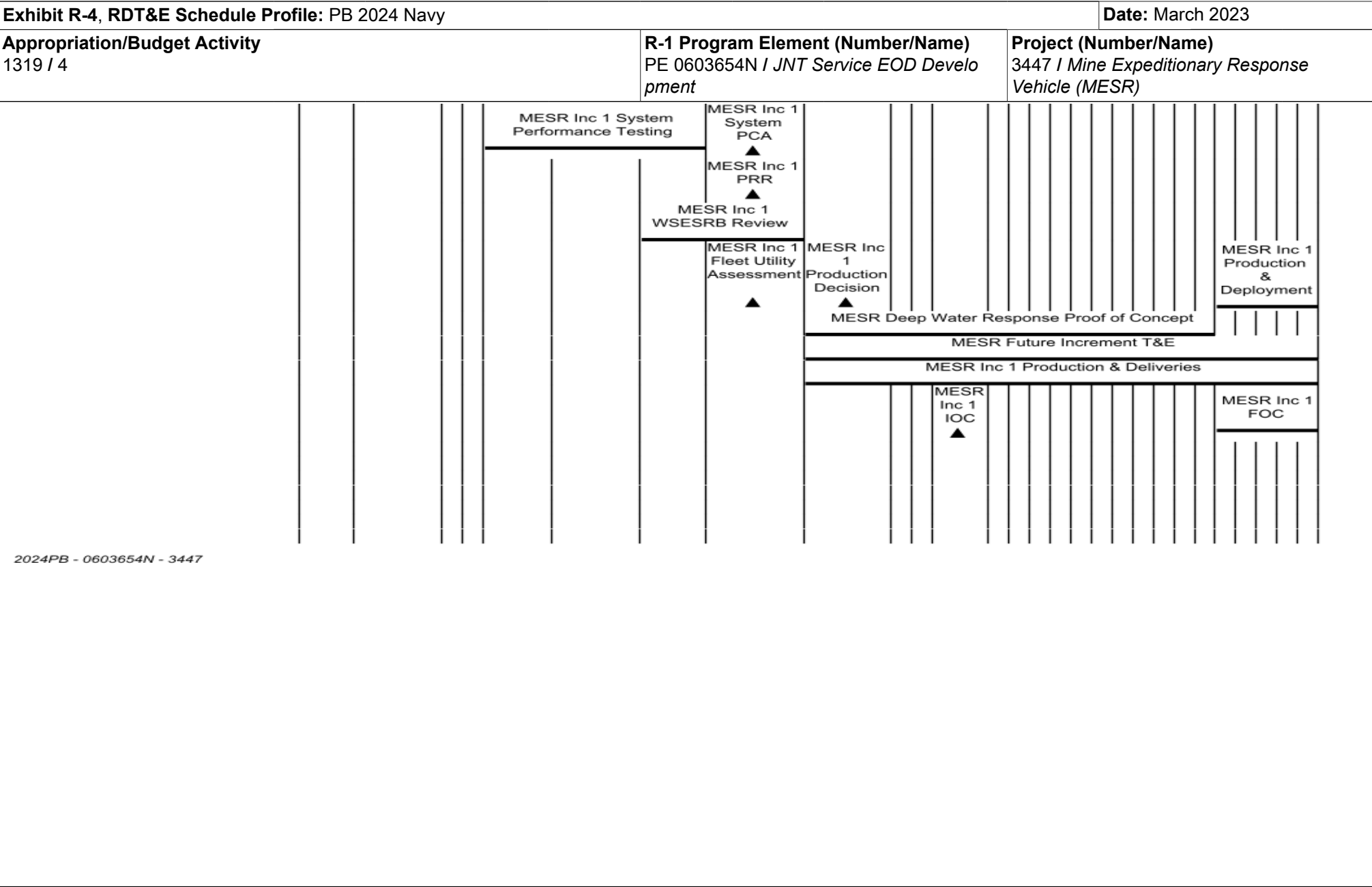
Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023				
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development					Project (Number/Name) 3447 / Mine Expeditionary Response Vehicle (MESR)					
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	8.693		11.066		18.676		-		18.676	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy												Date: March 2023																																			
Appropriation/Budget Activity 1319 / 4												R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development												Project (Number/Name) 3447 / Mine Expeditionary Response Vehicle (MESR)																							
Proj 3447												FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028											
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems												1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q								
												MOTS ROV Fleet Deliveries																																			
												MOTS ROV EOD Extended UOES																																			
												MOTS ROV EOD Response Production OT Lot #1 ▲								MOTS ROV EOD Response Production OT Lot #2 ▲								MOTS ROV EOD Transition to MESR Inc I ▲																			
												MESR Inc 1 ONR LO/NCD FNC																																			
												MESR Inc 1 Platform and Payload Integration Testing																																			
												MESR Inc 1 EMD Phase																																			
MESR Inc 1 PDR TIM ▲												MESR Inc 1 Alternative Systems Review																																			
												MESR Inc 1 Environmental Testing																																			
																				MESR Inc 2 Initiation ▲																											
																MESR Inc 1 SVR ▲				MESR Deep Water Response Planning																											
																MESR Inc 1 CDR TIM ▲																															
																MESR Inc 1 Platform PCA ▲																															

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development	Project (Number/Name) 3447 / Mine Expeditionary Response Vehicle (MESR)	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3447				
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MOTS ROV Fleet Deliveries	1	2022	4	2024
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MOTS ROV EOD Extended UOES	1	2022	1	2024
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MOTS ROV EOD Response Production OT Lot #1	2	2022	2	2022
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MOTS ROV EOD Response Production OT Lot #2	2	2023	2	2023
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MOTS ROV EOD Transition to MESR Inc I	1	2024	1	2024
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Inc 1 ONR LO/NCD FNC	1	2022	2	2024
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Inc 1 Platform and Payload Integration Testing	1	2022	2	2023
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Inc 1 EMD Phase	1	2022	4	2023
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Inc 1 PDR TIM	1	2022	1	2022
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Inc 1 Alternative Systems Review	2	2022	3	2023
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Inc 1 Environmental Testing	2	2022	3	2023
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Inc 2 Initiation	3	2023	3	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development	Project (Number/Name) 3447 / Mine Expeditionary Response Vehicle (MESR)		
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Deep Water Response Planning		3	2023	4	2023
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Inc 1 SVR		1	2023	1	2023
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Inc 1 CDR TIM		1	2023	1	2023
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Inc 1 Platform PCA		1	2023	1	2023
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Inc 1 System Performance Testing		1	2023	3	2023
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Inc 1 System PCA		4	2023	4	2023
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Inc 1 PRR		4	2023	4	2023
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Inc 1 WSESRB Review		3	2023	4	2023
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Inc 1 Fleet Utility Assessment		4	2023	4	2023
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Inc 1 Production Decision		1	2024	1	2024
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Inc 1 Production & Deployment		4	2027	4	2028
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Deep Water Response Proof of Concept		1	2024	3	2027
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Future Increment T&E		1	2024	4	2028
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Inc 1 Production & Deliveries		1	2024	4	2028

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603654N / JNT Service EOD Development		Project (Number/Name) 3447 / Mine Expeditionary Response Vehicle (MESR)	
	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Inc 1 IOC	4	2024	4	2024
EOD Response ROVs and Maritime Expeditionary Standoff Response Family of Systems: MESR Inc 1 FOC	4	2027	4	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603713N / Ocean Engineering Tech Dev							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	82.450	8.547	6.193	10.751	-	10.751	16.961	10.528	9.446	8.810	Continuing	Continuing
0099: Deep Submergence Bio Med Dev	49.227	4.354	3.082	2.433	-	2.433	3.746	3.454	3.348	3.415	Continuing	Continuing
0394: Shallow Depth Diving EQ	33.223	4.193	3.111	8.318	-	8.318	13.215	7.074	6.098	5.395	Continuing	Continuing

A. Mission Description and Budget Item Justification

Developments in this program will enable the U.S. Navy to overcome deficiencies that constrain manned diving operations in several critical areas such as submarine rescue, recovery, salvage, underwater ship husbandry, underwater construction and naval special operations. This program develops biomedical technology, diver life support equipment, and the systems, tools, and procedures to permit manned underwater operations and enhance diver performance and safety.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	8.774	6.193	6.442	-	6.442
Current President's Budget	8.547	6.193	10.751	-	10.751
Total Adjustments	-0.227	0.000	4.309	-	4.309
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.227	0.000			
• Program Adjustments	0.000	0.000	4.261	-	4.261
• Rate/Misc Adjustments	0.000	0.000	0.048	-	0.048

Change Summary Explanation

The FY22 reduction of \$0.227M is the final SBIR assessment. FY24 increase of \$4.309M is to fund the Submarine Rescue System Modernization Program. Increase is required by the Navy in order to provide a credible U.S. Submarine Rescue System (SRS) for our sailors and ally partner nations. As part of detailed review, Navy determined the system had not been funded sufficiently to properly modernize the system and FY24 budget increase is to support this. The modernization of SRS is required to address known reliability and obsolescence issues and support the planned minimum 15 year system service life extension prior to SRS's end of life and inoperability.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603713N / Ocean Engineering Tech Dev				Project (Number/Name) 0099 / Deep Submergence Bio Med Dev			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0099: Deep Submergence Bio Med Dev	49.227	4.354	3.082	2.433	-	2.433	3.746	3.454	3.348	3.415	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project:

- 1) Develops advanced biomedical and bioengineering technology for medical and life support enhancement to decrease submariner deaths and permanent injury in a disabled submarine (DISSUB) and during submarine escape and rescue;
- 2) Conducts research for diver health, safety, and effectiveness to increase understanding of human performance and enhanced diver stress management and survivability in high stress environments such as in cold/warm water and at altitude. This project also validates and improves the accuracy of assumptions associated with equipment testing and certification, diving procedures, and diver biomedical physiology.

Deliverables for DISSUB include: medical guidance/procedures increasing submariner survivability for submarine escape and rescue (including new Submarine Rescue Diving and Recompression System (SRDRS)), life support parameters, medical procedures for life support; exposure and mitigation guidance for atmospheric contaminants, high levels of oxygen and/or carbon dioxide; prevention and treatment of decompression sickness and pulmonary oxygen toxicity; and senior survivor expert decision system.

Deliverables for diver health and safety include: decompression guidance in extreme environment diving with various breathing mixtures, temperatures, durations, and altitudes; exposure guidance for oxygen breathing; diver performance guidance based on physiological effects of diving; enhanced underwater swimming efficiency; enhanced diver thermal protection; collection of operational diving depth/time profiles to predict decompression risk, and exposure and mitigation guidance for divers experiencing underwater continuous noise, impulse noise, or underwater blast.

Requirements:

OPNAVINST 3150.27D, Navy Diving Policy and Joint Military Diving Technology and Training Program, 01 Mar 2021

Navy Salvage and Navy Diving Capabilities-Based Assessment (CBA) Report, 19 Dec 2013

NAPDD #587-873, Deep Submergence Biomedical Development, 23 Nov 1999

NAVSEA Instruction 3900.10A, Management of the Deep Submergence Biomedical Research and Development Program, 6 Nov 2018

Navy Diving Initial Capabilities Document (ICD)

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Deep Submergence Bio Med Dev - Diver Health and Safety	2.958	1.744	1.055	0.000	1.055
Articles:	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603713N / Ocean Engineering Tech Dev		Project (Number/Name) 0099 / Deep Submergence Bio Med Dev		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Description: Diver Health and Safety Research: Novel methods for decompression safety and treatment of decompression sickness/arterial gas embolism. Advanced decompression models for extreme environments, including thermally challenging, long duration, multi-gas, and/or diving at altitude. Diving physiology advances in exercise, thermal exposure, oxygen/carbon dioxide alterations, other gas mixture alternations, hydration, and sustained operations. Develop pulmonary oxygen toxicity exposure limits. Provide pulmonary and Central Nervous System (CNS) oxygen toxicity mitigation strategies. Develop an advanced diver thermal model. Develop advanced insulation garments for diver thermal protection. Develop guidance for optimizing thermal control during decompression. Develop guidelines for conduct of diving operations at altitude. Develop guidance for infra- and ultra-sound diver exposure. Continue collection of operational and research dive data for inclusion in advanced probabilistic decompression models. Investigate diver in-water maladies. Develop/improve real-time decompression guidance and dive planning. Research procedures for assessing and mitigating risk for diving in contaminated water.</p> <p>FY 2023 Plans:</p> <p>*Multi-Year Project Support: Completion of projects initiated in prior fiscal years will be supported where progress is deemed acceptable and project goals remain valid and attainable.</p> <p>*Diver Hearing Conservation: Continue work to quantify acoustic exposures to divers and thus support hearing loss risk mitigation. Develop an underwater noise dosimeter for determining real-time diver noise/blast exposure.</p> <p>*Central Nervous System (CNS) O2 Toxicity Mitigation: Continue to evaluate ketone ester supplement in prevention of CNS O2 Toxicity.</p> <p>*Swimming Induced Pulmonary Edema (SIPE): Continue to evaluate SIPE in NSW candidates to characterize the disease, mitigation strategies and screening tools for at risk personnel.</p> <p>*Surface-supplied helium-oxygen decompression table modernization: Continue to validate, via manned diving, a new probabilistic surface-supplied helium-oxygen decompression table derived from new modeling techniques that addresses critical gaps in current tables to improve diver safety and operational efficiency.</p> <p>*Decompression Sickness (DCS) models to allow for real-time optimization of dive profiles: Continue to use new computer technology and techniques to accelerate, optimize and evaluate DCS models to support this effort.</p>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603713N / Ocean Engineering Tech Dev		Project (Number/Name) 0099 / Deep Submergence Bio Med Dev	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>*Continue evaluation of a new approach to decompression in an animal model by breathing a different gas (perfluoromethane, CF4) from the one used during the dive to reduce decompression time and enhance safety.</p> <p>*Evaluate the effects of respiratory muscle training on carbon dioxide retention.</p> <p>FY 2024 Base Plans:</p> <p>*Multi-Year Project Support: Completion of projects initiated in prior fiscal years will be supported where progress is deemed acceptable and project goals remain valid and attainable.</p> <p>*Diver Hearing Conservation: Continue underwater noise dosimeter development for determining real-time diver noise/blast exposure.</p> <p>*Central Nervous System (CNS) O2 Toxicity Mitigation: Continue to evaluate ketone ester supplement in prevention of CNS O2 Toxicity.</p> <p>*Swimming Induced Pulmonary Edema (SIPE): Continue to evaluate SIPE in NSW candidates to characterize the disease, mitigation strategies and screening tools for at risk personnel.</p> <p>*Continue evaluation of the effects of respiratory muscle training on carbon dioxide retention.</p> <p>FY 2024 OCO Plans:</p> <p>N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p> <p>Decrease of -0.689M from FY 2023 to FY 2024 will eliminate funding for two (2) contaminated water diving studies on diver thermal protection and diving guidance methods.</p>					
Title: Deep Submergence Bio Med Dev - Submarine Escape & Rescue		1.396	1.338	1.378	0.000
Articles:		-	-	-	-
Description: Submarine Rescue/Escape Research: Provide decompression procedures for pressurized Submarine Rescue Diving and Recompression System (SRDRS) operators. Investigate adjunctive therapies for treating Disabled Submarine (DISSUB) survivors. Provide updated guidance for food, water, clothing, medical supplies, to enhance survival of submarine crews awaiting rescue. Develop/provide flexible computer-generated decompression schedules for wide range of conditions in a DISSUB. Develop DISSUB medical triage					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023					
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603713N / Ocean Engineering Tech Dev		Project (Number/Name) 0099 / Deep Submergence Bio Med Dev				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)				FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>procedures and support DISSUB survival trials. Develop mitigation strategies to reduce hyperbaric oxygen exposures in closed vehicles/compartments. Develop treatment guidance for decompression sickness and arterial gas embolism in submarine escape and rescue. Investigate the use of novel pharmacologic agents to reduce decompression risk and/or oxygen toxicity in submarine rescues. Develop/deploy toxic gas analyzer for use in pressurized DISSUB rescue. Investigate interventions for toxicological problems in DISSUB survivors. Develop strategies to minimize decompression sickness and arterial gas embolism with Submarine Escape and Surface Survival Personnel Equipment (SESSPE) training.</p> <p>FY 2023 Plans:</p> <p>*Multi-Year Project Support: Completion of projects initiated in prior fiscal years will be supported where progress is deemed acceptable and project goals remain valid and attainable.</p> <p>*Assess Impact of CO2 on Pressurized DISSUB survival: Continue animal research to answer the question regarding whether elevated CO2 levels will accelerate onset of Pulmonary O2 Toxicity and increase mortality during high internal pressure DISSUB scenarios.</p> <p>*Continue Independent Validation & Verification (IV&V) of the USN Submarine Rescue System (SRS) Decompression App to validate tool as rapid, real-time tracker and reference guide for use in a DISSUB rescue compliment the SRS Planner manual.</p> <p>* Evaluation of Guard Book Calculation Methods: Continue recommendations for how those errors can be eliminated through procedural changes or edits to the existing format(s).</p> <p>*Manned Testing of Specialized Surface Decompression procedures for DISSUB rescue without transfer under pressure: Continue manned testing to validate these procedures.</p> <p>*Prototype development and transition of a device to detect Submarine Escape Action Limits (SEAL) levels for the seven contaminants of interest in real time and down to pressures as high as 5 ATA to replace the maligned, difficult to operate frequently inaccurate Draeger tubes currently onboard USN submarines.</p> <p>FY 2024 Base Plans:</p> <p>*Multi-Year Project Support: Completion of projects initiated in prior fiscal years will be supported where progress is deemed acceptable and project goals remain valid and attainable.</p>								

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603713N / <i>Ocean Engineering Tech Dev</i>		Project (Number/Name) 0099 / <i>Deep Submergence Bio Med Dev</i>	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>*Complete prototype development and transition of a device to detect Submarine Escape Action Limits (SEAL) levels for the seven contaminants of interest in real time and down to pressures as high as 5 ATA to replace the maligned, difficult to operate frequently inaccurate Draeger tubes currently onboard USN submarines.</p> <p>*Assess Impact of CO2 on Pressurized DISSUB survival: Complete animal research to answer the question regarding whether elevated CO2 levels will accelerate onset of Pulmonary O2 Toxicity and increase mortality during high internal pressure DISSUB scenarios.</p> <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Increase of +\$0.04M from FY 2023 to FY 2024 will provide a modest increase for labor costs associated with labor intensive human and animal subject projects across these two fiscal years. This allocation reflects continued strong interest in addressing challenging, real-time physiologic problems related to enhancing diver performance and range of operations.</p>					
Accomplishments/Planned Programs Subtotals	4.354	3.082	2.433	0.000	2.433
C. Other Program Funding Summary (\$ in Millions) N/A					
Remarks					
D. Acquisition Strategy Integrated thrust area teams (e.g., decompression research) are established with university, commercial, and in-house Navy labs to jointly execute biomedical Research and Development (R&D). Peer review of research proposals accomplished by independent Technical Advisory Board. Annual review of progress by Executive Review Board (CNO/NAVSEA/ONR/BUMED). Program management by 0-6 Undersea Medical Officer. Contracting by competitive process using Business Area Analysis (BAA) and leveraging Office of Naval Research (ONR) capabilities.					

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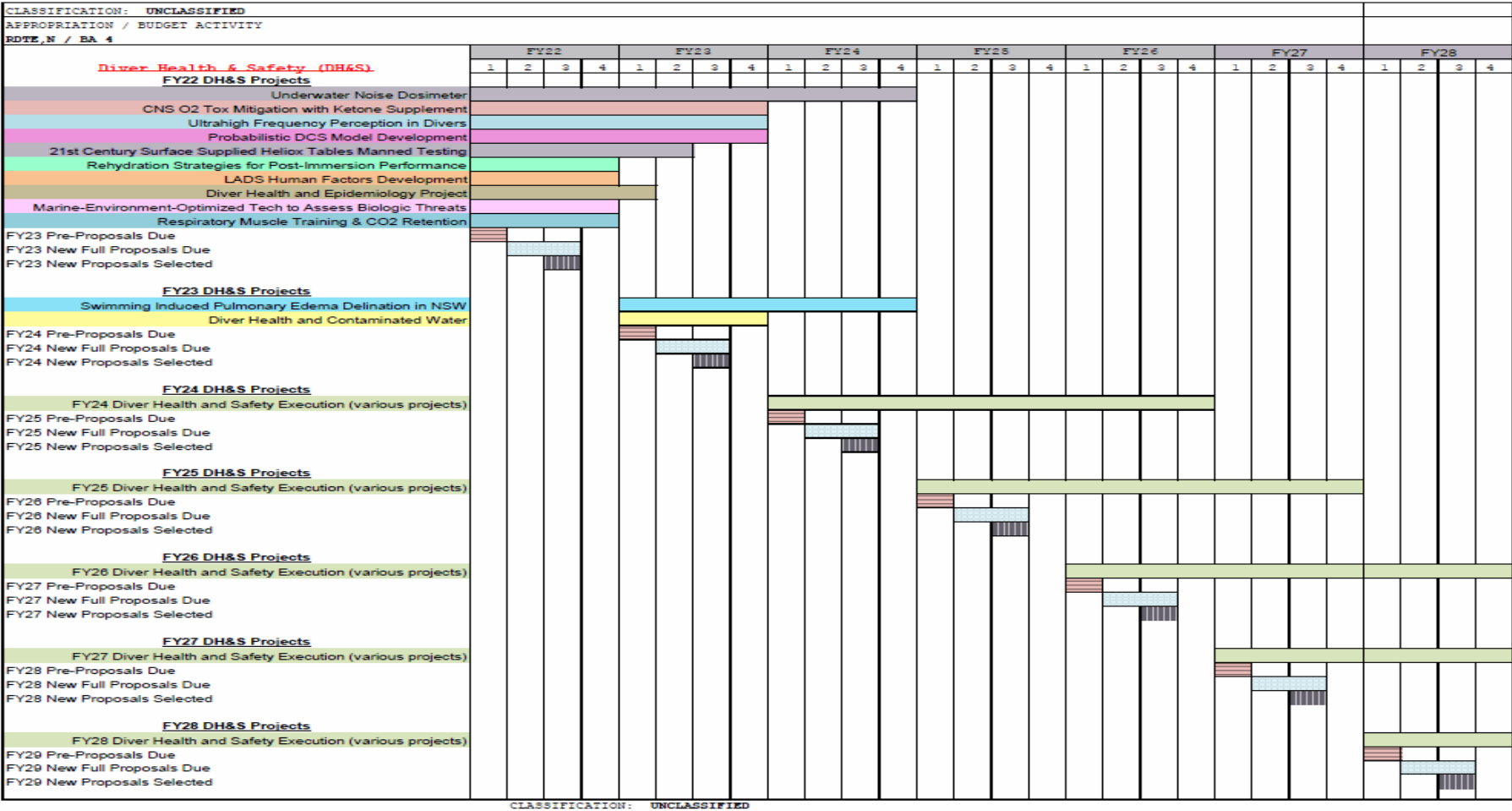
Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603713N / Ocean Engineering Tech D ev				Project (Number/Name) 0099 / Deep Submergence Bio Med Dev					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NEDU : Panama City, FL	26.136	0.899	Dec 2021	0.451	Nov 2022	0.140	Nov 2023	-		0.140	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NMRC : Silver Spring, MD	12.899	0.000		0.200	Nov 2022	0.330	Nov 2023	-		0.330	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	C/FFP	DUKE UNIV : Durham, NC	4.910	1.056	Mar 2022	0.746	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	C/FFP	SUNY : Buffalo, NY	2.795	0.325	Apr 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	C/CPFF	JHU APL : Laurel, MD	0.964	0.296	Jan 2022	0.312	Nov 2022	0.333	Nov 2023	-		0.333	0.000	1.905	-
Developmental Test & Evaluation (DT&E)	WR	NAVWAR : San Diego, CA	0.453	0.205	Dec 2021	0.000		0.000		-		0.000	0.000	0.658	-
Developmental Test & Evaluation (DT&E)	Various	Various : Various	0.000	0.000		0.000		1.002	Nov 2023	-		1.002	0.000	1.002	-
Developmental Test & Evaluation (DT&E)	C/FFP	ASHWIN-USHAS CORP: : Marlboro, NJ	0.345	0.386	Jun 2022	0.000		0.000		-		0.000	0.000	0.731	-
Developmental Test & Evaluation (DT&E)	C/CPAF	GPC : Irvine, CA	0.000	0.250	Jun 2022	0.000		0.000		-		0.000	0.000	0.250	-
Developmental Test & Evaluation (DT&E)	WR	NSMRL : Groton, CT	0.000	0.869	Apr 2022	1.025	Nov 2022	0.277	Nov 2023	-		0.277	0.000	2.171	-
Developmental Test & Evaluation (DT&E)	C/BA	UCSD : San Diego, CA	0.000	0.000		0.161	Nov 2022	0.166	Nov 2023	-		0.166	0.000	0.327	-
Subtotal			48.502	4.286		2.895		2.248		-		2.248	Continuing	Continuing	N/A
Remarks															
1. There is a notable decrease in the program funding allocation to NEDU, SUNY Buffalo, JHU APL and NAVWAR in FY23. This relates to the planned funding and completion of projects at the end of FY22 for these institutions. Proposal submissions were either not submitted or not selected for funding for FY22 and subsequent out-years. 2. Costs shown as 'various' reflect the funds that will be used to sponsor future research. Just as the funding control for FY-24 is a projection of funds to be allocated for continuing the work performed by the Deep Submergence Biomedical Development Program, these 'various' funds are yet-to-be assigned funds, based on the established PBIS controls, for work that will start in that future year (in this case FY-24). The exact details of the studies initiated with these funds will be determined as part of the established annual project selection process, as defined in NAVSEAINST 3900.10A and under BAA-21-G-01. These are not discretionary funds, but rather funds allocated for future, to-be-determined research, according to established guidelines.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603713N / Ocean Engineering Tech Dev						Project (Number/Name) 0099 / Deep Submergence Bio Med Dev			
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Various	Various : Various	0.725	0.068	Aug 2022	0.064	Aug 2023	0.060	Aug 2024	-		0.060	Continuing	Continuing	Continuing
SBIR Assessment	Various	Various : Various	0.000	0.000		0.123	Oct 2022	0.125	Oct 2023	-		0.125	0.000	0.248	-
Subtotal			0.725	0.068		0.187		0.185		-		0.185	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			49.227	4.354		3.082		2.433		-		2.433	Continuing	Continuing	N/A
Remarks															

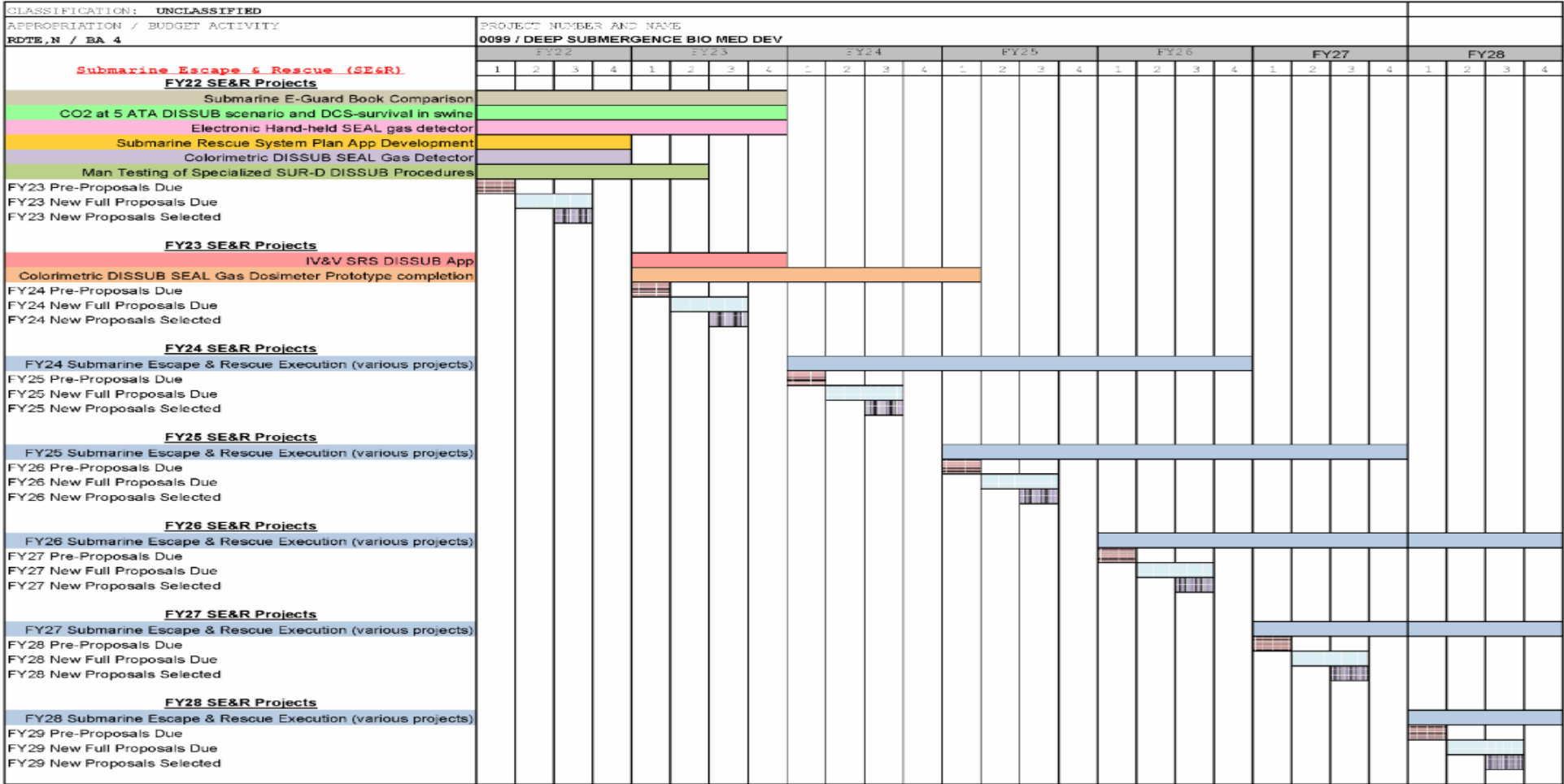
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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)		Project (Number/Name)
1319 / 4		PE 0603713N / Ocean Engineering Tech D ev		0099 / Deep Submergence Bio Med Dev



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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity		R-1 Program Element (Number/Name)		Project (Number/Name)	
1319 / 4		PE 0603713N / Ocean Engineering Tech D ev		0099 / Deep Submergence Bio Med Dev	



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603713N / <i>Ocean Engineering Tech Dev</i>	Project (Number/Name) 0099 / <i>Deep Submergence Bio Med Dev</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 0099				
Diver Health & Safety (DH&S): FY22 DH&S Projects: Underwater Noise Dosimeter	1	2022	4	2024
Diver Health & Safety (DH&S): FY22 DH&S Projects: CNS O2 Tox Mitigation with Ketone Supplement	1	2022	4	2023
Diver Health & Safety (DH&S): FY22 DH&S Projects: Ultrahigh Frequency Perception in Divers	1	2022	4	2023
Diver Health & Safety (DH&S): FY22 DH&S Projects: Probabilistic DCS Model Development	1	2022	4	2023
Diver Health & Safety (DH&S): FY22 DH&S Projects: 21st Century Surface Supplied Heliox Tables Manned Testing	1	2022	2	2023
Diver Health & Safety (DH&S): FY22 DH&S Projects: Rehydration Strategies for Post-Immersion Performance	1	2022	4	2022
Diver Health & Safety (DH&S): FY22 DH&S Projects: LADS Human Factors Development	1	2022	4	2022
Diver Health & Safety (DH&S): FY22 DH&S Projects: Diver Health and Epidemiology Project	1	2022	1	2023
Diver Health & Safety (DH&S): FY22 DH&S Projects: Marine-Environment-Optimized Tech to Assess Biologic Threats	1	2022	4	2022
Diver Health & Safety (DH&S): FY22 DH&S Projects: Respiratory Muscle Training & CO2 Retention	1	2022	4	2022
Diver Health & Safety (DH&S): FY23 Pre-Proposals Due	1	2022	1	2022
Diver Health & Safety (DH&S): FY23 New Full Proposals Due	2	2022	3	2022
Diver Health & Safety (DH&S): FY23 New Proposals Selected	3	2022	3	2022
Diver Health & Safety (DH&S): FY23 DH&S Projects: Swimming Induced Pulmonary Edema Delineation in NSW	1	2023	4	2024

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603713N / Ocean Engineering Tech D ev		Project (Number/Name) 0099 / Deep Submergence Bio Med Dev	
	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
Diver Health & Safety (DH&S): FY23 DH&S Projects: Diver Health and Contaminated Water	1	2023	4	2023
Diver Health & Safety (DH&S): FY24 Pre-Proposals Due	1	2023	1	2023
Diver Health & Safety (DH&S): FY24 New Full Proposals Due	2	2023	3	2023
Diver Health & Safety (DH&S): FY24 New Proposals Selected	3	2023	3	2023
Diver Health & Safety (DH&S): FY24 DH&S Projects: FY24 Diver Health and Safety Execution (various projects)	1	2024	4	2026
Diver Health & Safety (DH&S): FY25 Pre-Proposals Due	1	2024	1	2024
Diver Health & Safety (DH&S): FY25 New Full Proposals Due	2	2024	3	2024
Diver Health & Safety (DH&S): FY25 New Proposals Selected	3	2024	3	2024
Diver Health & Safety (DH&S): FY25 DH&S Projects: FY25 Diver Health and Safety Execution (various projects)	1	2025	4	2027
Diver Health & Safety (DH&S): FY26 Pre-Proposals Due	1	2025	1	2025
Diver Health & Safety (DH&S): FY26 New Full Proposals Due	2	2025	3	2025
Diver Health & Safety (DH&S): FY26 New Proposals Selected	3	2025	3	2025
Diver Health & Safety (DH&S): FY26 DH&S Projects: FY26 Diver Health and Safety Execution (various projects)	1	2026	4	2028
Diver Health & Safety (DH&S): FY27 Pre-Proposals Due	1	2026	1	2026
Diver Health & Safety (DH&S): FY27 New Full Proposals Due	2	2026	3	2026
Diver Health & Safety (DH&S): FY27 New Proposals Selected	3	2026	3	2026
Diver Health & Safety (DH&S): FY27 DH&S Projects: FY27 Diver Health and Safety Execution (various projects)	1	2027	4	2028
Diver Health & Safety (DH&S): FY28 Pre-Proposals Due	1	2027	1	2027
Diver Health & Safety (DH&S): FY28 New Full Proposals Due	2	2027	3	2027
Diver Health & Safety (DH&S): FY28 New Proposals Selected	3	2027	3	2027
Diver Health & Safety (DH&S): FY28 DH&S Projects: FY28 Diver Health and Safety Execution (various projects)	1	2028	4	2028

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603713N / Ocean Engineering Tech D ev		Project (Number/Name) 0099 / Deep Submergence Bio Med Dev	
	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
Diver Health & Safety (DH&S): FY29 Pre-Proposals Due	1	2028	1	2028
Diver Health & Safety (DH&S): FY29 New Full Proposals Due	2	2028	3	2028
Diver Health & Safety (DH&S): FY29 New Proposals Selected	3	2028	3	2028
Submarine Escape & Rescue (SE&R): FY22 SE&R Projects: Submarine E-Guard Book Comparison	1	2022	4	2023
Submarine Escape & Rescue (SE&R): FY22 SE&R Projects: CO2 at 5 ATA DISSUB scenario and DCS-survival in swine	1	2022	4	2023
Submarine Escape & Rescue (SE&R): FY22 SE&R Projects: Electronic Hand-held SEAL gas detector	1	2022	4	2023
Submarine Escape & Rescue (SE&R): FY22 SE&R Projects: Submarine Rescue System Plan App Development	1	2022	4	2022
Submarine Escape & Rescue (SE&R): FY22 SE&R Projects: Colorimetric DISSUB SEAL Gas Detector	1	2022	4	2022
Submarine Escape & Rescue (SE&R): FY22 SE&R Projects: Man Testing of Specialized SUR-D DISSUB Procedures	1	2022	2	2023
Submarine Escape & Rescue (SE&R): FY23 Pre-Proposals Due	1	2022	1	2022
Submarine Escape & Rescue (SE&R): FY23 New Full Proposals Due	2	2022	3	2022
Submarine Escape & Rescue (SE&R): FY23 New Proposals Selected	3	2022	3	2022
Submarine Escape & Rescue (SE&R): FY23 SE&R Projects: IV&V SRS DISSUB App	1	2023	4	2023
Submarine Escape & Rescue (SE&R): FY23 SE&R Projects: Colorimetric DISSUB SEAL Gas Dosimeter Prototype completion	1	2023	1	2025
Submarine Escape & Rescue (SE&R): FY24 Pre-Proposals Due	1	2023	1	2023
Submarine Escape & Rescue (SE&R): FY24 New Full Proposals Due	2	2023	3	2023
Submarine Escape & Rescue (SE&R): FY24 New Proposals Selected	3	2023	3	2023
Submarine Escape & Rescue (SE&R): FY24 SE&R Projects: FY24 Submarine Escape & Rescue Execution (various projects)	1	2024	4	2026
Submarine Escape & Rescue (SE&R): FY25 Pre-Proposals Due	1	2024	1	2024

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603713N / Ocean Engineering Tech Dev		Project (Number/Name) 0099 / Deep Submergence Bio Med Dev	
	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
Submarine Escape & Rescue (SE&R): FY25 New Full Proposals Due	2	2024	3	2024
Submarine Escape & Rescue (SE&R): FY25 New Proposals Selected	3	2024	3	2024
Submarine Escape & Rescue (SE&R): FY25 SE&R Projects: FY25 Submarine Escape & Rescue Execution (various projects)	1	2025	4	2027
Submarine Escape & Rescue (SE&R): FY26 Pre-Proposals Due	1	2025	1	2025
Submarine Escape & Rescue (SE&R): FY26 New Full Proposals Due	2	2025	3	2025
Submarine Escape & Rescue (SE&R): FY26 New Proposals Selected	3	2025	3	2025
Submarine Escape & Rescue (SE&R): FY26 SE&R Projects: FY26 Submarine Escape & Rescue Execution (various projects)	1	2026	4	2028
Submarine Escape & Rescue (SE&R): FY27 Pre-Proposals Due	1	2026	1	2026
Submarine Escape & Rescue (SE&R): FY27 New Full Proposals Due	2	2026	3	2026
Submarine Escape & Rescue (SE&R): FY27 New Proposals Selected	3	2026	3	2026
Submarine Escape & Rescue (SE&R): FY27 SE&R Projects: FY27 Submarine Escape & Rescue Execution (various projects)	1	2027	4	2028
Submarine Escape & Rescue (SE&R): FY28 Pre-Proposals Due	1	2027	1	2027
Submarine Escape & Rescue (SE&R): FY28 New Full Proposals Due	2	2027	3	2027
Submarine Escape & Rescue (SE&R): FY28 New Proposals Selected	3	2027	3	2027
Submarine Escape & Rescue (SE&R): FY28 SE&R Projects: FY28 Submarine Escape & Rescue Execution (various projects)	1	2028	4	2028
Submarine Escape & Rescue (SE&R): FY29 Pre-Proposals Due	1	2028	1	2028
Submarine Escape & Rescue (SE&R): FY29 New Full Proposals Due	2	2028	3	2028
Submarine Escape & Rescue (SE&R): FY29 New Proposals Selected	3	2028	3	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603713N / Ocean Engineering Tech Dev				Project (Number/Name) 0394 / Shallow Depth Diving EQ			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0394: Shallow Depth Diving EQ	33.223	4.193	3.111	8.318	-	8.318	13.215	7.074	6.098	5.395	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops systems to support submarine escape and rescue missions, and conventional diver operations. Diver operations include ship husbandry, salvage/recovery, and submarine rescue operations to support national, as well as Navy, needs around the world. Modern certifiable diving systems that ensure diver safety and allow maximum work efficiency will replace currently antiquated systems. R&D will be performed in the areas of diver tools to improve work efficiency, tracking and navigation, visual enhancement, contaminated water diving, diver environmental protection, and recompression chamber technology.

This project develops systems to support Naval Expeditionary Combat Command Diving. Operations include salvage/recover and underwater construction to support national, as well as Navy, needs around the world. Modern certifiable diving systems that ensure diver safety and allow maximum work efficiency will replace currently antiquated systems. R&D will be performed in the areas of diver tools to improve work efficiency, tracking and navigation, visual enhancement, contaminated water diving, diver environmental protection and recompression chamber technology.

Requirements:

Operational Requirements Document, Revision 2 for Submarine Rescue Diving and Recompression System (SRDRS) Serial 694-87-06 dtd 6 June 2006

COMSUBLANT/COMSUBPAC OPORD 2137 (Submarine Rescue) dtd 5 Aug 2014

Mission Needs Statement, M016402-92

Survivability, OPNAV N87 ltr Serial N87/5U659719 dtd 30 Jan 1995

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Shallow Depth Diving EQ - Diving (N97)	1.624	1.077	1.975	0.000	1.975
Articles:	-	-	-	-	-
Description: Continued research into all engineering and equipment design aspects of manned diving, to include: life support, contaminated water, SCUBA, gas analysis, thermal protection, saturation diving, and divers tools.					
FY 2023 Plans: * DAVD System Improvement: Start work on developing a self contained DAVD that does not rely on surface umbilicals or fixed sonar installations. This will allow HUD systems and onboard spatial awareness without the requirement to be tethered to the surface.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603713N / Ocean Engineering Tech D ev		Project (Number/Name) 0394 / Shallow Depth Diving EQ		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
* Authorized for Navy Use (ANU) Item Testing / Retesting: Testing of life support and other underwater systems for inclusion on the ANU list. This will include both testing of existing ANU items to ensure continued compliance with configuration management and quality or the testing of new items that are desired by fleet divers.						
* Deep Sea Expeditionary No "D" (DSEND) Suit: Develop and test a 30 fsw form-fitting 1ATA suit prototype and commence development of a 300 fsw suit based on successful demonstration of the 30 fsw prototype. This will allow Navy divers to work at significant depths in a self-propelled, flexible suit without the need to perform lengthy decompression or be at risk for decompression sickness.						
* Contaminated Environment Equipment Testing: Conduct testing on diver protective equipment for limited contaminated water environments. This equipment will allow divers to safely enter contaminated environments to conduct necessary salvage operations.						
FY 2024 Base Plans:						
* Deep Sea Expeditionary No "D" (DSEND) Suit: Develop and test a 30 fsw form-fitting 1ATA suit prototype and commence development of a 300 fsw suit based on successful demonstration of the 30 fsw prototype. This will allow Navy divers to work at significant depths in a self-propelled, flexible suit without the need to perform lengthy decompression or be at risk for decompression sickness.						
* Transportable Recompression Chamber System (TRCS)/Standard Navy Double Lock (SNDL) Recompression Chamber/Flyaway Dive System (FADS)/etc. Lifespan Evaluation: High value infrastructure diving equipment has been serving in the fleet for two decades or more. This work will be to conduct a Fitness-for-Service evaluation of the subject equipment to understand material condition and inform decision to overhaul or replace subject equipment.						
* Air Sensor Development and Testing: Start development of sensors to analyze for CO2, oil and particulates in chambers and diver life support systems. These sensors will allow divers to maintain and monitor air purity in breathing gases.						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603713N / Ocean Engineering Tech D ev		Project (Number/Name) 0394 / Shallow Depth Diving EQ		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
* ANU Item Testing / Retesting: Testing of life support and other underwater systems for inclusion on the ANU list. This will include both testing of existing ANU items to ensure continued compliance with configuration management and quality or the testing of new items that are desired by fleet divers. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: An increase of +\$0.898M in FY24 is to enable the start of equipment life extension analyses and contaminated environment equipment development.						
Title: Shallow Depth Diving EQ - Submarine Escape and Rescue Articles: Description: Research, development, testing, design, procurement and installation of technologies to support improvements, increase resiliency, and increase capabilities of equipment, processes and procedures required to ensure successful escape and rescue of Distressed Submarine (DISSUB) survivors and to allow for a minimum 15 year system service life extension. The ability to ensure successful escape and rescue is a core function of the Undersea Warfare enterprise. FY 2023 Plans: Complete examination of a material solution to achieve service life extension for the submarine rescue system as needed prior to end of existing Submarine Rescue System (SRS) end of life. Conduct engineering and alternatives investigation for materiel solutions that addresses the documented capability gaps for the SRS impacting sustainability and reliability. This effort will develop and outline system level design needs that addresses upgrades for obsolescence and resiliency, as well as comparing upgrades to replacement options for the system. It also develops solutions to reduce reliance on single-source foreign suppliers addressing current critical requirements gaps. Includes Engineering evaluation of system capability increases to include, but not limited to: Micro-electronics System Upgrades, Electro-Optics for Launch and Recovery System (LARS) to address current Sea State Limitations and provide real-time diagnostics for LARS loads and accelerations, Atmospheric Sensing and Scrubbing to reduce current operational and maintenance requirements by replacing obsolete Analox Units and hand-pumps used, Through-hull communications to provide end-to-end DISSUB communications system that provides increased capabilities by allowing rescue from an unresponsive submarine. FY 2024 Base Plans:		2.569 -	2.034 -	5.073 -	0.000 -	5.073 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603713N / Ocean Engineering Tech D ev		Project (Number/Name) 0394 / Shallow Depth Diving EQ		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Begin development, test, design and procurement of critical technologies necessary to support a planned minimum 15 year system service life extension as part of the Submarine Rescue System (SRS) Modernization program. Many SRS subsystems and components necessary to meet mission requirements have known capability gaps, are obsolete, result in higher than sustainable maintenance costs and higher than acceptable risks. Program is intended to proactively address system deficiencies and upgrade many system subcomponents to a System of System's approach to ensure adequate technology margins are, and will remain, available. Planned upgrades include, but are not limited to, Micro-electronics System Upgrades, Electro-Optics for Launch and Recovery System (LARS) to address current Sea State Limitations and provide real-time diagnostics for LARS loads and accelerations, Atmospheric Sensing and Scrubbing to reduce current operational and maintenance requirements by replacing obsolete Analox Units and hand-pumps used, Through-hull communications to provide end-to-end DISSUB communications system that provides increased capabilities by allowing rescue from an unresponsive submarine. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: FY2024 increase of +\$3.039M is required by the Navy in order to provide a credible U.S. Submarine Rescue System (SRS) for our sailors and ally partner nations. As part of detailed review, Navy determined the system had not been funded sufficiently to properly modernize the system and FY24 budget increase is to support this. The modernization of SRS is required to address known reliability and obsolescence issues and support the planned minimum 15 year system service life extension prior to SRS's end of life and inoperability.						
Title: Shallow Depth Diving EQ - Diving (N95) <div>Articles:</div> Description: Research into all engineering and equipment design aspects of manned diving, to include: life support, contaminated water, self contained underwater breathing apparatus (SCUBA), gas analysis, thermal protection, saturation diving, mixed gas diving, and divers tools. FY 2023 Plans: N/A FY 2024 Base Plans: Fly Away Mixed Gas (FMGS) System Refresh: At NECC request, develop and test an improved FMGS to reduce the size of the console and add an in-line semi closed rebreather system. The changes will improve		0.000 -	0.000 -	1.270 -	0.000 -	1.270 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603713N / <i>Ocean Engineering Tech Dev</i>		Project (Number/Name) 0394 / <i>Shallow Depth Diving EQ</i>	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
transportability, significantly reduce gas (HeO2) usage, and increase the time available when switching to the emergency gas supply (EGS) and are designed to significantly reduce safety hazards to the divers. <i>FY 2024 OCO Plans:</i> N/A <i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> An increase of +\$1.27M in FY24 enables the start of the FMGS refresh design, development and testing requested by the combatant commander, NECC. While increasing the U.S. Navy undersea search and salvage capability between 150-300 FSW, this RDT&E is required to fund equipment design and provide a prototype set of equipment for follow-on testing and evaluation. In addition to increasing mission capability, this system will increase the EGS gas availability by approximately 30 minutes and reduce HeO2 usage by up to 80%. Both these improvements will reduce the operational risks to the divers and provide a financial return on investment.					
Accomplishments/Planned Programs Subtotals	4.193	3.111	8.318	0.000	8.318

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPN/0955: <i>Deep Subm Sys Proj (DSSP) Equip</i>	3.282	3.660	4.623	-	4.623	4.589	5.876	7.198	5.944	Continuing	Continuing
• OPN/1130: <i>Diving and Salvage Equipment</i>	10.772	11.773	18.086	-	18.086	17.499	17.877	14.716	13.043	0.000	171.772

Remarks

D. Acquisition Strategy

Diving Program acquisitions are executed and managed by SEA00C. Acquisitions are made for both COTS and developmental items as required to ensure adequate operational availability and safety of the diver. R&D projects are selected in March for a November award using a Broad Area Announcement. Submarine Rescue Systems - SBIR contract is in place to support development and design.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603713N / Ocean Engineering Tech D ev				Project (Number/Name) 0394 / Shallow Depth Diving EQ					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering - Design, Test, Integration (PMS-390)	C/CPFF	Oceaneering : Hanover, MD	26.981	0.658	Jan 2022	0.000		0.300	Oct 2023	-		0.300	0.000	27.939	-
Systems Engineering - Design, Integration (PMS-390)	WR	NUWC : Newport, RI	0.399	0.052	Nov 2021	0.000		0.000		-		0.000	0.000	0.451	-
Systems Engineering - Design, Test, Integration (PMS-390)	WR	PNSY : Portsmouth, NH	0.250	0.300	Oct 2021	0.454	Oct 2022	0.373	Oct 2023	-		0.373	0.000	1.377	-
Diving Equipment Product Development (00C)	C/CPFF	Phoenix : Largo, MD	0.885	0.477	Oct 2021	0.350	Oct 2022	0.550	Oct 2023	-		0.550	0.000	2.262	-
Diving Equipment Product Development (00C)	C/FFP	Coda Octopus : Orlando, FL	0.000	0.119	Jul 2022	0.120	Oct 2022	0.100	Oct 2023	-		0.100	Continuing	Continuing	Continuing
Diving Equipment Product Development (00C)	C/CPFF	PCCI : Alexandria, VA	2.251	0.000		0.000		0.200	Oct 2023	-		0.200	0.000	2.451	-
Diving Equipment Product Development (00C)	WR	NSWC-PC : Panama City, FL	0.807	0.240	Mar 2022	0.240	Oct 2022	0.280	Oct 2023	-		0.280	Continuing	Continuing	Continuing
Diving Equipment Product Development (00C)	C/CPFF	GPC : Irvine, CA	0.437	0.170	Jan 2022	0.000		0.000		-		0.000	0.000	0.607	-
Diving Equipment Product Development (00C)	TBD	Polestar : Needham Heights, MA	0.000	0.000		0.000		0.180	Oct 2023	-		0.180	0.000	0.180	-
Systems Engineering - Design, Test, Integration (PMS-390)	C/CPFF	Penn state UARC : Penn State, PA	0.214	1.231	Nov 2021	0.000		3.000	Nov 2023	-		3.000	0.000	4.445	-
Systems Engineering - Design, Integration (PMS-390)	C/CPFF	JHU : Baltimore, MD	0.000	0.328	Dec 2021	1.580	Jan 2023	0.000		-		0.000	0.000	1.908	-
Diving Equipment Product Development (00C)	WR	NEDU : Panama City, FL	0.139	0.368	Dec 2021	0.274	Oct 2023	0.386	Oct 2023	-		0.386	0.000	1.167	-
Systems Engineering - Design, Integration (00C for PMS-390)	C/CPFF	ACI Technologies, Inc : Philadelphia, PA	0.115	0.000		0.000		0.000		-		0.000	0.000	0.115	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603713N / Ocean Engineering Tech D ev				Project (Number/Name) 0394 / Shallow Depth Diving EQ					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Diving Equipment Product Development (00C)	WR	NAVFAC EXWC : Port Hueneme, CA	0.000	0.250	Oct 2021	0.000		0.150	Oct 2023	-		0.150	0.000	0.400	-
Diving Equipment Product Development (00C N95)	TBD	James Fischer Defence : Aberdeen : Aberdeen, Scotland	0.000	0.000		0.000		1.270	Oct 2023	-		1.270	0.000	1.270	-
Systems Engineering - Design, Test, Integration (PMS-390)	C/CPFF	TBD : TBD	0.000	0.000		0.000		1.400	Jan 2024	-		1.400	0.000	1.400	-
Subtotal			32.478	4.193		3.018		8.189		-		8.189	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel (00C)	Various	NAVSEA : Washington, DC	0.159	0.000	Oct 2021	0.020	Oct 2022	0.020	Oct 2023	-		0.020	Continuing	Continuing	Continuing
SBIR Assessment	Various	Various : Various	0.513	0.000	Oct 2021	0.043	Oct 2022	0.079	Oct 2023	-		0.079	0.000	0.635	-
Program Management Support (00C)	C/CPFF	Unknown : Not Specified	0.073	0.000		0.030	Oct 2022	0.030	Oct 2023	-		0.030	Continuing	Continuing	Continuing
Subtotal			0.745	0.000		0.093		0.129		-		0.129	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			33.223	4.193		3.111		8.318		-		8.318	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603713N / Ocean Engineering Tech D ev	Project (Number/Name) 0394 / Shallow Depth Diving EQ

CLASSIFICATION: UNCLASSIFIED		PROJECT NUMBER AND NAME																											
APPROPRIATION/BUDGET ACTIVITY		0394 / SHALLOW DEPTH DIVING EQ																											
RDTE, N / BA 4		FY22				FY23				FY24				FY25				FY26				FY27				FY28			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
FY22 Shallow Depth Diving Equipment Execution																													
Contaminated Water Equipment Testing																													
DAVD System Improvements (Gen 3)																													
Lightweight 1ATA Dive Suit (LADS) Development & Testing																													
ANU Item Testing																													
Submarine Rescue System (SRS) Shallower Design/Development																													
FY23 Pre-Proposals Due																													
FY23 New Full Proposals Due																													
FY23 New Proposals Selected																													
FY23 Shallow Depth Diving Equipment Execution																													
Contaminated Water Equipment Testing																													
DAVD System Improvements (Gen 3)																													
Deep Sea Expeditionary No "D" (DSEND) Suit																													
ANU Item Testing																													
Submarine Rescue System (SRS) Capability Evaluation																													
FY24 Pre-Proposals Due																													
FY24 New Full Proposals Due																													
FY24 New Proposals Selected																													
FY24 Shallow Depth Diving Equipment Execution																													
TRCS/SNDL/FADS/etc Lifespan Evaluation																													
Air Sensor Development and Testing																													
Deep Sea Expeditionary No "D" (DSEND) Suit																													
ANU Item Testing																													
Submarine Rescue System (SRS) Modernization Program																													
Microelectronics Redesign																													
Integrated Cross Deck Communications																													
Electro-optic Sensors for Launch and Recovery																													
Oxygen Delivery and Monitoring System																													
FY25 Pre-Proposals Due																													
FY25 New Full Proposals Due																													
FY25 New Proposals Selected																													
FY25 Shallow Depth Diving Equipment Execution																													
Deep Sea Expeditionary No "D" (DSEND) Suit																													
TRCS/SNDL/FADS/etc Lifespan Evaluation																													
Diver Tracking Device Testing																													
Dive Side Personnel Reduction Study																													
DAVD / MK18 UUV Sensor Integration																													
ANU Item Testing																													
Submarine Rescue System (SRS) Modernization Program																													
Microelectronics Redesign																													
Condition Based Maintenance																													
Electro-optic Sensors for Launch and Recovery																													
Noise Abatement																													
Pressurized Rescue Module (PRM) Atmospheric Sensing																													
Anchor Handler Tug System (AHTS) Mobilization																													
Oxygen Delivery and Monitoring System																													

CLASSIFICATION: UNCLASSIFIED

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603713N / Ocean Engineering Tech D ev	Project (Number/Name) 0394 / Shallow Depth Diving EQ

CLASSIFICATION: UNCLASSIFIED	
APPROPRIATION/BUDGET ACTIVITY	
RDTE, N / BA 4	
PROJECT NUMBER AND NAME	
0394 / SHALLOW DEPTH DIVING EQ	
FY25 Shallow Depth Diving Equip Execution (continued)	
FY26 Pre-Proposals Due	
FY26 New Full Proposals Due	
FY26 New Proposals Selected	
FY26 Shallow Depth Diving Equipment Execution	
Diver Tracking Device Testing	
DAVD / MK18 UUV Sensor Integration	
ANU Item Testing	
MK29 Testing and Evaluation	
KM37 DP Integration Testing and Evaluation	
Submarine Rescue System (SRS) Modernization Program	
Microelectronics Redesign	
Electro-optic Sensors for Launch and Recovery	
Condition Based Maintenance	
Noise Abatement	
Pressurized Rescue Module (PRM) Atmospheric Sensing	
Anchor Handler Tug System (AHTS) Mobilization	
Oxygen Delivery and Monitoring System	
Electronic Breathing System (EBS) Hose Redesign	
Thru-Hull Communications	
Augmented Reality/Virtual Reality (AR/VR) Trainer	
Active Motion Heave Compensation	
FY27 Pre-Proposals Due	
FY27 New Full Proposals Due	
FY27 New Proposals Selected	
FY27 Shallow Depth Diving Equipment Execution	
ANU Item Testing	
MK29 Testing and Evaluation	
KM37 DP Integration Testing and Evaluation	
High Pressure Air & Oxygen Components	
Submarine Rescue System (SRS) Modernization Program	
Microelectronics Redesign	
Active Motion Heave Compensation	
FY28 Pre-Proposals Due	
FY28 New Full Proposals Due	
FY28 New Proposals Selected	
FY28 Shallow Depth Diving Equipment Execution	
ANU Item Testing	
High Pressure Air & Oxygen Components	
Contaminated Water Sensors	
Submarine Rescue System (SRS) Modernization Program	
Active Motion Heave Compensation	
FY29 Pre-Proposals Due	
FY29 New Full Proposals Due	
FY29 New Proposals Selected	

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603713N / <i>Ocean Engineering Tech Dev</i>	Project (Number/Name) 0394 / <i>Shallow Depth Diving EQ</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 0394				
FY22 Shallow Depth Diving Equipment Execution: Contaminated Water Equipment Testing	1	2022	4	2022
FY22 Shallow Depth Diving Equipment Execution: DAVD System Improvements (Gen 3)	1	2022	4	2022
FY22 Shallow Depth Diving Equipment Execution: Lightweight 1ATA Dive Suit (LADS) Development & Testing	1	2022	4	2022
FY22 Shallow Depth Diving Equipment Execution: ANU Item Testing	1	2022	4	2022
FY22 Shallow Depth Diving Equipment Execution: Submarine Rescue System (SRS) Shallower Design/Development	1	2022	1	2023
FY23 Pre-Proposals Due	1	2022	1	2022
FY23 New Full Proposals Due	2	2022	3	2022
FY23 New Proposals Selected	3	2022	3	2022
'FY23 Shallow Depth Diving Equipment Execution: Contaminated Water Equipment TestingDetail	1	2023	4	2023
'FY23 Shallow Depth Diving Equipment Execution: DAVD System Improvements (Gen 3)	1	2023	4	2023
'FY23 Shallow Depth Diving Equipment Execution: Deep Sea Expeditionary No "D" (DSEND) Suit	1	2023	4	2023
'FY23 Shallow Depth Diving Equipment Execution: ANU Item Testing	1	2023	4	2023
'FY23 Shallow Depth Diving Equipment Execution: Submarine Rescue System (SRS) Capability Evaluation	2	2023	1	2024
FY24 Pre-Proposals Due	1	2023	1	2023
FY24 New Full Proposals Due	2	2023	3	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603713N / Ocean Engineering Tech D ev		Project (Number/Name) 0394 / Shallow Depth Diving EQ	
Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
FY24 New Proposals Selected	3	2023	3	2023
'FY24 Shallow Depth Diving Equipment Execution: TRCS/SNDL/FADS/etc Lifespan Evaluation	1	2024	4	2024
'FY24 Shallow Depth Diving Equipment Execution: Air Sensor Development and Testing	1	2024	4	2024
'FY24 Shallow Depth Diving Equipment Execution: Deep Sea Expeditionary No "D" (DSEND) Suit	1	2024	4	2024
'FY24 Shallow Depth Diving Equipment Execution: ANU Item Testing	1	2024	4	2024
'FY24 Shallow Depth Diving Equipment Execution: Submarine Rescue System (SRS) Modernization Program	2	2024	4	2028
'FY24 Shallow Depth Diving Equipment Execution: Microelectronics Redesign	2	2024	4	2027
'FY24 Shallow Depth Diving Equipment Execution: Integrated Cross Deck Communications	2	2024	1	2025
'FY24 Shallow Depth Diving Equipment Execution: Electro-optic Sensors for Launch and Recovery	2	2024	1	2026
'FY24 Shallow Depth Diving Equipment Execution: Oxygen Delivery and Monitoring System	2	2024	1	2026
FY25 Pre-Proposals Due	1	2024	1	2024
FY25 New Full Proposals Due	2	2024	3	2024
FY25 New Proposals Selected	3	2024	3	2024
'FY25 Shallow Depth Diving Equipment Execution: Deep Sea Expeditionary No "D" (DSEND) Suit	1	2025	4	2025
'FY25 Shallow Depth Diving Equipment Execution: TRCS/SNDL/FADS/etc Lifespan Evaluation	1	2025	4	2025
'FY25 Shallow Depth Diving Equipment Execution: Diver Tracking Device Testing	1	2025	4	2025
'FY25 Shallow Depth Diving Equipment Execution: Dive Side Personnel Reduction Study	1	2025	4	2025

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603713N / Ocean Engineering Tech Dev

Project (Number/Name)

0394 / Shallow Depth Diving EQ

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
'FY25 Shallow Depth Diving Equipment Execution: DAVD / MK18 UUV Sensor Integration	1	2025	4	2025
'FY25 Shallow Depth Diving Equipment Execution: ANU Item Testing	1	2025	4	2025
'FY25 Shallow Depth Diving Equipment Execution: Submarine Rescue System (SRS) Modernization Program	1	2025	4	2028
'FY25 Shallow Depth Diving Equipment Execution: Microelectronics Redesign	1	2025	4	2027
'FY25 Shallow Depth Diving Equipment Execution: Condition Based Maintenance	2	2025	1	2026
'FY25 Shallow Depth Diving Equipment Execution: Electro-optic Sensors for Launch and Recovery	2	2025	1	2026
'FY25 Shallow Depth Diving Equipment Execution: Noise Abatement	1	2025	1	2026
'FY25 Shallow Depth Diving Equipment Execution: Pressurized Rescue Module (PRM) Atmospheric Sensing	2	2025	1	2026
'FY25 Shallow Depth Diving Equipment Execution: Anchor Handler Tug System (AHTS) Mobilization	2	2025	1	2026
'FY25 Shallow Depth Diving Equipment Execution: Oxygen Delivery and Monitoring System	1	2025	1	2026
FY26 Pre-Proposals Due	1	2025	1	2025
FY26 New Full Proposals Due	2	2025	3	2025
FY26 New Proposals Selected	3	2025	3	2025
'FY26 Shallow Depth Diving Equipment Execution: Diver Tracking Device Testing	1	2026	4	2026
'FY26 Shallow Depth Diving Equipment Execution: DAVD / MK18 UUV Sensor Integration	1	2026	4	2026
'FY26 Shallow Depth Diving Equipment Execution: ANU Item Testing	1	2026	4	2026
'FY26 Shallow Depth Diving Equipment Execution: MK29 Testing and Evaluation	1	2026	4	2026
'FY26 Shallow Depth Diving Equipment Execution: KM37 DP Integration Testing and Evaluation	1	2026	4	2026

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603713N / Ocean Engineering Tech D ev		Project (Number/Name) 0394 / Shallow Depth Diving EQ	
Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
'FY26 Shallow Depth Diving Equipment Execution: Submarine Rescue System (SRS) Modernization Program	1	2026	4	2028
'FY26 Shallow Depth Diving Equipment Execution: Microelectronics Redesign	1	2026	4	2027
'FY26 Shallow Depth Diving Equipment Execution: Electro-optic Sensors for Launch and Recovery	1	2026	1	2026
'FY26 Shallow Depth Diving Equipment Execution: Condition Based Maintenance	1	2026	1	2026
'FY26 Shallow Depth Diving Equipment Execution: Noise Abatement	1	2026	1	2026
'FY26 Shallow Depth Diving Equipment Execution: Pressurized Rescue Module (PRM) Atmospheric Sensing	1	2026	1	2026
'FY26 Shallow Depth Diving Equipment Execution: Anchor Handler Tug System (AHTS) Mobilization	1	2026	1	2026
'FY26 Shallow Depth Diving Equipment Execution: Oxygen Delivery and Monitoring System	1	2026	1	2026
'FY26 Shallow Depth Diving Equipment Execution: Electronic Breathing System (EBS) Hose Redesign	2	2026	1	2027
'FY26 Shallow Depth Diving Equipment Execution: Thru-Hull Communications	2	2026	1	2027
'FY26 Shallow Depth Diving Equipment Execution: Augmented Reality/Virtual Reality (AR/VR) Trainer	2	2026	1	2027
'FY26 Shallow Depth Diving Equipment Execution: Active Motion Heave Compensation	2	2026	4	2028
FY27 Pre-Proposals Due	1	2026	1	2026
FY27 New Full Proposals Due	2	2026	3	2026
FY27 New Proposals Selected	3	2026	3	2026
FY27 Shallow Depth Diving Equipment Execution: ANU Item Testing	1	2027	4	2027
FY27 Shallow Depth Diving Equipment Execution: MK29 Testing and Evaluation	1	2027	4	2027
FY27 Shallow Depth Diving Equipment Execution: KM37 DP Integration Testing and Evaluation	1	2027	4	2027

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603713N / <i>Ocean Engineering Tech Dev</i>		Project (Number/Name) 0394 / <i>Shallow Depth Diving EQ</i>
		Start		End
Events by Sub Project		Quarter	Year	Quarter
FY27 Shallow Depth Diving Equipment Execution: High Pressure Air & Oxygen Components		1	2027	4
FY27 Shallow Depth Diving Equipment Execution: Submarine Rescue System (SRS) Modernization Program		1	2027	4
FY27 Shallow Depth Diving Equipment Execution: Microelectronics Redesign		1	2027	4
FY27 Shallow Depth Diving Equipment Execution: Active Motion Heave Compensation		1	2027	4
FY28 Pre-Proposals Due		1	2027	1
FY28 New Full Proposals Due		2	2027	3
FY28 New Proposals Selected		3	2027	3
FY28 Shallow Depth diving Equipment Execution: ANU Item Testing		1	2028	4
FY28 Shallow Depth diving Equipment Execution: High Pressure Air & Oxygen Components		1	2028	4
FY28 Shallow Depth diving Equipment Execution: Contaminated Water Sensors		1	2028	4
FY28 Shallow Depth diving Equipment Execution: Submarine Rescue System (SRS) Modernization Program		1	2028	4
FY28 Shallow Depth diving Equipment Execution: Active Motion Heave Compensation		1	2028	4
FY29 Pre-Proposals Due		1	2028	1
FY29 New Full Proposals Due		2	2028	3
FY29 New Proposals Selected		3	2028	3

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy											Date: March 2023	
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603721N / Environmental Protection							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	475.716	28.150	21.647	24.457	-	24.457	24.448	24.775	25.239	25.730	Continuing	Continuing
0401: Shipboard Waste Mgmt	365.307	9.315	10.051	11.615	-	11.615	11.631	11.853	12.074	12.301	Continuing	Continuing
0817: Environmental Sustainability Development (NESDI)	68.891	5.359	5.197	6.010	-	6.010	5.986	5.959	6.077	6.199	Continuing	Continuing
2549: Environmental Restoration	0.000	7.550	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.550
9204: Marine Mammal Research	41.518	5.926	6.399	6.832	-	6.832	6.831	6.963	7.088	7.230	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program develops and evaluates processes, hardware, systems, operational procedures, scientific methods, and environmental studies that will allow the Navy to operate in U.S., foreign, and international waters, air, space, and land areas while complying with environmental laws, regulations, Executive Orders, policies and international agreements.

Many environmental laws, regulations, and policies impose restrictions on Navy training and testing, vessels, aircraft, and facilities that interfere with operations and/or increase the cost of operations. The Navy must be able to conduct its national security mission in compliance with applicable environmental requirements in the U.S. and abroad without compromising performance, safety, or health, while simultaneously minimizing the cost of compliance. The projects for this Program Element (PE) support the Navy's compliance with the (a) Clean Water Act; (b) Act to Prevent Pollution from Ships; (c) International Convention for the Prevention of Pollution from Ships; (d) DoD Manual 4715.06, "Regulations on Vessels Owned or Operated by the Department of Defense," Vol 1-4; (e) Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990; (f) National Invasive Species Act of 1996; (g) Ballast Water Management for Control of Nonindigenous Species in Waters of the United States; (h) Clean Air Act; (i) Federal Insecticide, Fungicide, and Rodenticide Act; (j) Marine Mammal Protection Act; (k) Endangered Species Act; (l) Comprehensive Environmental Response, Compensation, and Liability Act; and (m) Resource Conservation and Recovery Act. References (a) through (m) establish Level I environmental protection requirements. Project 0401, Shipboard Waste Management, supports efforts that enable Navy ships and submarines to comply with laws, regulations, and policies in six major areas: (1) Technical Authority, (2) Liquid Wastes, (3) Hazardous Material Control and Management, (4) Ballast Water Management, (5) Solid Waste Management, and (6) Copper-Free and Low Copper Antifouling.

The Marine Mammal Research (MMR) program is responsible for applied research and works to address the Navy's key research needs and transition the results and technologies for use within the Navy's at-sea environmental compliance and permitting processes in compliance with the Marine Mammal Protection Act and the Endangered Species Act, with the goals of improving marine species impact analysis (including marine mammal take estimates), mitigation measures and monitoring capabilities. Key points of the MMR mission are: (1) Improve the best available science regarding the potential impacts to marine species from Navy activities, (2) Expand the technology and methods available to the U.S. Navy marine species monitoring program (3) Preserve core Navy readiness capabilities. This funding allows the Navy to avoid or reduce the chances of costly litigation for non-compliance.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0603721N / Environmental Protection			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	20.677	21.647	22.770	-	22.770
Current President's Budget	28.150	21.647	24.457	-	24.457
Total Adjustments	7.473	0.000	1.687	-	1.687
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	7.550	0.000			
• SBIR/STTR Transfer	-0.077	0.000			
• Program Adjustments	0.000	0.000	1.249	-	1.249
• Rate/Misc Adjustments	0.000	0.000	0.438	-	0.438
Change Summary Explanation					
FY 2024 increase of (\$2.810) million is due to program adjustments for Shipboard Waste Management, Environmental Sustainability Development, and Marine Mammal Research.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>				Project (Number/Name) 0401 / <i>Shipboard Waste Mgmt</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0401: <i>Shipboard Waste Mgmt</i>	365.307	9.315	10.051	11.615	-	11.615	11.631	11.853	12.074	12.301	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Navy ships and submarines must routinely operate in U.S., international, and foreign waters, and visit numerous U.S. and foreign ports. No body of water is without environmental restrictions that impact the movements and operations of Navy vessels. Environmental requirements tend to be most restrictive in port and in coastal waters, where the Navy's increasing littoral presence places ships and submarines in discharge-restricted waters for longer periods of time. Growing international cooperation in addressing global environmental concerns is resulting in expanding areas of ocean considered environmentally susceptible, where special prohibitions on ship discharges and operations are imposed. Navy vessels must comply with applicable environmental legal requirements while maintaining continued access to all waters for operations, exercises, training, and port access. The large crews and limited on-board space of Navy ships and submarines severely constrain their ability to hold wastes for return to port for shore side disposal.

Many environmental laws, regulations, and policies impose restrictions on Navy training and testing, vessels, aircraft, and facilities that interfere with operations and/or increase the cost of operations. The Navy must be able to conduct its national security mission in compliance with applicable environmental requirements in the U.S. and abroad without compromising performance, safety, or health, while simultaneously minimizing the cost of compliance. The projects for this Program Element (PE) support the Navy's compliance with the (a) Clean Water Act; (b) Act to Prevent Pollution from Ships; (c) International Convention for the Prevention of Pollution from Ships; (d) DoD Manual 4715.06, "Regulations on Vessels Owned or Operated by the Department of Defense," Vol 1-4; (e) Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990; (f) National Invasive Species Act of 1996; (g) Ballast Water Management for Control of Nonindigenous Species in Waters of the United States; (h) Clean Air Act; (i) Federal Insecticide, Fungicide, and Rodenticide Act; (j) Marine Mammal Protection Act; (k) Endangered Species Act; (l) Comprehensive Environmental Response, Compensation, and Liability Act; and (m) Resource Conservation and Recovery Act. References (a) through (m) establish Level I environmental protection requirements. Project 0401, Shipboard Waste Management, supports efforts that enable Navy ships and submarines to comply with laws, regulations, and policies in six major areas: (1) Technical Authority, (2) Liquid Wastes, (3) Hazardous Material Control and Management, (4) Ballast Water Management, (5) Solid Waste Management, and (6) Copper-Free and Low Copper Antifouling.

The Afloat Environmental Quality Program supports the designated Technical Warrant Holders for Environmental Systems & Materials Engineering, with responsibility and accountability for ensuring that ships and submarines are designed and upgraded, and can be operated, in compliance with existing and anticipated environmental requirements while minimizing total ownership cost and manning. This responsibility encompasses legacy platforms and new vessel designs, as well as Fleet operations exercises, and training.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Technical Authority	1.555	1.584	1.584	0.000	1.584
Articles:	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603721N / Environmental Protection		Project (Number/Name) 0401 / Shipboard Waste Mgmt		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Description: Funding in support of Technical Authority (TA) is utilized to develop waste stream design criteria and guidance. This includes system/technology selection, processing capacity, interfaces, shipboard integration, test and qualification protocols, processes and practices, performance specifications, and development of ship requirement packages for various waste streams.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none">- Continue to update the Ship Oil Spill Database, analyze oil spill root causes and identify policy/training/hardware deficiencies to reduce oil discharges/violations.- Draft USS San Antonio Class (LPD-17 Class) ship specific guidance on oil spill prevention and response to reduce ship oil spill discharge violations.- Continue evaluation of most promising commercial hull cleaning technologies to determine future system feasibility to meet Uniform National Discharge Standards (UNDS) requirements.- Continue to work with Fleet, acquisition programs, and technical authorities to review and provide comments on issues, risks, and opportunities so as minimize the cost and risk to the Navy.- Continue meetings with the North Atlantic Treaty Organization (NATO) and foreign Navy data exchange partners to leverage lessons learned on afloat environmental compliance.- Continue development of environmental equipment/system requirements documentation, design criteria/guidance, standards, and certification protocols based on evolving regulations and policy.- Continue to perform annual assessments of emergent air and water emission processes and technologies to enable effective compliance at minimal life cycle cost and risk to operations. <p>FY 2024 Base Plans:</p> <ul style="list-style-type: none">- Continue to update the Ship Oil Spill Database, analyze oil spill root causes and identify policy/training/hardware deficiencies to reduce oil discharges/violations.- Publish LPD-17 Class ship specific guidance on oil spill prevention and response to reduce ship oil spill discharge violations.- Continue to work with Fleet, acquisition programs, and technical authorities to review and provide comments on issues, risks, and opportunities so as minimize the cost and risk to the Navy.- Continue meetings with NATO and foreign Navy data exchange partners to leverage lessons learned on afloat environmental compliance.- Continue development of environmental equipment/system requirements documentation, design criteria/guidance, standards, and certification protocols based on evolving regulations and policy.						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>		Project (Number/Name) 0401 / <i>Shipboard Waste Mgmt</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Continue to perform annual assessments of emergent air and water emission processes and technologies to enable effective compliance at minimal life cycle cost and risk to operations.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: No change in funding.						
Title: Liquid Wastes		2.781	2.781	3.000	0.000	3.000
Articles:		-	-	-	-	-
Description: This effort addresses liquid wastes in two (2) major areas: Oil Pollution Abatement and Non-Oily Waste. Funding will be utilized to assess new commercial off-the-shelf (COTS), modified COTS, and developmental products and technologies for application to Navy ships and submarines. The funding will also be utilized to develop and demonstrate detailed system and performance specifications and design guidance for the acquisition of cost effective shipboard liquid waste management solutions that meet existing and anticipated environmental requirements within the constraints of shipboard performance, reliability, and warship-unique requirements. In addition, the effort will seek common solutions across platforms, and where possible, across the Fleet to provide lifecycle cost savings, logistical efficiency, and improved Fleet familiarity.						
FY 2023 Plans: Continue assessments of emergent COTS Marine Pollution Control processes and technologies that would enable effective compliance at minimal life cycle cost and risk to operations. Identify systems for detailed acquisition and evaluation						
Oil Pollution Abatement: - Continue shipboard evaluation of a commercial centrifugal OWS. - Initiate Ship Change Document (SCD) for centrifugal OWS implementation - Develop contract package for centrifugal OWS procurement to support transition to Fleet implementation - Identify and procure candidate submersible pumps for laboratory testing - Develop test plan for submersible pump laboratory evaluation. - Complete ASTM testing to evaluate cleaning efficacy of selected bilge cleaners - Establish requirements for bilge cleaners based on results of testing. - Conduct environmental tests (i.e., shock, vibration, electromagnetic interference (EMI) tests) of a Oil Content Monitor (OCM) that utilizes UV-fluorescence detection technology.						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603721N / Environmental Protection		Project (Number/Name) 0401 / Shipboard Waste Mgmt	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Non-Oily Waste:</p> <ul style="list-style-type: none">- Continue laboratory evaluation of alternative vacuum pumps.- Develop test plan for laboratory evaluation of pressed fittings.- Prepare for laboratory evaluation of pressed fittings.- Begin evaluation of effects of periodicity changes to pipe scale prevention product application on DDGs.- Conduct environmental tests (i.e., shock, vibration, and EMI tests) of hydrogen sulfide (H2S) detectors.- Review previous testing of sanitary fixture cleaners- Develop plan for laboratory testing of sanitary fixture cleaners- Conduct laboratory testing of sanitary fixture cleaners. <p>FY 2024 Base Plans:</p> <p>Oil Pollution Abatement:</p> <ul style="list-style-type: none">- Continue shipboard evaluation of centrifugal OWS- Develop Integrated Logistics Support (ILS) for centrifugal OWS implementation- Demonstrate membrane regeneration software end evaluate alternate membrane cleaners- Identify oil water separators for small ships to support next generation Modified Off the Shelf (MOTS) OPA technology evaluations- Conduct laboratory evaluation of submersible pumps- Develop and issue bilge cleaner RFI- Evaluate responses to bilge cleaner RFI- Develop draft bilge cleaner CID- Determine suitability of alternative transfer pumps- Develop transfer pump test protocol and strategy <p>Non-Oily Waste:</p> <ul style="list-style-type: none">- Complete laboratory evaluation of alternative vacuum pumps- Begin laboratory evaluation of pressed fittings- Continue evaluation of effects of pipe scale prevention product application periodicity changes on DDGs- Develop CID for hydrogen sulfide detectors <p>FY 2024 OCO Plans:</p> <p>N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603721N / Environmental Protection		Project (Number/Name) 0401 / Shipboard Waste Mgmt		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
FY24 increase (\$0.219M) supports conducting three (3) significant laboratory evaluations (alternative vacuum pump completion, pressed fittings, and submersible pumps) while continuing two (2) shipboard evaluations (pipe scale prevention product application periodicity changes and centrifugal OWS).						
Title: Hazardous Material Control and Management		0.900	0.900	0.900	0.000	0.900
Articles:		-	-	-	-	-
Description: A wide variety of Hazardous Materials (HM) are used to construct, operate and maintain Navy ships and submarines. These HMs include cleaning compounds, solvents, adhesives, sealants, corrosion preventive compounds, acids, alkalis, oxidizers, lubricants, functional fluids, and many other products. Hazardous Material Control and Management (HMC&M) addresses environmental, safety, and health risks to ship construction workers, Ship's Force (S/F), and shipyard workers.						
FY 2023 Plans:						
- Continue assessments of emergent COTS HM management processes and pollution prevention technologies that would enable effective compliance at minimal life cycle cost and risk to operations.						
- Continue to identify HM control and pollution prevention systems for detailed acquisition and evaluation.						
- Continue to assess less hazardous or non-hazardous substitutes for high-risk HM regulated under the Toxic Substance Control Act (TSCA).						
- Continue identifying and implementing alternatives to known human carcinogens (KHC)						
FY 2024 Base Plans:						
- Continue assessments of emergent COTS HM management processes and pollution prevention technologies that would enable effective compliance at minimal life cycle cost and risk to operations.						
- Continue to identify HM control and pollution prevention systems for detailed acquisition and evaluation.						
- Continue to assess less hazardous or non-hazardous substitutes for high-risk HM regulated under TSCA.						
- Continue to identify and implement alternatives to KHC						
FY 2024 OCO Plans:						
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement:						
No change in funding.						
Title: Solid Waste Management		1.100	1.291	2.276	0.000	2.276
Articles:		-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603721N / Environmental Protection		Project (Number/Name) 0401 / Shipboard Waste Mgmt		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Description: Solid Waste Management (SWM) supports the Act to Prevent Pollution from Ships (APPS), which regulates all garbage discharges from ships at sea.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none">- Continue to evaluate innovative SWM processes and technologies for surface ships and submarines that would enable effective compliance at minimal life cycle cost and risk to operations.- Continue to perform shipboard evaluation of waste processing equipment for special solid waste (e.g., Feminine Hygiene Products, Pilot Urine bags, etc.) on large ship.- Modify waste processing equipment for special solid waste based on SHIPEVAL results. <p>FY 2024 Base Plans:</p> <ul style="list-style-type: none">- Continue to evaluate innovative SWM processes and technologies for surface ships and submarines that would enable effective compliance at minimal life cycle cost and risk to operations.- Conduct Navy ship environmental testing of Navy Prototype solid waste system.- Perform evaluation of waste processing equipment for special solid waste (e.g., Feminine Hygiene Products, Pilot Urine bags, etc.) sized for medium ship. <p>FY 2024 OCO Plans:</p> <p>N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p> <p>FY24 increase (\$0.985M) due to installation costs and documentation related to shipboard evaluation of Navy prototype solid waste system for next generation plastic waste processors, and procurement of special solid waste processing equipment for laboratory evaluation.</p>						
<p>Title: Ballast Water Management</p> <p>Articles:</p> <p>Description: The National Invasive Species Act of 1996 (NISA) requires the Secretary of Defense to implement a Ballast Water Management (BWM) program to minimize the risk of introduction of non-indigenous species (NIS) and pathogens from releases of ballast water from seagoing vessels of the DoD.</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none">- Continue assessments of emergent COTS electro-chlorination and ultraviolet (UV) based ballast water treatment systems (BWTs) that would enable effective compliance at minimal life cycle cost and risk to operations.- Finalize fabrication of a modified compact-sized commercial UV BWTS.		2.737 -	3.245 -	3.623 -	0.000 -	3.623 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603721N / Environmental Protection		Project (Number/Name) 0401 / Shipboard Waste Mgmt		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div>- Test the modified compact-sized commercial UV BWTS performance in a shipboard environment.</div> <div>- Perform shock, vibration, and electromagnetic testing of the modified compact-sized commercial UV BWTS.</div> <div>- Begin fabrication of a modified standard-sized commercial UV BWTS.</div> <div>FY 2024 Base Plans:</div> <div>- Continue assessments of emergent COTS electro-chlorination and UV based BWTSs that would enable effective compliance at minimal life cycle cost and risk to operations.</div> <div>- Incorporate all modifications required on the modified compact-sized commercial UV BWTS into a technical data package based on operational and military standard tests to finalize the design for future in-service procurements.</div> <div>- Finalize fabrication of a modified standard-sized commercial UV BWTS.</div> <div>- Initiate operational, shock, vibration, and electromagnetic tests of the modified standard-sized commercial UV BWTS.</div> <div>FY 2024 OCO Plans:</div> <div>N/A</div> <div>FY 2023 to FY 2024 Increase/Decrease Statement:</div> <div>FY24 increase (\$0.378M) supports the testing of the modified standard-sized commercial UV based BWTS. Due to the standard-size system size and flow rates required for larger vessels, specialty testing platforms will be required to accomplish testing planned.</div>						
<div>Title: Copper-Free and Low Copper Antifouling</div> <div>Articles:</div> <div>Description: The copper discharges from underwater hull coatings remain a regulatory concern. The effort focuses on characterizing advanced coating systems (copper-containing, copper-free, and low copper) and their suitability for Navy-unique operational factors such as speed time profiles, drydocking intervals, and maintenance practices. The biofouling pressure at Navy homeports is also being characterized in order to inform hull and, especially, propeller cleaning scheduling.</div> <div>FY 2023 Plans:</div> <div>- Monitor test band coating system performance on DDG-51 Class ship.</div> <div>- Continue evaluation of performance of advanced coating systems.</div> <div>- Continue assessing emergent commercial antifouling coatings.</div> <div>- Continue biofouling pressure surveys of Naval Station Norfolk and Joint Expeditionary Base Little Creek.</div>		0.242 -	0.250 -	0.232 -	0.000 -	0.232 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>		Project (Number/Name) 0401 / <i>Shipboard Waste Mgmt</i>	
<u>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</u>					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Initiate biofouling pressure surveys to Naval Station San Diego and Naval Station Mayport. <i>FY 2024 Base Plans:</i> - Preliminary report on test band coating system performance on DDG-51 Class ship. - Continue evaluation of performance of test band coating system performance on DDG-51 Class ship. - Continue assessing emergent commercial antifouling coatings. - Continue biofouling pressure surveys of Naval Station San Diego and Naval Station Mayport - Initiate evaluation of aged coatings: biocide leaching, effectiveness, and environmental impact. <i>FY 2024 OCO Plans:</i> N/A <i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> FY24 decrease (\$0.018M) due to completion of installation of test band on DDG-51 Class ship.					
Accomplishments/Planned Programs Subtotals	9.315	10.051	11.615	0.000	11.615
<u>C. Other Program Funding Summary (\$ in Millions)</u>					
N/A					
<u>Remarks</u>					
<u>D. Acquisition Strategy</u>					
RDT&E Contracts are Competitive Procurements.					

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603721N / Environmental Protection						Project (Number/Name) 0401 / Shipboard Waste Mgmt			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Ancillary Hardware Development	Various	Misc. Contracts : Not Specified	19.149	0.000		0.000		0.000		-		0.000	0.000	19.149	Continuing
Primary Hardware Development	C/CPFF	Oceaneering : Not Specified	1.000	0.000		0.000		0.000		-		0.000	0.000	1.000	Continuing
Systems Engineering	C/CPFF	John J. McMullen & Son : Not Specified	4.487	0.000		0.000		0.000		-		0.000	0.000	4.487	Continuing
Subtotal			24.636	0.000		0.000		0.000		-		0.000	0.000	24.636	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	WR	SPAWAR : Charleston, SC	10.838	0.000		0.000		0.000		-		0.000	0.000	10.838	Continuing
Subtotal			10.838	0.000		0.000		0.000		-		0.000	0.000	10.838	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NSWCCD, Bethesda, MD : Bethesda, MD	242.384	7.312	Oct 2021	7.776	Oct 2022	8.870	Oct 2023	-		8.870	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NRL,Wash,DC : Wash,DC	34.124	0.163	Oct 2021	0.050	Oct 2022	0.050	Oct 2023	-		0.050	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NSWCPD, Philadelphia, PA : Philadelphia, PA	1.972	1.217	Oct 2021	1.300	Oct 2022	1.770	Oct 2023	-		1.770	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	SPAWARSYSCEN : SD,CA	12.308	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	Misc. Govt Labs : TBD	23.780	0.100	Mar 2022	0.100	Oct 2022	0.100	Oct 2023	-		0.100	0.000	24.080	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603721N / Environmental Protection				Project (Number/Name) 0401 / Shipboard Waste Mgmt					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	C/CPFF	Misc. Contracts : TBD	14.453	0.500	Mar 2022	0.500	Oct 2022	0.500	Oct 2023	-		0.500	0.000	15.953	-
Subtotal			329.021	9.292		9.726		11.290		-		11.290	Continuing	Continuing	N/A
Remarks															
Increased funding to NSWCCD for Ballast Water Management (BWM) tasking related to testing of both commercial and modified commercial BWTSS; for identification and testing of Capture and Clean Hull Cleaning Technology; and to investigate and spearhead design, integration and testing of innovative solid waste equipment. FY20 and 21 Miscellaneous Contract funding for BWM and Hull Cleaning Technology to be identified in FY20.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Allot	NAVSEA HQ : Washington, DC	0.385	0.023	Oct 2021	0.025	Oct 2022	0.025	Oct 2023	-		0.025	Continuing	Continuing	Continuing
SBIR Assessment	Allot	ONR : Not Specified	0.427	0.000	Oct 2021	0.300	Oct 2022	0.300	Oct 2023	-		0.300	0.000	1.027	Continuing
Subtotal			0.812	0.023		0.325		0.325		-		0.325	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			365.307	9.315		10.051		11.615		-		11.615	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																Date: March 2023			
Appropriation/Budget Activity								R-1 Program Element (Number/Name)								Project (Number/Name)			
1319 / 4								PE 0603721N / Environmental Protection								0401 / Shipboard Waste Mgmt			

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
SHIPBOARD WASTE MANAGEMENT																												
Technical Authority																												
Liquid Wastes																												
Hazardous Material Control and Management																												
Ballast Water Management																												
Solid Waste Management																												
Copper-Free and Low Copper Antifouling																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 0401 / <i>Shipboard Waste Mgmt</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
SHIPBOARD WASTE MANAGEMENT				
Technical Authority	1	2022	4	2028
Liquid Wastes	1	2022	4	2028
Hazardous Material Control and Management	1	2022	4	2028
Ballast Water Management	1	2022	4	2028
Solid Waste Management	1	2022	4	2028
Copper-Free and Low Copper Antifouling	1	2022	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603721N / Environmental Protection				Project (Number/Name) 0817 / Environmental Sustainability Development (NESDI)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0817: Environmental Sustainability Development (NESDI)	68.891	5.359	5.197	6.010	-	6.010	5.986	5.959	6.077	6.199	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The vision outlined in "A Design for Maintaining Maritime Superiority, Version 2.0" (December 2017) and "2018 National Defense Strategy of the United States of America" is for our Navy to become more lethal, resilient and a rapidly innovating joint force. We must maintain a fleet that is trained ready to operate and fight decisively. Today's reality requires training and operating within environmental constraints (national and international laws and agreements) and searching for alternatives to comply with and alleviate those constraints. Moreover, as we develop new systems and technologies in support of the National Defense Strategy, the Navy must anticipate and address potential environmental constraints which could in the future adversely impact our ability to protect and sustain our forces at home and abroad.

This program identifies pervasive Navy shore side environmental requirements and develops and validates information, new processes, and technologies that address requirements that pose significant impact on Naval shore activities in complying with environmental laws, regulations, orders, and policies. The goal of the program is to maximize opportunities for significant cost savings while minimizing personnel liabilities, operational costs, and regulatory oversight and preserving or enhancing the ability of Naval shore activities to accomplish their required missions and functions in support of the Navy's transformational strategy.

Environmental Enabling Capabilities -2 (EEC-2) MAXIMIZE TRAINING AND TESTING RANGE REQUIREMENTS WITHIN ENVIRONMENTAL CONSTRAINTS: This capability addresses environmental impacts and restrictions at Navy land and sea ranges, including munitions testing and manufacturing, to ensure Navy ranges are available to conduct required training and testing operations for the Fleet. Investments in EEC-2 provide validated knowledge, models, and processes to mitigate environmental impacts, restrictions, and costs at Navy training and test ranges to maximize the availability and utilization of the ranges. The results support operational readiness by providing the tools and technologies necessary for sustaining and managing Navy land and sea ranges related to unexploded ordnance (UXO) and munitions, encroachment, air quality, airborne noise, water quality, and wetlands. Capabilities gained include the ability to assess and determine the risks from underwater UXO, the evaluation and prioritization of ordnance contaminated sites for evaluation in environmental programs and the implementation of range specific best management practices by evaluating and modeling available process, procedures, and technologies.

Environmental Enabling Capabilities-3 (EEC-3) PLATFORM MAINTENANCE AND REPAIR WITH MINIMAL ENVIRONMENTAL FOOTPRINT: This capability focuses on minimizing or eliminating environmental impact related to Navy and Marine Corps weapon system repair and maintenance operations. Investments in EEC-3 provide valid knowledge, models, processes, and technologies to minimize regulated emissions, discharges and hazardous material usage during the repair and maintenance of ships, submarines, and surface/sub-surface vehicles and aircraft and air vehicles. The program supports Fleet operational readiness and Navy acquisition communities by investing in information to understand emerging environmental requirements and to develop innovative processes and technologies that result in savings while reducing the fleet environmental constraints related to platform maintenance. Capabilities and benefits gained include, but are not limited to, the reduction in the usage of heavy metals used in metal finishing (chromium and cadmium), reduced hazardous air pollutant (HAP) emissions, the development of best management practices

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / Environmental Protection	Project (Number/Name) 0817 / Environmental Sustainability Development (NESDI)				
and tools to minimize the use of hazardous materials, and the generation of hazardous wastes associated with maintaining and repairing ships, submarines, aircraft, and unmanned vehicles. Results of program investments will be leveraged across weapon system and platform acquisition to ensure continued reduction in lifecycle costs and long-term environmental compliance burdens to the Fleet.						
Environmental Enabling Capabilities-4 (EEC-4). SUPPORT SHORE READINESS WITHIN ENVIRONMENTAL CONSTRAINTS: Naval shore establishment requires the capability to operate and maintain facilities and provide waterfront and airfield services to the fleet while complying with applicable environmental regulations and minimizing environmental impacts and costs. The program invests in knowledge and innovative processes and technologies that minimize infrastructure and operational costs, regulated emissions, while minimizing discharges and hazardous material usage from ship (waterfront) and aviation operations. Capabilities and benefits gained under EEC-4 include, reduced costs associated with wastewater treatment, elimination/reduction in the use of HAPs, ozone depleting substances (ODSs), volatile organic compounds (VOCs) and the associated reporting requirements, reduced hazardous waste and disposal costs, and improved storm water management.						
Environmental Enabling Capabilities-5 (EEC-5). COST-EFFECTIVE MANAGEMENT OF ENVIRONMENTAL REGULATORY REQUIREMENTS: The environmental compliance regulations require base managers to permit, monitor and report on many processes associated with weapon system and platform operations. Naval shore environmental managers require the capability to efficiently and cost effectively manage these compliance requirements. Under EEC-5, the program invests in improved data collection, methods, and models to assess environmental impacts and ecological risk assessments of Naval Operations on harbors, U.S. waterways, and surrounding communities. Benefits include gaining standardized technical environmental management improvements/techniques related to source control, assessment, and monitoring. EEC-5 also provides validated knowledge, models, processes and technologies to improve environmental monitoring and reporting, and to reduce the cost of compliance with regulations applicable to coastal contamination and contaminated sediments.						
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: EEC-2,Maximize Training & Testing Requirements Within Environmental Constraints		0.665	0.357	0.357	0.000	0.357
Articles:		-	-	-	-	-
FY 2023 Plans:						
- Continue providing validated knowledge, models, and processes to mitigate environmental impacts, restrictions, and costs of Navy training and test ranges to maximize the availability and utilization of the ranges.						
- Continue Integrated Analytical Approach to Transition from Active to Passive Treatments at Munitions Sites.						
- Complete demonstration of Robust Caisson Structure to Reduce Blast Effects from Underwater Blow-In-Place.						
FY 2024 Base Plans:						
- Continue providing validated knowledge, models, and processes to mitigate environmental impacts, restrictions, and costs of Navy training and test ranges to maximize the availability and utilization of the ranges.						
- Complete Integrated Analytical Approach to Transition from Active to Passive Treatments at Munitions Sites.						
FY 2024 OCO Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603721N / Environmental Protection		Project (Number/Name) 0817 / Environmental Sustainability Development (NESDI)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: No change in funding.						
Title: EEC-3,Platform Maintenance and Repair With Minimal Environmental Footprint		1.395	1.490	1.606	0.000	1.606
Articles:		-	-	-	-	-
FY 2023 Plans: -Continue evaluations and demonstrations of innovative solutions for difficult and persistent aviation and shipyard platform sustainment issues related to hexavalent chrome, cadmium, volatile organic compounds (VOC) hazardous air pollutants (HAP) and other hazardous compounds at Naval Aviation Systems Command Fleet Readiness Centers and the Navy's shipyards. - Continue development and implementation of Methods to Reduce Sealant Waste in Fleet/Depot Level Operations, Advanced Anodize Repair. - Complete Dry Ice Paint Removal and Cleaning, Chrome-free, Low-VOC and Fast-drying Single- and Two-component Primers, Minimizing Hazardous Waste from Expired Paints and Associated Solvents from Ships Supply.						
FY 2024 Base Plans: - Continue evaluations and demonstrations of innovative solutions for difficult and persistent aviation and shipyard platform sustainment issues related to hexavalent chrome, cadmium, volatile organic compounds (VOC) hazardous air pollutants. - Continue Advanced Anodize Repair. - Complete Development and Implementation of Methods to Reduce Sealant Waste in Fleet/Depot Level Operations.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: FY24 increase (\$0.116M) supports additional costs of Methods to Reduce Sealant Waste in Fleet/Depot Level Operations and Advance Anodize Repair.						
Title: EEC-4, Support Shore Readiness within Environmental Constraints		1.531	1.510	1.699	0.000	1.699
Articles:		-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023				
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603721N / Environmental Protection	Project (Number/Name) 0817 / Environmental Sustainability Development (NESDI)				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>FY 2023 Plans:</p> <p>- Continue evaluations and demonstrations of innovative solutions to minimize regulated emissions, discharges and hazardous material usage resulting specifically from waterfront support, aviation support, and other base operations.</p> <p>- Continue Detection Methodology and Treatment Train Technology for PFAS Removal in Bilge and Oily Wastewater (BOW),Real-Time Multi-Contaminant Detection System (RMDS), Characterization of Antifouling Paint and Environmental Loading with Navy Dome System (CHROME DOME).</p> <p>- Complete Developing Lines of Evidence to Support Nutrient Compliance at Navy shipyards, Remotely Operated Oil Spill Response Equipment: Down-Selection and Demonstration at a Navy Port, Effluent Copper Quantification by Optical or Voltammetric Detection and Analysis, Locating and Quantifying Groundwater Surface Water Connections Using Distributed Temperature Sensing.</p> <p>FY 2024 Base Plans:</p> <p>- Continue evaluations and demonstrations of innovative solutions to minimize regulated emissions, discharges and hazardous material usage resulting specifically from waterfront support, aviation support, and other base operations.</p> <p>- Continue Characterization of Antifouling Paint and Environmental Loading with Navy Dome System (CHROME DOME).</p> <p>- Complete Detection Methodology and Treatment Train Technology for PFAS Removal in Bilge and Oily Wastewater (BOW), Real-Time Multi-Contaminant Detection System (RMDS).</p> <p>FY 2024 OCO Plans:</p> <p>N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p> <p>FY24 increase (\$0.189M) supports the additional costs of Characterization of Antifouling Paint and Environmental Loading with Navy Dome System (CHROME DOME), and Detection Methodology and Treatment Train Technology for PFAS Removal in Bilge and Oily Wastewater (BOW), Real-Time Multi-Contaminant Detection System (RMDS).</p>							
<p>Title: EEC-5,Cost-Effective Management of Environmental Regulatory Requirements</p> <p>Articles:</p> <p>FY 2023 Plans:</p>			1.768 -	1.840 -	2.348 -	0.000 -	2.348 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023				
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603721N / Environmental Protection	Project (Number/Name) 0817 / Environmental Sustainability Development (NESDI)				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div>- Continue providing validated knowledge, models, processes and systems to improve environmental monitoring and reporting, and reduce the cost of compliance with regulations and management of coastal contamination and contaminated sediments</div> <div>- Continue Chronic toxicity and bioaccumulation evaluation of multiple PFAS for benthic and pelagic species relevant to marine ecological risk assessment, Closed Loop, In Situ Soil Flushing at PFAS-Impacted Source Zones, An Integrated Navy Approach to Estimate Risk and Cleanup Goals for Radionuclides Associated with Buildings at Current and Former Navy Installations</div> <div>- Complete Demonstrating the Use of a Novel, Hybrid Polyelectrolyte/Hydrophilic Polymer for In situ PFAS Treatment Applications, Low-profile Integrated Porous Pretreatment Swale (LIPPS) for Metals Treatment in Industrial Areas, Rapid Pathogen Detection in Drinking and Surface Waters, Evaluating potential effects to marine biota from small-scale, legacy radioactive objects, Demonstration and Application of Amendments Targeting Comingled Organics and Metals in Sediments, Initiation Decision Report (IDR) for Addressing Opportunistic Premise Plumbing Pathogens at Navy Installations</div> <div>FY 2024 Base Plans:<div>- Continue providing validated knowledge, models, processes and systems to improve environmental monitoring and reporting, and reduce the cost of compliance with regulations and management of coastal contamination and contaminated sediments</div><div>- Continue Chronic toxicity and bioaccumulation evaluation of multiple PFAS for benthic and pelagic species relevant to marine ecological risk assessment, Closed Loop, In Situ Soil Flushing at PFAS-Impacted Source Zones</div><div>- Complete An Integrated Navy Approach to Estimate Risk and Cleanup Goals for Radionuclides Associated with Buildings at Current and Former Navy Installations</div></div> <div>FY 2024 OCO Plans:<div>N/A</div></div> <div>FY 2023 to FY 2024 Increase/Decrease Statement:<div>FY24 increase (\$0.508) supports additional costs of bioaccumulation evaluation of multiple PFAS for benthic and pelagic species relevant to marine ecological risk assessment, Closed Loop, In Situ Soil Flushing at PFAS-Impacted Source Zones.</div></div>							
Accomplishments/Planned Programs Subtotals			5.359	5.197	6.010	0.000	6.010

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 0817 / <i>Environmental Sustainability Development (NESDI)</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy This project is categorized as Non-ACAT (Non Acquisition). The project delivers a broad spectrum of products that require a variety of acquisition processes to implement. Equipment products for naval stations and other mission funded activities are often procured directly through the base operating budget. Equipment products for Shipyards and other Navy Working Capital Fund (NWCF) activities costing over \$250K are procured through their Capital Investment Program (CIP). For both types of activities, equipment products costing less than \$250K, and process changes not requiring the purchase of new equipment such as consumable material or product substitutions, are funded through the activity's operating budgets. Occasionally there is a technology that must be implemented as a specialized facility. These are acquired through the Military Construction (MILCON) Program. All these acquisition processes are pursued using a common strategy that satisfies the needs of all the critical stakeholders: 1) fleet end user; 2) funding sponsor for the Navy end user; 3) other stakeholders with cognizance over the Navy process or operation being changed, 4) cognizant environmental federal, state, and local regulators; and 5) the private or government organization that will produce the product.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>				Project (Number/Name) 0817 / <i>Environmental Sustainability Development (NESDI)</i>					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
EEC 2	Various	EXWC : PT HUENEME, CA	7.918	0.350	Oct 2021	0.357	Oct 2022	0.357	Oct 2023	-		0.357	Continuing	Continuing	Continuing
EEC 2	Various	SSC : SAN DIEGO, CA	7.184	0.315	Dec 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
EEC 3	WR	NAWC : PATUXENT RIVER, MD	2.698	0.130	Mar 2022	0.130	Mar 2023	0.130	Mar 2024	-		0.130	Continuing	Continuing	Continuing
EEC 3	Various	NSWC : BETHESDA, MD	4.614	0.175	Feb 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
EEC 3b	Various	EXWC : PT HUENEME, CA	1.768	0.160	Mar 2022	0.160	Mar 2023	0.160	Mar 2024	-		0.160	Continuing	Continuing	Continuing
EEC 4	Various	EXWC : PT HUENEME, CA	10.320	0.701	Mar 2022	0.670	Mar 2023	0.680	Mar 2024	-		0.680	Continuing	Continuing	Continuing
EEC 4	Various	NSWC : BETHESDA, MD	5.426	0.065	Nov 2021	0.065	Nov 2022	0.100	Nov 2023	-		0.100	Continuing	Continuing	Continuing
EEC 4a	Various	NIWC : SAN DIEGO, CA	5.283	0.765	Apr 2022	0.775	Feb 2023	0.919	Feb 2024	-		0.919	Continuing	Continuing	Continuing
EEC 5	Various	EXWC : PT HUENEME, CA	5.829	0.535	Oct 2021	0.600	Oct 2022	0.830	Oct 2023	-		0.830	Continuing	Continuing	Continuing
EEC 5	Various	NIWC : SAN DIEGO, CA	3.669	0.643	Oct 2021	0.730	Oct 2022	1.005	Oct 2023	-		1.005	Continuing	Continuing	Continuing
EEC 5	Various	NAWC : PATUXENT RIVER, MD	1.702	0.115	Jun 2022	0.115	Jun 2023	0.115	Jun 2024	-		0.115	Continuing	Continuing	Continuing
EEC 5	Various	NSWC : BETHESDA, MD	3.731	0.165	Jan 2022	0.060	Jan 2023	0.061	Jan 2024	-		0.061	Continuing	Continuing	Continuing
EEC 5	WR	NAWCWD : CHINA LAKE, CA	1.982	0.185	Dec 2021	0.185	Dec 2022	0.187	Dec 2023	-		0.187	Continuing	Continuing	Continuing
EEC 5	WR	NAWC : LAKE HURST, NJ	1.221	0.125	Nov 2021	0.150	Nov 2022	0.150	Nov 2023	-		0.150	Continuing	Continuing	Continuing
EEC 3	WR	FRC - SE : JACKSONVILLE, FL	3.350	0.635	May 2022	0.635	May 2023	0.721	May 2024	-		0.721	Continuing	Continuing	Continuing
EEC 3	Various	NSWC : San Diego, CA	0.060	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603721N / Environmental Protection				Project (Number/Name) 0817 / Environmental Sustainability Development (NESDI)					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
EEC 3	WR	FRC - CE : Cherry Point, NC	0.715	0.100	Jun 2022	0.100	Jun 2023	0.100	Jun 2024	-		0.100	Continuing	Continuing	Continuing
EEC 3	Various	FRC-SW : San Diego, CA	1.421	0.195	Mar 2022	0.195	Mar 2023	0.195	Mar 2024	-		0.195	Continuing	Continuing	Continuing
EEC 3	WR	NRL : Washington DC	0.000	0.000		0.270	Feb 2023	0.300	Feb 2024	-		0.300	Continuing	Continuing	Continuing
Subtotal			68.891	5.359		5.197		6.010		-		6.010	Continuing	Continuing	N/A
Remarks															
Performing Activities: Naval Surface Warfare Center, Carderock Division (NSWC/CD); Engineering and Expeditionary Warfare Center (EXWC), Port Hueneme, CA; Naval Surface Warfare Center, Indian Head Division (NSWC/IH); Space and Warfare Systems Center, San Diego (NIWC/SD); Naval Air Warfare Center Aircraft Division Patuxent River (NAWCAD/PAX); Naval Air Warfare Center (NAWCWD/China Lake); Naval Air Warfare Center Aircraft Division Lakehurst (NAWCAD/Lakehurst); Fleet Readiness Center Southeast, Jacksonville FL (FRC-SE); Fleet Readiness Center Southwest, San Diego (FRC-SW), Fleet Readiness Center East, Cherry Point (FRC-CE). Total Prior Years Cost: Subtotal does not include performing activities from prior years that are no longer performing activities. Award Dates: About 55% of the project is executed via contracts awarded by the performing activities. More rigorous contracting, funding and performer work induction processes are slightly increasing project management costs. Contracting and financial management offices across the performing organizations may be understaffed. Projects are derived from field level needs and awarded competitively to performing organizations, the portfolio mix of cost category/performing organization naturally changes from fiscal year to fiscal year. Due to this, individual line items in the R-3 will increase at greater than a 2% escalation factor.															
Explanation of increases/decreases greater than 2% between FY 2023 and FY 2024:															
- EEC3 FRC-SE Jacksonville FL increased from \$0.635M to \$0.721M due to increase in planned tasks for continuing projects.															
- EEC3 NRL Washington DC increased from \$0.270M to \$0.300M due to increase in field work for continuing projects.															
- EEC4 NSWC Bethesda MD increased from \$0.065M to \$0.100M due to increase in field work for continuing projects.															
- EEC4a NIWC San Diego increased from \$0.775M to \$0.919M due to an increase in planned tasks for continuing projects.															
- EEC5 EXWC Port Hueneme CA increased from \$0.600M to \$0.830M due to an increase in field work for continuing projects.															
- EEC5 NIWC San Diego CA increased from \$0.730M to \$1.005M due to increase in field work for continuing projects.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			68.891	5.359		5.197		6.010		-		6.010	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4								R-1 Program Element (Number/Name) PE 0603721N / Environmental Protection				Project (Number/Name) 0817 / Environmental Sustainability Development (NESDI)			

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 0817																												
EEC 2																												
EEC 3																												
EEC 4																												
EEC 5																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 0817 / <i>Environmental Sustainability Development (NESDI)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 0817</i>				
EEC 2	1	2022	4	2028
EEC 3	1	2022	4	2028
EEC 4	1	2022	4	2028
EEC 5	1	2022	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>				Project (Number/Name) 2549 / <i>Environmental Restoration</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2549: <i>Environmental Restoration</i>	0.000	7.550	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.550
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

PFAS Strategic Projects FY22 to Address Navy's Challenges with PFAS Site Management Expeditionary Warfare Center and Naval Facilities Engineering Command HQ, in consultation with the Environmental Restoration Managers, have developed eight (8) projects that are important for the Navy's ability to address the challenges related to PFAS site investigations and treatments. PFAS behavior in the environment is still not well understood and treating PFAS in soil and groundwater remains challenging because the carbon-fluorine bonds in these compounds are extremely difficult to break. The goal of this effort is to further the understanding of PFAS behavior in the environment at Navy sites, and to develop and demonstrate sampling tools, characterization methods, and promising treatment or destruction technologies for PFAS. The eight projects are:

1. PFAS source zone characterization and limited sampling
2. PFAS groundwater plume modeling and risk evaluation guidance
3. Design and demonstration of a passive flux meter for PFAS remedial investigation
4. Characterizing PFAS sources to surface water receptors at IR sites
5. Innovative destructive hydrothermal technologies for PFAS
6. Fractionation of PFAS-impacted groundwater
7. Injection and infiltration of stabilizers for in-situ sequestration of PFAS sources
8. Assessment of PFAS mass transfer via sources leaching into soil and groundwater

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Develop PFAS site investigations and treatments	7.550	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2023 Plans: N/A					
FY 2024 Base Plans: N/A					
FY 2024 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	7.550	0.000	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 2549 / <i>Environmental Restoration</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy This project is categorized as Non-ACAT (Non Acquisition)		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603721N / Environmental Protection						Project (Number/Name) 2549 / Environmental Restoration			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
EEC 2	Various	EXWC : PT HUENEME, CA	0.000	7.550	Sep 2022	0.000		0.000		-		0.000	0.000	7.550	-
Subtotal			0.000	7.550		0.000		0.000		-		0.000	0.000	7.550	N/A
Remarks															
Performing Activities: Engineering and Expeditionary Warfare Center (EXWC), Port Hueneme, CA															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	7.550		0.000		0.000		-		0.000	0.000	7.550	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0603721N / Environmental Protection

Project (Number/Name)
2549 / Environmental Restoration

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 2549																												
EEC 2																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 2549 / <i>Environmental Restoration</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 2549</i>				
EEC 2	1	2022	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>				Project (Number/Name) 9204 / <i>Marine Mammal Research</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9204: <i>Marine Mammal Research</i>	41.518	5.926	6.399	6.832	-	6.832	6.831	6.963	7.088	7.230	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Navy has been and will continue to be subject to litigation with regard to the potential injuring, killing or biologically significant disturbance of marine animals by the use of intense underwater sound. Since Fleet operation and training areas coincide with known or probable habitats, migration routes, or breeding areas of marine mammals and other protected marine species, the possibility exists that such incidents are likely to continue in the future. The increasing public interest and pressure has resulted in escalating Fleet costs. For example, Fleet and SYSCOM development activities have been interrupted; modified, or altogether cancelled and environmental regulations have, among other things, required new ship construction shock trials to obtain Federal permits and conduct extensive environmental planning that can take several years to complete. The incorporation of mitigation measures in Fleet training operations to minimize the potential adverse effects on protected marine animals can significantly reduce the realism of these operations. In addition, the testing, evaluation, and deployment of new sonar detection and monitoring systems that use active acoustics are under intense public scrutiny for their potential adverse effects on whales and other marine mammals. Navy needs scientific evidence to substantiate its claims of limited or inconsequential adverse effects to marine life from operations.

This project primarily focuses on the development of planning, monitoring, and mitigating tools to aid the Fleet in minimizing contact with and the potential harassment of protected marine animals during operations, exercises, training, and undersea surveillance and weapons testing. These new capabilities will encompass historical and newly acquired data and analytical models that together can predict marine animal habitats (where they are likely to be), and their natural and expected behavior (diving patterns, prey localization, calling activity, etc.). This project consists of three major areas that will help ensure Navy compliance with the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA).

These areas are (1) Marine Ecology and Population Dynamics - determine the likelihood of the presence of marine mammals or other protected species by developing habitat and ecological models. Refine marine animal survey techniques to optimize the accuracy of abundance estimates in small ocean regions of Navy interest. (2) Criteria, Thresholds, and Mitigation - Establish criteria and thresholds from which to measure potential impact on marine mammals and other marine species from Navy training operations. Determine the effectiveness and usefulness of various mitigation measures in relation to the potential impact of Navy operations on marine mammals; and (3) Mitigation Methodologies - Determine the observation, detection and classification measures required to develop effective monitoring and mitigation procedures for Fleet and SYSCOM use. Focus on improving marine animal monitoring capabilities over current methods by developing new technologies or improving existing technologies that improve monitoring and mitigation effectiveness, reduce cost and minimize impacts on readiness activities.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Marine Ecology and Population Dynamics	1.134	1.134	1.384	0.000	1.384
Articles:	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603721N / Environmental Protection		Project (Number/Name) 9204 / Marine Mammal Research		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Description: Within the area of 'Marine Ecology and Population Dynamics', ongoing work covers topics such as density estimation from passive acoustic data, standards/metrics development and development of an automated sonar detector to standardize analysis of acoustic data.</p> <p>FY 2023 Plans: Ongoing studies that are expected to be completed by the end of FY 2023: -MSM4PCoD: Marine Species Monitoring for the Population Consequences of Disturbance -Capability enhancements for Tethys, a passive acoustic metadata workbench</p> <p>Ongoing studies that will continue into FY 2024: -ACCURATE: ACooustic CUe RATES for passive acoustic density estimation -Demonstration and validation of passive acoustic density estimation for right whales -Combining global OBS and CTBTO recordings to estimate abundance and density of fin and blue whales</p> <p>In addition, studies are expected to be initiated in FY2023 in response to needs collected from Navy personnel in FY 2022.</p> <p>FY 2024 Base Plans: Ongoing studies that are expected to be completed by the end of FY 2024: -ACCURATE: ACooustic CUe RATES for passive acoustic density estimation -Demonstration and validation of passive acoustic density estimation for right whales</p> <p>Ongoing studies that will continue into FY 2025: -Combining global OBS and CTBTO recordings to estimate abundance and density of fin and blue whales -RAVEN-X: Enhancing the efficiency of large-scale bioacoustic analyses -Cetacean Caller-ID [CETACID]: Validating approaches for identifying focal communication signals using acoustic recording tags -Climate change projects</p> <p>In addition, studies are expected to be initiated in FY2024 in response to needs collected from Navy personnel in FY 2023.</p> <p>FY 2024 OCO Plans:</p>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603721N / Environmental Protection		Project (Number/Name) 9204 / Marine Mammal Research		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: FY24 increase (\$0.250M) supports addressing climate change projects.						
Title: Criteria and Thresholds, Physiology and Behavior, and Effects of Sound		3.577	4.050	4.233	0.000	4.233
Articles:		-	-	-	-	-
Description: Within the area of 'Criteria and Thresholds, Physiology and Behavior, and Effects of Sound', ongoing work covers topics such as hearing, temporary threshold shift, behavioral response studies, and effects from underwater explosions.						
FY 2023 Plans: Ongoing studies that are expected to be completed by the end of FY 2023: -Multi-spaced measurement of underwater sound fields from explosive sources (this project was extended due to COVID-19) -Temporary threshold shifts in underwater hearing sensitivity in aquatic turtles -Frequency-dependent, underwater, temporary threshold shift in California sea lions -Collection of In situ acoustic data for validation of US Navy propagation models of ship shock trial sound sources						
Ongoing studies that will continue into FY 2024: -Collection of auditory evoked potential hearing thresholds in minke whales (Balaenoptera acutorostrata) data on sea turtle hearing/TTS -Towards a mysticete audiogram using humpback whales' behavioral response thresholds data on mysticete hearing -Standardizing auditory evoked potential hearing thresholds with behavioral hearing thresholds -Loudness perception in killer whales (Orcinus orca); effects of temporal and frequency summation -Minimum sound pressure levels required for TTS during simulated continuously active sonar -3S4: Effects of continuous active sonar and longer duration sonar exposures -Behavioral response to SURTASS LFA sonar						
In addition, studies are expected to be initiated in FY2023 in response to needs collected from Navy personnel in FY 2022.						
FY 2024 Base Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603721N / Environmental Protection		Project (Number/Name) 9204 / Marine Mammal Research		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Within the area of 'Criteria and Thresholds, Physiology and Behavior, and Effects of Sound', ongoing work covers topics such as hearing, temporary threshold shift, behavioral response studies, and effects from underwater explosions.						
Ongoing studies that are expected to be completed by the end of FY 2024: -Collection of auditory evoked potential hearing thresholds in minke whales (Balaenoptera acutorostrata) data on sea turtle hearing/TTS -Towards a mysticete audiogram using humpback whales' behavioral response thresholds data on mysticete hearing -Standardizing auditory evoked potential hearing thresholds with behavioral hearing thresholds -Loudness perception in killer whales (Orcinus orca); effects of temporal and frequency summation -Minimum sound pressure levels required for TTS during simulated continuously active sonar -Dolphin conditioned hearing attenuation						
Ongoing studies that will continue into FY 2024: -3S4: Effects of continuous active sonar and longer duration sonar exposures -Behavioral response to SURTASS LFA sonar -Effect of signal duration on perceived loudness in bottlenose dolphins and California sea lions						
In addition, studies are expected to be initiated in FY 2024 in response to needs collected from Navy personnel in FY 2023.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: FY24 increase (\$0.183M) supports ongoing projects reaching the height of their effort (data collection and data analysis) along with some new projects expected to begin.						
Title: Mitigation Methodologies: Monitoring, New Technology, and Risk Assess Articles: Description: Within the area of 'Mitigation Methodologies', ongoing work covers demonstration and validation of new technologies for monitoring and mitigation. FY 2023 Plans:		1.215 -	1.215 -	1.215 -	0.000 -	1.215 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>		Project (Number/Name) 9204 / <i>Marine Mammal Research</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Ongoing studies that will continue into FY 2024:</p> <ul style="list-style-type: none"> -M3R (Marine Mammal Monitoring on Navy Ranges) -Improve Tag Attachment System for Remotely-Deployed Medium-Term Cetacean Tags <p>No studies are scheduled to be completed by the end of FY2023. Studies are expected to be initiated in FY 2023 in response to needs collected from Navy personnel in FY 2022.</p> <p><i>FY 2024 Base Plans:</i> Within the area of 'Mitigation Methodologies', ongoing work covers demonstration and validation of new technologies for monitoring and mitigation.</p> <p>Ongoing studies that are expected to be completed by the end of FY 2024:</p> <ul style="list-style-type: none"> -Improve Tag Attachment System for Remotely-Deployed Medium-Term Cetacean Tags -Demonstrating suction-cup tag systems to support behavioral response studies (BRS) <p>Ongoing studies that will continue into FY 2025:</p> <ul style="list-style-type: none"> -M3R (Marine Mammal Monitoring on Navy Ranges) -Integration and field evaluation of the next generation high-fidelity sound and movement tags to investigate behavioral response <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> No change in funding.</p>						
Accomplishments/Planned Programs Subtotals		5.926	6.399	6.832	0.000	6.832
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
RDTEN Contracts are Competitive Procurements.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 9204 / <i>Marine Mammal Research</i>
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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	Various	EXWC CA : Port Hueneme, CA	5.338	0.986	Oct 2021	1.005	Oct 2022	1.255	Oct 2023	-		1.255	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	SPAWAR CA : San Diego, CA	1.573	0.200	Oct 2021	0.204	Oct 2022	0.208	Nov 2023	-		0.208	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	SS/CPFF	MARECOTEL : Seabeck, WA	2.360	0.600	Oct 2021	0.400	Oct 2022	0.000		-		0.000	0.000	3.360	-
Developmental Test & Evaluation (DT&E)	Various	EXWC PH : Port Hueneme, CA	4.383	2.371	Jan 2022	3.039	Jan 2023	3.585	Oct 2023	-		3.585	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NAVAIR : Lakehurst, NJ	0.732	0.075	Oct 2021	0.075	Oct 2022	0.075	Nov 2023	-		0.075	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	Various	EXWC : Port Hueneme, CA	2.128	0.714	Oct 2021	0.728	Oct 2022	0.742	Oct 2023	-		0.742	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NUWC RI : Newport, RI	11.851	0.300	Oct 2021	0.306	Oct 2022	0.312	Nov 2023	-		0.312	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NPGS : Monterey, CA	3.699	0.030	Oct 2021	0.030	Oct 2022	0.031	Nov 2023	-		0.031	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	MIPR	NOAA: Various : La Jolla, CA	3.661	0.050	Oct 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NUWC : Newport, RI	0.700	0.300	Oct 2021	0.306	Oct 2022	0.312	Nov 2023	-		0.312	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	SS/CPFF	SPAWAR : San Diego, CA	5.093	0.300	Oct 2021	0.306	Oct 2022	0.312	Nov 2023	-		0.312	Continuing	Continuing	Continuing
Subtotal			41.518	5.926		6.399		6.832		-		6.832	Continuing	Continuing	N/A

Remarks

Individual projects are derived from field level needs and awarded competitively to performing organizations, the portfolio mix of cost category/performing organization naturally changes from fiscal year to fiscal year. Increase due to planned FY 2023/2024 projects that will be awarded competitively by EXWC to performing organizations based on subject matter expertise required by Navy need.

The following increases are above 2% from FY 2023 to FY 2024:

- Developmental Test and Evaluation: EXWC: Port Hueneme, CA; Increase from \$1.005M to \$1.255M due to specific needs of climate change related projects.
- Developmental Test and Evaluation: EXWC: Port Hueneme, CA; Increase from \$3.039M to \$3.566M supports studying of behavioral response from SURTASS LFA and continuously active sonar (CAS).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603721N / Environmental Protection					Project (Number/Name) 9204 / Marine Mammal Research			
	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	41.518	5.926		6.399		6.832		-		6.832	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0603721N / Environmental Protection

Project (Number/Name)
9204 / Marine Mammal Research

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MARINE MAMMAL RESEARCH																												
Marine Mammal Ecology and Population Dynamics																												
Criteria and Thresholds, Physiology and Behavior, and Effects of Sound																												
Mitigation Methodologies: Monitoring, New Technology, and Risk Assessment																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603721N / <i>Environmental Protection</i>	Project (Number/Name) 9204 / <i>Marine Mammal Research</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
MARINE MAMMAL RESEARCH				
Marine Mammal Ecology and Population Dynamics	1	2022	4	2028
Criteria and Thresholds, Physiology and Behavior, and Effects of Sound	1	2022	4	2028
Mitigation Methodologies: Monitoring, New Technology, and Risk Assessment	1	2022	4	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	565.773	64.991	75.320	72.214	-	72.214	61.256	48.513	47.018	48.312	Continuing	Continuing
0829: ENERGY CONSERVATION (ADV)	88.487	9.603	14.056	21.131	-	21.131	16.109	12.535	12.659	12.812	Continuing	Continuing
0838: Mobility Fuels (ADV)	122.718	9.030	7.442	6.491	-	6.491	8.463	8.365	8.049	8.211	Continuing	Continuing
0928: Shore Energy Technology	59.021	1.910	1.981	2.059	-	2.059	2.111	2.155	2.199	2.244	Continuing	Continuing
0996: Aircraft Energy Conservation	177.643	6.863	26.203	30.419	-	30.419	22.905	16.906	17.019	17.362	Continuing	Continuing
2566: Battery Development and Safety	0.000	4.290	10.638	12.114	-	12.114	11.668	8.552	7.092	7.683	Continuing	Continuing
9999: Congressional Adds	117.904	33.295	15.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	166.199

A. Mission Description and Budget Item Justification

This program supports projects to evaluate, adapt, and demonstrate energy related technologies for Navy aircraft and ship operations to: (a) increase fuel-related weapons systems capabilities such as range and time on station; (b) reduce energy costs; (c) apply energy technologies that improve environmental compliance; (d) examine restrictive fuel specification requirements to reduce cost and increase availability worldwide; (e) provide guidance to fleet operators for the safe use of commercial grade or off-specification fuels; and (f) make needed periodic changes to fuel specifications to ensure fuel quality and avoid fleet operating problems. This program supports the achievement of legislated, White House, Department of Defense, and Navy energy management goals.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0603724N / Navy Energy Program			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	66.824	60.320	58.125	-	58.125
Current President's Budget	64.991	75.320	72.214	-	72.214
Total Adjustments	-1.833	15.000	14.089	-	14.089
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	15.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.050	0.000			
• SBIR/STTR Transfer	-1.883	0.000			
• Program Adjustments	0.000	0.000	13.693	-	13.693
• Rate/Misc Adjustments	0.000	0.000	0.396	-	0.396
Congressional Add Details (\$ in Millions, and Includes General Reductions)					
Project: 9999: Congressional Adds					
Congressional Add: Marine energy systems for sensors and microgrids					
Congressional Add: Navy energy program					
Congressional Add: Cargo drone family of advanced batteries					
Congressional Add: Navy energy systems					
Congressional Add Subtotals for Project: 9999					
Congressional Add Totals for all Projects					
Change Summary Explanation					
FY 2024 funding request increased by \$11.894M.					
Project 0829 - increase of \$7.075M for energy efficiency efforts.					
Project 0838 - decrease of \$0.951M due to Misc adjustments.					
Project 0928 - increase of \$0.078M for Misc adjustments.					
Project 0996 - increase of \$4.216M for Misc adjustments.					
Project 2566 - increase of \$1.476M for renewable energy and jumpstart program efforts.					
Schedule:					

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program	
<p>Project 0996- Aircraft Dashbooard extends from 1st QTR FY22 to 4th QTR FY24. Advanced fuel cells for UAS application extends from 2nd QTR FY23 to 4th QTR FY24.</p> <p>Project 0838 - Advance Chemical Composition Detection Technology extends from 2nd QTR of FY23 to 4th QTR of FY24.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program				Project (Number/Name) 0829 / ENERGY CONSERVATION (ADV)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0829: ENERGY CONSERVATION (ADV)	88.487	9.603	14.056	21.131	-	21.131	16.109	12.535	12.659	12.812	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Energy Conservation Advanced Project is designed to enhance lethality, resilience, reach, and sustainment of warfare systems through more effective generation, use and distribution of energy on existing and future surface fleet assets, including Unmanned Surface Vessels (USVs), by developing and transitioning energy and maintenance improvements. This project, managed through NAVSEA 05T, will identify mature, promising energy related technologies through involvement with Fleet representatives, Life-Cycle Managers (LCMs), NAVSEA Technical Warrant Holders, In-Service Engineering Agents (ISEAs), the Navy Shipbuilding Research Program (NSRP), PEOs, Industry, and Academia. The project directly supports Department of Navy goals for agility, resilient force posture, and innovation by maximizing energy to increase operational capability (e.g., extend range, increase time on station, enable high power combat systems). Potential technology areas include Power Generation and Storage (PG&S), Hull Hydrodynamics (HH), Underwater Hull Husbandry (UHH), Heating, Ventilation & Air Conditioning (HVAC) Systems, Thermal Management (TM), Main Propulsion Systems (MP), Electrical Systems (EL), Auxiliary Systems (AUX) and Energy Monitoring, Planning, and Assessment (EMP&A). Promising energy related proposals that improve the effective use, conversion, storage, distribution, and control of energy to enable the integration with future weapons and sensors onto platforms are developed each FY for evaluation. Projects are selected based on technical review and business case analysis. Not all proposals are pursued, and funding changes between functional categories or fiscal years may occur based on fleet needs, technology maturity level, ship schedule changes, or other factors.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Power Generation and Storage Sub Project	2.402	4.050	0.546	0.000	0.546
Articles:	-	-	-	-	-
Description: This project area will accomplish prototype development, laboratory and Fleet testing to determine overall effectiveness of technologies focused on improving efficiency of current power generation & storage methodologies.					
FY 2023 Plans: FY23 funding will continue congressionally funded efforts, which began in FY21, to develop a new electronic fuel injection (EFI) system for the Fairbanks Morse PA6B engines installed on the LCS Freedom class, LHA-6 America Class & LHD-8 Makin Island class vessels and include the development and environmental testing of upgraded fuel nozzles for installation on these platforms. Upgrading the fuel delivery system to electronic fuel injection will improve fuel efficiency of the engine by approximately 3-5%, reduce emissions and visible smoke, and reduce maintenance manhours and costs. Funding will also continue prototyping & land based testing a					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program		Project (Number/Name) 0829 / ENERGY CONSERVATION (ADV)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>1500 Volt Amp (VA) Uninterrupted Power Supply (UPS) using Lithium Iron Phosphate batteries, which will offer a 2x increase in operational life and reduce life cycle costs on most surface ship applications. This development effort will lead to shipboard installation and test in the following year(s).</p> <p>In addition, continue to identify other energy saving/capability improvement technologies in Power Generation & Storage and prepare proposals and business case analyses for promising technologies, with potential to reduce fuel demand and increase capability through increased time on station and/or enabling future combat system advancements.</p> <p>FY 2024 Base Plans: FY24 funding will produce the design and control basis (Hardware & Software) for dissimilar power resources and will consider the use of paralleled power generation and energy storage interface as a dynamic source and load, with energy storage being able to be dispatched as necessary according to weapon system load requirements. Funding will also continue prototyping & land based testing a 1500 Volt Amp (VA) Uninterrupted Power Supply (UPS) using Lithium Iron Phosphate batteries, which will offer a 2x increase in operational life and reduce life cycle costs on most surface ship applications. This effort will complete in FY24 with an analysis of the findings from the shipboard demonstration.</p> <p>In addition, continue to identify other energy saving/capability improvement technologies in Power Generation & Storage and prepare proposals and business case analyses for promising technologies, with potential to reduce fuel demand and increase capability through increased time on station and/or enabling future combat system advancements.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: FY24 decrease (\$3.504M) is due to completion of efforts on PA6B Diesel Engine and a shift in focus on other projects within the PG&S focus area.</p>						
<p>Title: Underwater Hull Husbandry Sub Project</p> <p>Articles:</p> <p>Description: Project funds will be utilized to identify and evaluate new underwater hull/propeller coating systems and underwater hull cleaning and maintenance techniques to reduce hydrodynamic drag on the hull and thereby increase fuel efficiency.</p>		0.783 -	0.906 -	0.602 -	0.000 -	0.602 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program		Project (Number/Name) 0829 / ENERGY CONSERVATION (ADV)	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>FY 2023 Plans: Continue development of Hull Biofouling Decision Making tool, with user interface and manual for evaluating or estimating the effects of hull biofouling on ship powering condition and fuel use. This desktop tool will employ simple computational approaches combined with ship operational data that will allow for decision making for hull maintenance, evaluation of new biofouling control technologies or strategies, and potentially for ship design, based on expected resistance and fuel use due to the presence of hull biofouling.</p> <p>In addition, continue to identify other energy saving/capability improvement technologies in Underwater Hull Husbandry and prepare proposals and business case analyses for promising technologies with potential to reduce fuel demand and increase capability through increased time on station.</p> <p>FY 2024 Base Plans: Complete the Hull Biofouling Decision Making Tool with user interface and manual for evaluating or estimating the effects of hull biofouling on ship powering condition and fuel use. This desktop tool will employ simple computational approaches combined with ship operational data that will allow for decision making for hull maintenance, evaluation of new biofouling control technologies or strategies, and potentially for ship design, based on expected resistance and fuel use due to the presence of hull biofouling.</p> <p>Continue to identify other energy saving/capability improvement technologies in Underwater Hull Husbandry and prepare proposals and business case analyses for promising technologies with potential to reduce fuel demand and increase capability through increased time on station.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: FY24 decrease (\$0.304M) is due to decreased efforts associated with the Hull Biofouling Decision Making Tool compared to previous year.</p>					
<p>Title: Hull Hydrodynamic Sub Project</p> <p>Articles:</p> <p>Description: This project area will accomplish prototype development, modeling, laboratory and Fleet testing of ship modifications to propellers and/or hull appendages to determine overall mission, energy, and cost effectiveness of these improvements.</p>	1.274 -	0.222 -	2.466 -	0.000 -	2.466 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program		Project (Number/Name) 0829 / ENERGY CONSERVATION (ADV)	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>FY 2023 Plans: Continue to identify other energy saving/capability improvement technologies in Hull Hydrodynamics and prepare proposals and business case analyses for promising technologies with potential to reduce fuel demand and increase capability through increased time on station.</p> <p>FY 2024 Base Plans: Energy savings of appropriately designed Hydrodynamic Hull Appendages (HHA) is well documented; however, the government does not have robust methods to specify or validate contractors' Computational Fluid Dynamics (CFD) analysis of HHAs performance. A study will be conducted by utilizing existing HHA model-scale testing data as a validation for CFD/Fluid Flow analysis methods to determine input and modeling requirements to accurately predict appendage performance. Parametric studies will then be conducted to determine/verify the ability of CFD/Fluid Flow analysis to predict data trends and provide optimized results. Study results will be used to develop updates to DDS-051 design guidance and develop a Data Item Description (DID) to support ship design during acquisition. In addition, fluid dynamics and other advanced analytical capabilities will be used to explore more efficient hull designs for future surface combatants.</p> <p>Continue to identify other energy saving/capability improvement technologies in Hull Hydrodynamics and prepare proposals and business case analyses for promising technologies with potential to reduce fuel demand and increase capability through increased time on station.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: FY24 increase (\$2.244M) provided for examining and validating Computational Fluid Dynamics (CFD)/Fluid Flow methods for Hydrodynamic Hull Appendages and another project to explore more efficient hull designs for future surface combatants.</p>					
<p>Title: Heating, Ventilation and Air Conditioning (HVAC) Sub Project</p> <p>Articles:</p> <p>Description: Project funds will be utilized to accomplish prototype development, land and shipboard testing of improvements aimed at more efficient climate control of shipboard spaces.</p> <p>FY 2023 Plans:</p>	0.471 -	0.772 -	0.605 -	0.000 -	0.605 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program		Project (Number/Name) 0829 / ENERGY CONSERVATION (ADV)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>The LHD 1 class is currently operating at full available cooling capacity or negative cooling margin using existing 300-ton chillers. FY23 funding will leverage existing Monoshell heat-exchanger High Efficiency Super Capacity (HESC) technology, on both LPD and DDG platforms, and apply it to a Double Barrel heat-exchanger design as a direct upgrade to the existing 300-ton legacy AC Plant currently in-use by the LHD 1 class. The product of this engineering analysis effort will be an HESCDB Conceptual Design and Draft Interface Control Document (ICD). The HESC Double Barrel (HESCDB) technology development will support future development and installation of a modern AC Plant containing both new hardware and software for use onboard any LHD.</p> <p>In addition, continue to identify other energy saving/capability improvement technologies in HVAC and prepare proposals and business case analyses for promising technologies with potential to reduce fuel demand and increase capability through increased time on station and/or enabling future combat system advancements.</p> <p>FY 2024 Base Plans: Advanced Thermal Insulation for shipboard use will be researched, developed and tested for viability on naval ships. Market research will be conducted for commercially available products, a cost benefit analysis will be performed on various candidates, and procurement specifications will be drafted.</p> <p>Continue to identify other energy saving/capability improvement technologies in HVAC and prepare proposals and business case analyses for promising technologies with potential to reduce fuel demand and increase capability through increased time on station and/or enabling future combat system advancements.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: FY24 decrease (\$0.167M) is due to completion of High Efficiency Super Capacity Double Barrel (HESCDB) efforts.</p>						
<p>Title: Thermal Management Sub Project</p> <p>Articles:</p> <p>Description: Project funds will be utilized to identify and evaluate potential uses for Thermal Management techniques designed to reduce overall shipboard heat generation as well as incorporating waste heat recovery techniques to reduce the shipboard electrical demand on HVAC and other systems.</p> <p>FY 2023 Plans:</p>		0.296 -	0.222 -	1.996 -	0.000 -	1.996 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program		Project (Number/Name) 0829 / ENERGY CONSERVATION (ADV)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Continue to identify other energy saving/capability improvement technologies in Thermal Management and prepare proposals and business case analyses for promising technologies with potential to reduce fuel demand and increase capability through increased time on station and/or enabling future combat system advancements. FY 2024 Base Plans: Explore shipboard technologies or techniques that could be used to cool high power combat systems with very short during power draws and significant cooling needs. Also investigate waste heat recovery technologies that could produce additional electrical power for the ship using waste heat from prime movers or other large heat sources. Continue to identify other energy saving/capability improvement technologies in Thermal Management and prepare proposals and business case analyses for promising technologies with potential to reduce fuel demand and increase capability through increased time on station and/or enabling future combat system advancements. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: FY24 increase (\$1.774M) supports on shipboard cooling technologies and techniques as well as waste heat recovery options.						
Title: Main Propulsion Systems Sub Project Articles: Description: Project funds will be utilized to identify requirements and perform land based and at sea testing of surface ship and Unmanned Surface Vessel (USV) propulsion system improvements on Gas Turbine, Steam, and Diesel Engine systems to reduce overall fuel consumption and lower maintenance costs. FY 2023 Plans: This funding supports the test and evaluation of various LM2500 Gas Turbine Fuel Efficiency Concepts. Gas turbine compressor fouling reduces engine efficiency and increases fuel demand and this project will obtain an engine set of "Super Polished" compressor airfoils to test and document the potential efficiency gains by using highly polished airfoils. Additionally, this funding aims to adjust the cooling to the high-pressure turbine (HPT) in order to reduce fuel consumption at the same power output levels.		0.220 -	5.112 -	4.012 -	0.000 -	4.012 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program		Project (Number/Name) 0829 / ENERGY CONSERVATION (ADV)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>In addition, continue to identify other energy saving/capability improvement technologies in Propulsion Systems and prepare proposals and business case analyses for promising technologies, with potential to reduce fuel demand and increase capability through increased time on station.</p> <p>FY 2024 Base Plans: Continue FY23 efforts for LM2500 Gas Turbine Fuel Efficiency Concepts. Gas turbine compressor fouling reduces engine efficiency and increases fuel demand and this project will obtain an engine set of "Super Polished" compressor airfoils to test and document the potential efficiency gains by using highly polished airfoils. Additionally, this funding aims to adjust the cooling to the high-pressure turbine (HPT) in order to reduce fuel consumption at the same power output levels.</p> <p>In addition, continue to identify other energy saving/capability improvement technologies in Propulsion Systems and prepare proposals and business case analyses for promising technologies, with potential to reduce fuel demand and increase capability through increased time on station.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: FY24 decrease (\$1.100M) is due to reduced cost for LM2500 Gas Turbine efforts.</p>						
<p>Title: Electrical Systems Sub Project</p> <p>Articles:</p> <p>Description: Project funds will be utilized to identify and perform land based and shipboard testing of ship electrical system improvements to optimize power and energy use.</p> <p>FY 2023 Plans: Advanced electric plant operations and utilization of energy storage systems on ship platforms require the need for cross-control system coordination. FY23 funding will support development and demonstration of Cross-control system interface which will enable advanced utilization and deployment of Energy Storage, advanced power management, and load shedding techniques to realize efficient operations and fuel savings</p> <p>In addition, continue to identify other energy saving/capability improvement technologies in Electrical Systems and prepare proposals and business case analyses for promising technologies with potential to reduce fuel</p>		0.725 -	0.902 -	1.466 -	0.000 -	1.466 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program		Project (Number/Name) 0829 / ENERGY CONSERVATION (ADV)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
demand and increase capability through increased time on station and/or enable future combat system enhancements. FY 2024 Base Plans: Existing Non-Intrusive Load Monitoring (NILM) sensors are stand-alone and lack network connection requiring ship visits to remove data sets. FY 24 funding will develop a Concept of Operations Plan (CONOP), architectures and Interface Design Document (IDD) for NILM and existing data acquisition systems on navy ships. Objective is to develop a functional system prototype for NILM integration into CANES and into eRM and install shipboard as a proof-of-concept test. In addition, continue to identify other energy saving/capability improvement technologies in Electrical Systems and prepare proposals and business case analyses for promising technologies with potential to reduce fuel demand and increase capability through increased time on station and/or enable future combat system enhancements. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: FY24 increase (\$0.564M) supports Non-Intrusive Load Monitoring (NILM) network integration effort.						
Title: Auxiliary Systems Sub Project Articles: Description: Project funds will be utilized to identify, test and evaluate new technologies for shipboard auxiliary systems aimed at reducing fuel consumption. FY 2023 Plans: Continue to identify additional energy saving/capability improvement technologies in auxiliary systems and prepare proposals and business case analyses for promising technologies, with potential to reduce fuel demand and increase capability through increased time on station and/or enable future combat system enhancements. FY 2024 Base Plans: Continue to identify additional energy saving/capability improvement technologies in auxiliary systems and prepare proposals and business case analyses for promising technologies, with potential to reduce fuel demand and increase capability through increased time on station and/or enable future combat system enhancements. FY 2024 OCO Plans:		0.221 -	0.222 -	0.316 -	0.000 -	0.316 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program		Project (Number/Name) 0829 / ENERGY CONSERVATION (ADV)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: FY24 increase (\$0.094M) supports identifying new work in this area, conducting the business case analysis, and down selecting from a list of proposals.						
Title: Energy Monitoring, Planning & Assessment		3.211	1.648	9.122	0.000	9.122
Articles:		-	-	-	-	-
Description: This project area will focus on methods of capturing and displaying energy related data to shipboard personnel as actionable information for ships force to employ energy conservation measures underway and in port as mission requirements permit. Through projects like GENISYS, it also supports Naval Operational Architecture/Joint All-Domain Command and Control.						
FY 2023 Plans: Continue GENISYS development efforts and shipboard evaluation including implementation of critical updates based on user feedback and integration with enterprise Remote Monitoring (eRM) and other fuel related navy enterprise applications. Continue expanding GENISYS capability to other ship classes.						
In addition, continue to identify other energy capability improvement technologies and monitoring methodologies and prepare proposals and business case analyses for promising technologies, with potential to reduce fuel demand and increase capability through increased time on station and/or enable future combat system enhancements.						
FY 2024 Base Plans: Continue GENISYS software development lifecycle (SDLC) efforts for developing USFF Requirements Management Board capabilities and shipboard evaluation including implementation of critical updates based on user feedback and integration with enterprise Remote Monitoring (eRM) and other fuel related navy enterprise applications. Continue expanding GENISYS capability to the LPD-17 class and exploring feasibility of a cross security domain solution.						
Initiate planning efforts to remove previously installed TRITON system on DDG 102 for test and evaluation.						
Conduct a shipboard demonstration of an emission's monitoring system in the exhaust stack of a gas turbine in order to monitor emissions but also utilize the information to determine if power generation and propulsion systems are operating efficiently or require maintenance.						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program		Project (Number/Name) 0829 / ENERGY CONSERVATION (ADV)	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Develop new shipboard power and energy curricula for USN personnel and navy engineers.</p> <p>Initiate efforts to pilot a commercial energy technology demonstration on a MARAD training vessel to show the efficiency and cost savings associated with this approach as compared to traditional navy shipboard prototyping.</p> <p>Begin a multi-year effort to improve enterprise-wide energy monitoring and visibility. This includes developing the capability to conduct thorough and effective energy supportability analysis in support of the energy key performance parameters, improving the theater energy modeling work that was started under previous efforts, and expanding on the existing coordination of efforts across the various fuel logistics, decarbonization working groups, and fleet energy monitoring programs throughout the USN and USMC.</p> <p>In addition, continue to identify other energy capability improvement technologies and monitoring methodologies and prepare proposals and business case analyses for promising technologies, with potential to reduce fuel demand and increase capability through increased time on station and/or enable future combat system enhancements.</p> <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> FY24 increase (\$7.474M) due to the start of Triton Hull Sensor removal work, a shipboard emissions monitoring demonstration, development of power and energy training curricula, piloting a commercial energy technology shipboard demonstration with MARAD, and supporting the enterprise-wide energy monitoring and visibility work.</p>					
Accomplishments/Planned Programs Subtotals					
	9.603	14.056	21.131	0.000	21.131
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					
D. Acquisition Strategy					
RDT&E Contracts are Competitive Procurements.					

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program				Project (Number/Name) 0829 / ENERGY CONSERVATION (ADV)					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	C/CPFF	NAVSEA HQ : Washington, DC	1.310	0.000		0.000		0.000		-		0.000	0.000	1.310	-
Systems Engineering	Grant	NSWC DD : Dahlgren, VA	0.100	1.112	Dec 2021	0.000		0.000		-		0.000	0.000	1.212	-
Systems Engineering	WR	NSWC Philadelphia : Philadelphia, PA	3.537	1.297	Dec 2021	0.800	Nov 2022	1.715	Nov 2023	-		1.715	0.000	7.349	-
Primary Hardware Development	WR	NSWC Carderock : Bethesda, MD	8.983	0.000		0.612	Dec 2022	0.000		-		0.000	0.000	9.595	-
Systems Engineering	WR	NSWC PHD : Port Hueneme, CA	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	-
Systems Engineering	C/CPAF	NSWC Carderock : Bethesda, MD	6.948	0.000		0.000		0.000		-		0.000	0.000	6.948	-
Engineering Development	WR	NSWC Carderock : Bethesda, MD	9.002	1.053	Nov 2021	0.000		2.436	Nov 2023	-		2.436	0.000	12.491	-
Demonstration & Evaluation	WR	NSWC Carderock : Bethesda, MD	8.149	0.000		0.000		0.000		-		0.000	0.000	8.149	-
System Development	C/BOA	NAWC-AD : Lakehurst, NJ	7.038	1.940	Dec 2021	0.500	Jan 2023	0.000		-		0.000	0.000	9.478	-
Primary Hardware Development	C/CPAF	NSWC Phila : Philadelphia, PA	0.000	0.000		3.580	Feb 2023	0.000		-		0.000	0.000	3.580	-
System Engineering	WR	NSWC CR : Crane, Indiana	0.300	0.000		0.000		0.035	Nov 2023	-		0.035	0.000	0.335	-
System Engineering	WR	NUWC NPT : Newport, Rhode Is	0.193	0.000		0.000		0.000		-		0.000	0.000	0.193	-
Primary Hardware Development	WR	NSWC PD : Philadelphia, PA	0.000	0.000		1.580	Nov 2022	0.100	Nov 2023	-		0.100	0.000	1.680	-
Engineering Development	WR	NSWC PD : Philadelphia, PA	0.000	0.000		0.000		0.655	Nov 2023	-		0.655	0.000	0.655	-
Systems Engineering	C/CPAF	SOS Bath Maine : Bath, Maine	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Engineering Development	MIPR	Army Research Lab : Arlington, TX	0.000	0.000		0.000		0.150	Jan 2024	-		0.150	0.000	0.150	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program	Project (Number/Name) 0829 / ENERGY CONSERVATION (ADV)
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Development	C/CPFF	FEDSIM : Washington, DC	0.000	0.000		0.000		0.512	Jan 2024	-		0.512	0.000	0.512	-
Engineering Development	C/CPAF	NSWC Philadelphia : Philadelphia, PA	0.000	0.000		0.000		0.505	Jan 2024	-		0.505	0.000	0.505	-
Subtotal			45.660	5.402		7.072		6.108		-		6.108	0.000	64.242	N/A

Remarks

Increase of \$0.915M for Systems Engineering NSWC PD (G/WR) reflects an adjusted mix of FY24 development projects. A decrease of \$0.612M in Primary Hardware Development NSWC CD reflects completion of Biofouling project in FY23. A decrease of \$3.58M / NSWC PD (C/CPAF) reflects a decrease in FY24 projects contract requirements. Increase of \$0.035M for Systems Engineering NSWC CR reflects support for FY24 UPS Lithium-ion Batteries. Increase of \$2.436M for Engineering Development NSWC CR reflects support for FY24 CFD for Hull Hydro Appendages Project and Surface Combatant Hull Efficiency Design work. Decrease of \$1.480M NSWC PD (G/WR) reflects an adjusted mix of FY24 development projects. Increase of \$0.655M for Engineering Development NSWC PD (G/WR) reflects an adjusted mix of FY24 development projects. Increase of \$0.150M for Engineering Development ARL reflects support for FY24 Non-Intrusive Load Monitoring (NILM) network integration. Decrease of \$.500M for NAWC-AD System Development and increase of \$.512M for FEDSIM System Development reflects a shift in contract vehicle for GENISYS Development. Increase of \$.505M for NSWC Philadelphia Engineering Development reflects an adjusted mix of FY24 development projects.

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	NSWC Carderock : Bethesda, MD	3.684	0.000		0.072	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Study Analysis	WR	NSWC CD : Bethesda, MD	1.174	0.000		0.000		0.624	Nov 2023	-		0.624	Continuing	Continuing	Continuing
Development Support	C/CPAF	NSWC Philadelphia : Philadelphia, PA	1.028	0.100	Dec 2021	0.000		0.000		-		0.000	0.000	1.128	-
Development Support	C/CPAF	NAVSEA HQ : Washington, DC	2.895	0.123	Jan 2022	0.123	Jan 2023	0.000		-		0.000	0.000	3.141	-
Development Support	WR	NSWC PD : Philadelphia, PA	3.238	0.300	Nov 2021	0.000		0.300	Nov 2023	-		0.300	0.000	3.838	-
Development Support	WR	NSWC DD : Dahlgren, Va	0.050	0.069	Nov 2021	0.000		0.000		-		0.000	0.000	0.119	-
Development Support	C/CPFF	NSWC Corona : Corona, IN	0.000	0.000		0.000		0.600	Nov 2023	-		0.600	0.000	0.600	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603724N / Navy Energy Program

Project (Number/Name)

0829 / ENERGY CONSERVATION (ADV)

Support (\$ in Millions)

				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Support	C/CPFF	PEO STRI : Orlando, FL	0.000	0.000		0.000		0.243	Jan 2024	-		0.243	0.000	0.243	-
Development Support	C/BA	Naval Postgraduate School : Monterey, CA	0.000	0.000		0.000		1.920	Jan 2024	-		1.920	0.000	1.920	-
Study Analysis	WR	NSWC DD : Dahlgren, VA	0.000	0.000		0.000		0.360	Nov 2023	-		0.360	0.000	0.360	-
Study Analysis	C/CPAF	NSWC Dahlgren : Dahlgren, VA	0.000	0.000		0.000		0.040	Jan 2024	-		0.040	0.000	0.040	-
Study Analysis	C/CPAF	NSWC Carderock : Carderock, MD	0.000	0.000		0.000		0.850	Jan 2024	-		0.850	0.000	0.850	-
Study Analysis	C/CPFF	PEO STRI : Orlando, FL	0.000	0.000		0.000		1.000	Jan 2024	-		1.000	0.000	1.000	-
Subtotal			12.069	0.592		0.195		5.937		-		5.937	Continuing	Continuing	N/A

Remarks

Decrease of \$0.072M for Development Support / NSWC CD reflects adjusted mix for FY24 projects. Decrease of \$0.123M for NAVSEA HQ Development Support and increase of NSWC Corona Development Support reflects transfer of support to new contract vehicle. Increase of \$0.300M for Development Support / NSWC PD reflects FY24 requirement for TRITON Removal planning support. Increase of \$0.600M for NSWC Corona C/CPFF reflects transfer of development support to a new contract. Increase of \$0.243M for PEO STRI Software Support reflects shift of previous work to new contract vehicle. Increase of \$1.920M for Naval Postgraduate School Development Support is for shipboard power and energy training and education curriculum development. Increase of \$0.624M for NSWC CD (G/WR), \$0.850M for NSWC Carderock (C/CPAF), \$0.360M for NSWC DD (G/WR), \$0.040M for NSWC Dahlgren (C/CPAF), and \$1.000M for PEO STRI is for start of the new Enterprise-wide Energy Visibility project.

Test and Evaluation (\$ in Millions)

				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NSWC Carderock : Bethesda, MD	10.645	0.562	Nov 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	C/CPAF	NSWC Philadelphia : Philadelphia, PA	0.383	0.000		3.482	Jan 2023	4.410	Jan 2024	-		4.410	0.000	8.275	-
Developmental Test & Evaluation (DT&E)	WR	NSWC PD : Philadelphia, PA	0.918	0.662	Nov 2021	0.506	Dec 2022	1.636	Nov 2023	-		1.636	0.000	3.722	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program	Project (Number/Name) 0829 / ENERGY CONSERVATION (ADV)
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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	APL : Washington, DC	0.085	0.000		0.000		0.000		-		0.000	0.000	0.085	-
Developmental Test & Evaluation (DT&E)	C/BOA	NAWC-AD : Lakehurst, NJ	3.519	0.733	Jan 2022	0.000		0.000		-		0.000	0.000	4.252	-
Developmental Test & Evaluation (DT&E)	C/CPFF	FEDSIM : Washington, DC	0.000	0.000		0.890	Feb 2023	0.600	Jan 2024	-		0.600	0.000	1.490	-
Subtotal			15.550	1.957		4.878		6.646		-		6.646	Continuing	Continuing	N/A

Remarks

Increase of \$0.928MM in Development Test & Evaluation (C/CPAF) / NSWC PD reflects an adjusted mix of FY24 test and evaluation projects. Increase of \$1.130M in Development Test & Evaluation (G/WR) / NSWC PD reflects an adjusted mix of FY24 test and evaluation projects. Decrease of \$0.290M for Developmental Test & Evaluation at FEDSIM reflects decreased testing of GENISYS requirements as the R&D ramps down.

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management Support	WR	NSWC Philadelphia : Philadelphia, PA	7.428	0.158	Nov 2021	0.196	Nov 2022	0.210	Nov 2023	-		0.210	0.000	7.992	-
Travel	Allot	NAVSEA HQ : Washington, DC	0.237	0.015	Dec 2021	0.015	Jan 2023	0.015	Mar 2024	-		0.015	0.000	0.282	-
Program Management Support	C/CPAF	NAVSEA HQ : Washington, DC	6.369	1.302	Jan 2022	1.463	Dec 2022	1.205	Jan 2024	-		1.205	0.000	10.339	-
Project Management Support	WR	NSWC Carderock : Bethesda, MD	1.174	0.177	Nov 2021	0.237	Nov 2022	0.510	Nov 2023	-		0.510	0.000	2.098	-
Program Management Support	C/CPFF	NSWC Corona : Corona, IN	0.000	0.000		0.000		0.500	Nov 2023	-		0.500	0.000	0.500	-
Subtotal			15.208	1.652		1.911		2.440		-		2.440	0.000	21.211	N/A

Remarks

Increase of \$0.014M for NSWC PD and \$0.273M NSWC CD in Project Management Support reflects management needs for new mix of FY24 projects. Decrease of \$0.258M for NAVSEA HQ reflects reduced overhead costs (taxes, contract fees, etc.) required for FY24 projects. Increase of \$0.5M for NSWC Corona Program Management Support reflects transfer of program management support to new contract.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023			
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program					Project (Number/Name) 0829 / ENERGY CONSERVATION (ADV)				
	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals	88.487	9.603		14.056		21.131		-		21.131	Continuing	Continuing	N/A	

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy												Date: March 2023					
Appropriation/Budget Activity 1319 / 4								R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program						Project (Number/Name) 0829 / ENERGY CONSERVATION (ADV)			

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
ENERGY CONSERVATION (ADV)																												
Proposal Development - FY22																												
Proposal Acceptance - FY22																												
Proposal Development - FY23																												
Proposal Acceptance - FY23																												
Proposal Development - FY24																												
Proposal Acceptance - FY24																												
Model & Simulation (if required)																												
Proposal Development																												
Prototype Acceptance																												
Proposal Developoment																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program		Project (Number/Name) 0829 / ENERGY CONSERVATION (ADV)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
ENERGY CONSERVATION (ADV)				
Proposal Development - FY22	1	2022	3	2022
Proposal Acceptance - FY22	4	2022	4	2022
Proposal Development - FY23	1	2023	3	2023
Proposal Acceptance - FY23	4	2023	4	2023
Proposal Development - FY24	1	2024	3	2024
Proposal Acceptance - FY24	4	2024	4	2024
Model & Simulation (if required)	1	2022	4	2023
Proposal Development	1	2025	3	2025
Prototype Acceptance	4	2025	4	2025
Proposal Developoment	1	2026	3	2026

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program				Project (Number/Name) 0838 / Mobility Fuels (ADV)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0838: Mobility Fuels (ADV)	122.718	9.030	7.442	6.491	-	6.491	8.463	8.365	8.049	8.211	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program represents the Navy's only RDTE investment designed to maintain and enhance its capability to operate as a "smart" customer for aviation and ship tactical fuels that are an operationally critical, single point of failure, \$4.0+ billion per year consumable requiring worldwide availability and interoperability.

Recent field problems have demonstrated the adverse effects that fuel-related problems can have on ship and aircraft performance, durability, and readiness. The potential risk and adverse operational impacts from fuel-related problems over the next decade, given the evolving production technologies, changing feedstocks, more stringent environmental regulations and the introduction of new operational requirements and platforms will continue to increase.

This program provides data and enables technology through laboratory, component, fuel system, engine, and platform tests. These evaluations relate the effects of changes in the Navy fuel properties and chemistry to the performance and durability of Naval ship, aircraft, ground and fuel distribution systems. The information is required by technical authorities and decision makers to: (a) assure interoperability with fuel procured from commercial/ international specifications, (b) determine the extent to which unnecessarily restrictive military specification requirements can be relaxed to reduce cost and increase availability worldwide, (c) provide guidance to fleet operators for the safe use of off-specification fuels or emerging CONOPS requiring the use of non-traditional fuels, (d) assure operational interoperability with evolving changes in fuel production technology, feedstocks, environmental regulations and tactical system demands, (e) improve the capability and reduce the cost of field fuel quality surveillance, and (f) facilitate rapid identification and resolution of field identified fuel deficiencies.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Naval Tactical Fuels	9.030	7.442	6.491	0.000	6.491
Articles:	-	-	-	-	-
Description: Perform development, test and evaluation work on Naval tactical fuels to: a) assure interoperability with commercial/international fuel specifications, b) determine the extent to which unnecessarily restrictive military specification features can be relaxed to reduce cost and increase availability worldwide; c) provide guidance to fleet operators for the safe use of off-specification or non-primary fuels , d) validate periodic changes to the Navy tactical fuel specifications to ensure fuel quality and avoid fleet operating problems while accommodating evolutionary changes in the fuel supply industry and e) improve fleet methods to ensure fuel quality and performance.					
FY 2023 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program		Project (Number/Name) 0838 / Mobility Fuels (ADV)		
<u>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</u>						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Continue to conduct lab, rig, component, and engine testing to assure fuel interoperability with evolving commercial fuel specifications and emerging operational and platform requirements. Refine advanced chemical composition measurement capability and enterprise data analytics tools that increase readiness through proactive stock protection and rapid safe-use determinations. Conduct field trials on prototype cost-reducing autonomous quality surveillance and contamination detection sensors.</p> <p><i>FY 2024 Base Plans:</i> Continue to conduct lab, rig, component, and engine testing to assure fuel interoperability with evolving commercial fuel specifications and emerging operational and platform requirements. Develop and trial modules to the Naval Fuel Data Analytics Tool adding hardware and non-specification test data to the fuel property and compositional modules already developed. Field trial additive detection capability in support of deployed additization requirements.</p> <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> FY24 decrease (\$0.951) is due to funding delays the field trial/approval of additive detection technology in support of the deployment of fuel additization capability.</p>						
Accomplishments/Planned Programs Subtotals		9.030	7.442	6.491	0.000	6.491
<u>C. Other Program Funding Summary (\$ in Millions)</u> N/A						
<u>Remarks</u>						
<u>D. Acquisition Strategy</u> Testing efforts will be competitively contracted, and performed under Cost Plus Fixed Fee and Firm Fixed Price contracts.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603724N / Navy Energy Program

Project (Number/Name)

0838 / Mobility Fuels (ADV)

Product Development (\$ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Systems Engineering	WR	NRL : Washington, D.C.	8.952	1.214	Nov 2021	1.165	Nov 2022	0.469	Nov 2023	-		0.469	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCAD : Patuxent River, MD	25.139	2.000	Nov 2021	2.000	Nov 2022	1.984	Nov 2023	-		1.984	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC : Philadelphia, PA	5.381	0.450	Nov 2021	0.500	Nov 2022	0.400	Nov 2023	-		0.400	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC : Bethesda, MD	0.462	0.000		0.000		0.000		-		0.000	0.000	0.462	0.462
Systems Engineering	C/FFP	Various : Various	4.756	2.298	Mar 2022	1.200	Jan 2023	0.660	Jun 2024	-		0.660	0.000	8.914	8.914
Prior year Prod Dev no longer funded in the FYDP	Various	Various : Various	0.161	0.000		0.000		0.000		-		0.000	0.000	0.161	0.161
Systems Engineering	MIPR	Army Ground Vehicle Systems Center : Warren, MI	0.000	0.500	Nov 2021	0.000		0.000		-		0.000	0.000	0.500	0.500
Systems Engineering	MIPR	AFRL : Dayton, OH	0.000	0.221	Nov 2021	0.000		0.000		-		0.000	0.000	0.221	0.221
Subtotal			44.851	6.683		4.865		3.513		-		3.513	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Developmental Test & Evaluation (DT&E)	WR	NAWCAD : Patuxent River, MD	6.349	0.500	Dec 2021	0.600	Nov 2022	0.500	Nov 2023	-		0.500	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	C/CPFF	Life Cycle Engineering : Charleston, SC	20.923	1.500	Apr 2022	1.614	Mar 2023	2.028	Mar 2024	-		2.028	0.000	26.065	26.065
Developmental Test & Evaluation (DT&E)	C/CPFF	Univ of Dayton Research Inst : Dayton, OH	1.289	0.000		0.000		0.000		-		0.000	0.000	1.289	1.289
Developmental Test & Evaluation (DT&E)	WR	US Naval Academy : Annapolis, MD	0.188	0.040	Apr 2022	0.040	May 2023	0.100	May 2024	-		0.100	0.000	0.368	0.368
Developmental Test & Evaluation (DT&E)	C/FFP	Various : Various	7.826	0.000		0.000		0.000		-		0.000	0.000	7.826	7.826

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program				Project (Number/Name) 0838 / Mobility Fuels (ADV)					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	MIPR	DLA-Energy : Ft. Belvoir, VA	0.722	0.030	Apr 2022	0.038	Mar 2023	0.040	May 2024	-		0.040	0.000	0.830	0.830
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	Various	Various : Various	31.545	0.000		0.000		0.000		-		0.000	0.000	31.545	31.545
Subtotal			68.842	2.070		2.292		2.668		-		2.668	Continuing	Continuing	N/A
Remarks All prior year lines have been consolidated.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Patuxent River, MD	2.319	0.267	Dec 2021	0.270	Nov 2022	0.300	Oct 2023	-		0.300	Continuing	Continuing	Continuing
Program Management Support	C/FFP	Coord Research Council : Alpharetta, GA	0.090	0.010	Nov 2021	0.015	Dec 2022	0.010	Oct 2023	-		0.010	0.000	0.125	0.125
Prior year Mgmt Supp no longer funded in the FYDP	Various	Various : Various	6.616	0.000		0.000		0.000		-		0.000	0.000	6.616	6.616
Subtotal			9.025	0.277		0.285		0.310		-		0.310	Continuing	Continuing	N/A
Remarks 1.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			122.718	9.030		7.442		6.491		-		6.491	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0603724N / Navy Energy Program

Project (Number/Name)
0838 / Mobility Fuels (ADV)

Mobility Fuels (ADV)	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Fuel Quality Surveillance/Analysis																												
	Advance Chemical Composition Detection Technology																											
	Deployable Fuel Property/Chemical Sensors																											
Mitigation of Field Identified Deficiencies																												
	Advance Chemical Composition Detection																											
	Enterprise Rapid Assessment Data Analytics																											
Emerging platform/CONOPS fuel interoperability																												
	Conduct rig , component and hardware platform testing																											
Maintain operational compatibility with Commercial and International Fuel Specifications																												
	Lab, Rig, Component and Platform Testing																											

2024DON - 0603724N - 0838

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program	Project (Number/Name) 0838 / Mobility Fuels (ADV)	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Mobility Fuels (ADV)</i>				
Fuel Quality Surveillance/Analysis: Advance Chemical Composition Detection Technology	1	2022	4	2024
Fuel Quality Surveillance/Analysis: Deployable Fuel Property/Chemical Sensors	1	2022	4	2028
Mitigation of Field Identified Deficiencies: Advance Chemical Composition Detection	1	2022	4	2028
Mitigation of Field Identified Deficiencies: Enterprise Rapid Assessment Data Analytics	1	2022	4	2026
Emerging platform/CONOPS fuel interoperability: Conduct rig, component and hardware platform testing	1	2022	4	2028
Maintain operational compatibility with Commercial and International Fuel Specifications: Lab, Rig, Component and Platform Testing	1	2022	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program				Project (Number/Name) 0928 / Shore Energy Technology			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0928: Shore Energy Technology	59.021	1.910	1.981	2.059	-	2.059	2.111	2.155	2.199	2.244	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Legislation, Executive Orders (EO), and SECNAV Guidance direct DoN to increase energy security through resiliency, efficiency, reliability, cybersecurity and alternative energy sources. This guidance includes the National Defense Strategy (NDS) of 2018, A Design for Maintaining Maritime Superiority 2.0, and the NAVFAC Strategic Design 2.0. Guidance directs DOD to posture logistics capability (projected from Navy Installations) ashore and at sea in ways that allow the fleet to operate globally, at a pace that can be sustained over time. Improved resilience of our installations (employing key technology focus areas defined in the NDS) will enable platform refueling, re-arming, resupply and repair. Installations shall enable Dynamic Force Employment and Distributed Lethality.

This Energy RDT&E Project will test, evaluate, and validate components as well as demonstrate cost-effective and technical viability of energy security , efficiency, resilience, reliability, and technologies. All efforts will be coordinated across DOD and with other agencies as appropriate. Specifically, this project aims to pursue three areas of development, testing and evaluation: (A) Modeling and possible prototype testing of new energy sources for use at Naval installations with potential for widespread applicability to energy security; (B) It will support demonstration and validation of advanced electric grid management systems, known as "Smart Grid" and "Micro Grid" technology, for use at Naval installations to enable improved energy security; (C) Demonstration and Validation of Alternative Energy, Energy Efficiency, and Resiliency and Smart Energy Management Technology. Cyber Security resilience technology shall align to NIST 800-82 and be interoperable within the NAVFAC cybersecurity enclave.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Shore Energy Technology	1.910	1.981	2.059	0.000	2.059
Articles:	-	-	-	-	-
FY 2023 Plans: - Continue development and demonstration of energy storage sites to include cyber security measures. - Continue development and demonstration of adaptable microgrids that utilize artificial intelligence and solid-state power electronics using renewable energy test bed. - Continue development and demonstration of predictive modeling, neural network, and predictive energy tools.					
FY 2024 Base Plans: - Develop and demonstrate energy storage sites to include cyber security measures. - Develop and demonstrate adaptable microgrids that utilize artificial intelligence and solid-state power electronics using renewable energy test bed.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program		Project (Number/Name) 0928 / Shore Energy Technology		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Develop and demonstrate predictive modeling, neural network, and predictive energy tools.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: FY24 increase (\$0.078M) supports additional investment in demonstration of advanced energy collection and energy storage technologies.						
Accomplishments/Planned Programs Subtotals		1.910	1.981	2.059	0.000	2.059
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy Demonstration and validation are conducted for maximum transfer and interaction with industry such as to influence the industry COTS with the results of this demonstration and prototype validation. Acquisition is based on performance specifications enabled by this project.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program				Project (Number/Name) 0928 / Shore Energy Technology					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Renewable Energy	WR	EXWC : Port Hueneme, CA	42.327	0.393	Jan 2022	0.416	Jan 2023	0.425	Dec 2023	-		0.425	Continuing	Continuing	Continuing
Energy Resiliency and Reliability, Security and Systems (Includes cybersecurity)	Various	EXWC : Port Hueneme, CA	9.914	0.730	Dec 2021	0.700	Jan 2023	0.724	Dec 2023	-		0.724	Continuing	Continuing	Continuing
Energy Storage	WR	EXWC : Port Hueneme, CA	6.577	0.515	Dec 2021	0.515	Jan 2023	0.540	Jan 2024	-		0.540	Continuing	Continuing	Continuing
Renewable Energy (Direct Cite)	Various	EXWC : Port Hueneme, CA	0.203	0.272	Dec 2021	0.000		0.000		-		0.000	0.000	0.475	-
Energy Resiliency and Reliability, Security and Systems (includes cybersecurity) - Direct Cite	Various	EXWC : Port Hueneme, CA	0.000	0.000		0.350	Apr 2023	0.370	Apr 2024	-		0.370	Continuing	Continuing	Continuing
Subtotal			59.021	1.910		1.981		2.059		-		2.059	Continuing	Continuing	N/A
Remarks															
- All categories: slight increase across all category items in FY24 due to budget increase.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			59.021	1.910		1.981		2.059		-		2.059	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																Date: March 2023			
Appropriation/Budget Activity								R-1 Program Element (Number/Name)								Project (Number/Name)			
1319 / 4								PE 0603724N / Navy Energy Program								0928 / Shore Energy Technology			

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Renewable Energy																												
Renewable Energy																												
Energy Resiliency and Reliability, Security and Systems (Includes Cybersecurity)																												
Energy Resiliency and Reliability, Security and Systems (Includes Cybersecurity)																												
Energy Storage																												
Energy Storage																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program	Project (Number/Name) 0928 / Shore Energy Technology	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Renewable Energy				
Renewable Energy	1	2022	4	2028
Energy Resiliency and Reliability, Security and Systems (Includes Cybersecurity)				
Energy Resiliency and Reliability, Security and Systems (Includes Cybersecurity)	1	2022	4	2028
Energy Storage				
Energy Storage	1	2022	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy									Date: March 2023			
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program				Project (Number/Name) 0996 / Aircraft Energy Conservation			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0996: Aircraft Energy Conservation	177.643	6.863	26.203	30.419	-	30.419	22.905	16.906	17.019	17.362	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Naval aviation must operate independently worldwide often with limited logistics support. Additionally, legacy and emerging aircraft continually add capability to enhance their lethality and survivability. Improving an aircraft's utilization and management of energy has a direct relationship to enhanced combat capability to meet the challenges of emerging threats. This program engages technical experts from across Naval aviation, industry, and academia to identify best practices and technologies for development, testing and validation to determine technical viability and assess benefit to mission capability.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)							FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	
<p>Title: Aircraft Operational Energy</p> <p>Articles:</p> <p>FY 2023 Plans:</p> <p>Continue identification, testing and assessment of Operational Energy technologies, best practices and metrics to enhance Naval Aviation operational capability. Build and validate integrated models to identify and support resolution of legacy aircraft power and thermal management challenges. Conduct certification testing of common safe and affordable lithium ion battery prototypes. Develop/mature advanced aircraft generator technology. Conduct test cell evaluation of engine recuperator technology for UAS applications. Mature and demonstrate operational benefits of finlet and aerial refueling technologies. Assess and mature engine component efficiency technologies</p> <p>FY 2024 Base Plans:</p> <p>Continue identification, testing and assessment of Operational Energy technologies to enhance Naval Aviation operational capability. Build and validate integrated models to identify and support resolution of legacy aircraft power and thermal management challenges. Conduct certification testing of common safe and affordable lithium ion battery prototypes. Mature and demonstrate operational energy benefits of P-8 finlet and aerial refueling technologies. Assess and mature engine component efficiency technologies. Develop and mature novel engine inlet particle separation.</p> <p>FY 2024 OCO Plans:</p> <p>N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>							6.863	26.203	30.419	0.000	30.419	
							-	-	-	-	-	

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program		Project (Number/Name) 0996 / Aircraft Energy Conservation		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
FY24 increase (\$4.216M) supports P-8 Flight testing and accelerates development of advance aerial refueling stabilization technologies.						
Accomplishments/Planned Programs Subtotals		6.863	26.203	30.419	0.000	30.419
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
This is a non-acquisition program that develops, evaluates, and validates technologies in support of Navy Operational Energy goals for increasing aircraft mission capability.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program	Project (Number/Name) 0996 / Aircraft Energy Conservation
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCAD : Patuxent River, MD	13.226	2.328	Dec 2021	3.600	Dec 2022	4.061	Dec 2023	-		4.061	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	The Boeing Company : Seattle, WA	2.000	0.000		0.000		0.000		-		0.000	0.000	2.000	2.000
Systems Engineering	C/CPFF	Various : Various	17.396	2.884	Apr 2022	17.403	May 2023	7.000	Mar 2024	-		7.000	0.000	44.683	44.683
Systems Engineering	C/BA	Deloitte Consulting : Alexandria, VA	4.571	1.100	Jan 2022	0.000		0.000		-		0.000	0.000	5.671	5.671
Systems Engineering-Prior Years	Various	Various : Various	3.612	0.000		0.000		7.000	Jun 2024	-		7.000	0.000	10.612	10.612
Systems Engineering	WR	Naval Research Lab : Washington DC	0.000	0.000		0.400	Dec 2022	0.408	Dec 2023	-		0.408	0.000	0.808	0.808
Systems Engineering	C/CPFF	Air Force Research Lab : Wright Patterson AFB, Ohio	0.000	0.000		0.250	Dec 2022	0.250	Dec 2023	-		0.250	0.000	0.500	0.500
Systems Engineering	C/CPFF	GE Aviation : Cincinnati, Ohio	0.000	0.000		0.750	Mar 2023	2.300	Dec 2023	-		2.300	0.000	3.050	3.050
Systems Engineering	C/CPFF	Creare : Hanover, NH	0.000	0.000		0.400	Nov 2022	0.000		-		0.000	0.000	0.400	0.400
Systems Engineering	C/CPFF	Vortex Controls Technologies : TBD	0.000	0.000		0.000		2.500	Mar 2024	-		2.500	0.000	2.500	2.500
Subtotal			40.805	6.312		22.803		23.519		-		23.519	Continuing	Continuing	N/A

Remarks

5. All Prior Year lines have been consolidated.

Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NAWCAD : Patuxent River, MD	7.536	0.201	Dec 2021	1.500	Dec 2022	3.000	Mar 2024	-		3.000	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program				Project (Number/Name) 0996 / Aircraft Energy Conservation					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	C/CPFF	Various : Various	4.740	0.000		0.000		2.000	Dec 2023	-		2.000	0.000	6.740	6.740
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	Various	Various : Various	117.125	0.000		0.000		0.000		-		0.000	0.000	117.125	117.125
Developmental Test & Evaluation (DT&E)	WR	NSWC : Crane, IN	0.000	0.000		0.500	Dec 2022	0.500	Dec 2023	-		0.500	0.000	1.000	1.000
Developmental Test & Evaluation (DT&E)	C/CPFF	EIC Laboratories : Norwood, MA	0.000	0.000		0.750	Mar 2023	0.750	Mar 2024	-		0.750	0.000	1.500	1.500
Subtotal			129.401	0.201		2.750		6.250		-		6.250	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Patuxent River, MD	2.925	0.350	Dec 2021	0.650	Dec 2022	0.650	Dec 2023	-		0.650	Continuing	Continuing	Continuing
Prog Mgmt no longer funded in the FYDP	Various	Various : Various	4.512	0.000		0.000		0.000		-		0.000	0.000	4.512	4.512
Subtotal			7.437	0.350		0.650		0.650		-		0.650	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			177.643	6.863		26.203		30.419		-		30.419	Continuing	Continuing	N/A
Remarks															

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program	Project (Number/Name) 0996 / Aircraft Energy Conservation
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Aircraft Energy Conservation	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Air ENCOM Program																												
	Aircraft Dashboard																											
	Operational Energy Modeling																											
Air Vehicle Energy Efficiency RDT&E																												
	Common Affordable Safe Energy Storage Batteries																											
	Advanced Thermal Management																											
	Advanced Fuel Cells for UAS Applications																											
	Technology Assessments																											
Engine Efficiency RDT&E																												
	Turbine Engine Recuperator for UAS Applications																											
	Advanced Component Technology																											
	Technology Assessments																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program	Project (Number/Name) 0996 / Aircraft Energy Conservation	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Aircraft Energy Conservation</i>				
Air ENCOM Program: Aircraft Dashboard	1	2022	4	2022
Air ENCOM Program: Operational Energy Modeling	1	2022	4	2025
Air Vehicle Energy Efficiency RDT&E: Common Affordable Safe Energy Storage Batteries	1	2022	4	2024
Air Vehicle Energy Efficiency RDT&E: Advanced Thermal Management	1	2022	4	2027
Air Vehicle Energy Efficiency RDT&E: Advanced Fuel Cells for UAS Applications	1	2022	4	2024
Air Vehicle Energy Efficiency RDT&E: Air Vehicle Energy Technology Assessments	1	2022	4	2028
Engine Efficiency RDT&E: Turbine Engine Recuperator for UAS Applications	1	2022	4	2028
Engine Efficiency RDT&E: Advanced Engine Component Technology	1	2022	4	2028
Engine Efficiency RDT&E: Technology Assessments	1	2022	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program				Project (Number/Name) 2566 / Battery Development and Safety			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2566: Battery Development and Safety	0.000	4.290	10.638	12.114	-	12.114	11.668	8.552	7.092	7.683	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Provide Program Management Support for Battery Development and Safety program.

A. Mission Description and Budget Item Justification

1) Provide an advanced battery database with standard battery families for program offices to use to allow for selection of batteries early in the design process increasing the likelihood of design and fielding success, 2) leverage the battery database to begin common battery design efforts to save cost, 3) establish common battery standards and design requirements (e.g., propagation resistant designs, standard battery monitoring and casualty detection systems, etc.) to make advanced batteries safer and therefore deployable, 4) develop and test standard battery storage/container systems that can safely house batteries and withstand catastrophic failure (thermal runaway) of the batteries within the container while minimizing damage to surrounding equipment and platforms, 5) streamline the battery safety certification process especially for high energy storage magazines and other large battery designs (lasers) to allow battery based weapon systems to be fielded in time to support strategic needs, 6) develop hazard mitigation technologies to support rapid safe deployment of advanced batteries to support weapon systems, 7) generate analytics that characterize the Department's current and projected energy/advanced battery needs, 8) establish the Navy's contribution to DoD and cross-service advanced battery supply chain efforts.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Battery Development and Safety	4.290	10.638	12.114	0.000	12.114
Articles:	-	-	-	-	-
Description: Provide Program Management Support for Battery Development and Safety program.					
FY 2023 Plans:					
FY23 plans consist of the following actions:					
1) Provide an advanced battery database with standard battery families for program offices to use to allow for selection of batteries early in the design process increasing the likelihood of design and fielding success					
2) leverage the battery database to begin common battery design efforts to save cost					
3) establish common battery standards and design requirements (e.g., propagation resistant designs, standard battery monitoring and casualty detection systems, etc.) to make advanced batteries safer and therefore deployable					
4) develop and test standard battery storage/container systems that can safely house batteries and withstand catastrophic failure (thermal runaway) of the batteries within the container while minimizing damage to					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program		Project (Number/Name) 2566 / Battery Development and Safety		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>surrounding equipment and platforms5) streamline the battery safety certification process especially for high energy storage magazines and other large battery designs (lasers) to allow battery based weapon systems to be fielded in time to support strategic needs, 6) develop hazard mitigation technologies to support rapid safe deployment of advanced batteries to support weapon systems, 7) generate analytics that characterize the Department's current and projected energy/advanced battery needs, 8) establish the Navy's contribution to DoD and cross-service advanced battery supply chain efforts.</p> <p><i>FY 2024 Base Plans:</i> FY24 plans consist of the following actions: 1) streamline and accelerate the battery certification process through conducting an independent assessment of the process to inform process and capability improvements, 2) establish common battery standards and design requirements to make advanced batteries safer and affordable through commonality, 3) develop hazard mitigation technologies to support rapid safe deployment of advanced batteries to support weapon systems, 4) generate analytics that characterize the Department's current and projected energy/advanced battery needs, 5) establish the Navy's contribution to DoD and cross service advanced battery supply chain efforts, and 6) leverage and expand the battery database to begin common battery design efforts to save cost. 7) generate analytics that characterize the Department's current and projected energy/advanced battery needs, 8) establish the Navy's contribution to DoD and cross service advanced battery supply chain efforts.</p> <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> FY24 increase (\$1.476M) is due to addition of electric vehicle battery Jumpstart initiative.</p>						
Accomplishments/Planned Programs Subtotals		4.290	10.638	12.114	0.000	12.114
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
RDT&E Contracts are Competitive Procurements.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program				Project (Number/Name) 2566 / Battery Development and Safety					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Development	WR	NSWC PD : Philadelphia, PA	0.000	0.319	Apr 2022	0.931	Nov 2022	0.326	Nov 2023	-		0.326	Continuing	Continuing	Continuing
Primary Hardware Development	WR	NSWC CD : Bethesda, MD	0.000	0.418	Apr 2022	1.005	Nov 2022	0.326	Nov 2023	-		0.326	Continuing	Continuing	Continuing
Engineering Development	WR	NSWC CD : Bethesda, MD	0.000	0.091	Apr 2022	0.343	Nov 2022	0.305	Nov 2023	-		0.305	Continuing	Continuing	Continuing
Demonstration & Evaluation	WR	NSWC CD : Bethesda, MD	0.000	0.090	Apr 2022	0.343	Nov 2022	0.248	Nov 2023	-		0.248	Continuing	Continuing	Continuing
System Development	C/BOA	NAWC-AD : Lakehurst, NJ	0.000	0.166	May 2022	0.539	Nov 2022	0.106	Nov 2023	-		0.106	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC DD : Dahlgren, VA	0.000	0.158	Jan 2023	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Primary Hardware Development	WR	NSWC CR : Crane, Indiana	0.000	0.000		0.000		0.106	Nov 2023	-		0.106	0.000	0.106	-
Engineering Development	WR	NSWC CR : Crane, Indiana	0.000	0.000		0.000		0.234	Nov 2023	-		0.234	0.000	0.234	-
Demonstration and Evaluation	WR	NSWC CR : Crane, Indiana	0.000	0.000		0.000		0.094	Nov 2023	-		0.094	0.000	0.094	-
Engineering Development	MIPR	General Technical Services, LLC : Wall Township, NJ	0.000	0.000		0.000		1.517	Nov 2023	-		1.517	0.000	1.517	-
Primary Hardware Development	MIPR	ManTech International Corporation : Herndon, VA	0.000	0.000		0.000		1.732	Nov 2023	-		1.732	0.000	1.732	-
Subtotal			0.000	1.242		3.161		4.994		-		4.994	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	NSWC CD : Bethesda, MD	0.000	0.319	Apr 2022	0.931	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603724N / Navy Energy Program

Project (Number/Name)

2566 / Battery Development and Safety

Support (\$ in Millions)

				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Study Analysis	WR	NSWC CD : Bethesda, MD	0.000	0.476	Apr 2022	0.931	Nov 2022	0.362	Nov 2023	-		0.362	Continuing	Continuing	Continuing
Development Support	C/CPAF	NSWC PD : Philadelphia, PA	0.000	0.319	May 2022	0.931	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Development Support	WR	NSWC PD : Philadelphia, PA	0.000	0.166	Apr 2022	0.587	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Study Analysis	WR	NSWC CR : Crane, Indiana	0.000	0.000		0.000		0.819	Nov 2023	-		0.819	0.000	0.819	-
Study Analysis	MIPR	General Technical Services, LLC : Wall Township, NJ	0.000	0.000		0.000		1.618	Nov 2023	-		1.618	0.000	1.618	-
Study Analysis	MIPR	The MITRE Corporation : McLean, VA	0.000	0.000		0.000		0.306	Nov 2023	-		0.306	0.000	0.306	-
Development Support	MIPR	DTIC : Fort Belvoir, VA	0.000	0.000		0.000		0.106	Nov 2023	-		0.106	0.000	0.106	-
Subtotal			0.000	1.280		3.380		3.211		-		3.211	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)

				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NSWC CD : Bethesda, MD	0.000	0.382	Apr 2022	0.823	Jan 2023	0.648	Nov 2023	-		0.648	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	WR	NSWC CD : Bethesda, MD	0.000	0.318	Apr 2022	0.823	Jan 2023	0.648	Nov 2023	-		0.648	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	WR	NAWC-AD : Paxtuxtent, MD	0.000	0.200	May 2022	0.500	Feb 2023	0.505	Nov 2023	-		0.505	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	WR	NSWC CR : Crane, IN	0.000	0.200	Apr 2022	0.500	Nov 2022	0.476	Nov 2023	-		0.476	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NSWC CR : Crane, IN	0.000	0.434	Apr 2022	0.686	Nov 2022	0.477	Nov 2023	-		0.477	Continuing	Continuing	Continuing
Subtotal			0.000	1.534		3.332		2.754		-		2.754	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program				Project (Number/Name) 2566 / Battery Development and Safety					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NSWC PD : Philadelphia, PA	0.000	0.076	Apr 2022	0.196	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Travel	Allot	NAVSEA HQ : Washington, DC	0.000	0.022	Apr 2022	0.059	Jan 2023	0.031	Nov 2023	-		0.031	Continuing	Continuing	Continuing
Total Assets	WR	NSWC CD : Bethesda, MD	0.000	0.090	Apr 2022	0.391	Feb 2023	0.000		-		0.000	Continuing	Continuing	Continuing
Program Management Support	WR	NSWC CD : Bethesda, MD	0.000	0.046	Apr 2022	0.119	Dec 2022	0.305	Nov 2023	-		0.305	Continuing	Continuing	Continuing
Program Management Support	C/CPFF	Serco Inc. : Herndon, VA	0.000	0.000		0.000		0.819	Nov 2023	-		0.819	0.000	0.819	-
Subtotal			0.000	0.234		0.765		1.155		-		1.155	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	4.290		10.638		12.114		-		12.114	Continuing	Continuing	N/A
Remarks															

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PE 0603724N: *Navy Energy Program*
Navy

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Project (Number/Name)	Start Date	End Date	Duration (Days)	Team Lead	Status	Progress (%)	Budget (USD)	Actual Cost (USD)	Variance (USD)	Risk Level	Notes
101	2023-01-01	2023-03-31	90	John Doe	Completed	100	15000	14800	200	Low	Project completed ahead of schedule.
102	2023-02-01	2023-05-31	120	Jane Smith	In Progress	75	20000	21000	-1000	Medium	Minor budget overrun, on track for completion.
103	2023-03-01	2023-06-30	120	Mike Johnson	On Hold	20	18000	18000	0	High	Project paused due to resource allocation.
104	2023-04-01	2023-07-31	120	Sarah Lee	Planned	0	22000	22000	0	Medium	Project planning phase.
105	2023-05-01	2023-08-31	120	David Kim	On Hold	10	19000	19000	0	Low	Project paused due to budget review.
106	2023-06-01	2023-09-30	120	Emily White	Planned	0	21000	21000	0	Medium	Project planning phase.
107	2023-07-01	2023-10-31	120	Chris Brown	On Hold	5	20000	20000	0	High	Project paused due to strategic review.
108	2023-08-01	2023-11-30	120	Alex Green	Planned	0	23000	23000	0	Medium	Project planning phase.
109	2023-09-01	2023-12-31	120	Olivia Black	On Hold	0	17000	17000	0	Low	Project paused due to resource allocation.
110	2023-10-01	2024-01-31	120	Noah Grey	Planned	0	24000	24000	0	Medium	Project planning phase.
111	2023-11-01	2024-02-28	118	Isabella Blue	On Hold	0	16000	16000	0	Low	Project paused due to budget review.
112	2023-12-01	2024-03-31	120	Liam Red	Planned	0	25000	25000	0	Medium	Project planning phase.
113	2024-01-01	2024-04-30	120	Mia Purple	On Hold	0	18000	18000	0	Low	Project paused due to resource allocation.
114	2024-02-01	2024-05-31	120	Benjamin Yellow	Planned	0	26000	26000	0	Medium	Project planning phase.
115	2024-03-01	2024-06-30	120	Charlotte Pink	On Hold	0	19000	19000	0	Low	Project paused due to budget review.
116	2024-04-01	2024-07-31	120	Ethan Orange	Planned	0	27000	27000	0	Medium	Project planning phase.
117	2024-05-01	2024-08-31	120	Ava Green	On Hold	0	20000	20000	0	Low	Project paused due to resource allocation.
118	2024-06-01	2024-09-30	120	Lucas Blue	Planned	0	28000	28000	0	Medium	Project planning phase.
119	2024-07-01	2024-10-31	120	Sophia Red	On Hold	0	21000	21000	0	Low	Project paused due to budget review.
120	2024-08-01	2024-11-30	120	Mason Purple	Planned	0	29000	29000	0	Medium	Project planning phase.
121	2024-09-01	2024-12-31	120	Ella Yellow	On Hold	0	22000	22000	0	Low	Project paused due to resource allocation.
122	2024-10-01	2025-01-31	120	Leo Green	Planned	0	30000	30000	0	Medium	Project planning phase.
123	2024-11-01	2025-02-28	118	Aria Blue	On Hold	0	23000	23000	0	Low	Project paused due to budget review.
124	2024-12-01	2025-03-31	120	Oliver Red	Planned	0	31000	31000	0	Medium	Project planning phase.
125	2025-01-01	2025-04-30	120	Scarlett Purple	On Hold	0	24000	24000	0	Low	Project paused due to resource allocation.
126	2025-02-01	2025-05-31	120	Jack Yellow	Planned	0	32000	32000	0	Medium	Project planning phase.
127	2025-03-01	2025-06-30	120	Chloe Pink	On Hold	0	25000	25000	0	Low	Project paused due to budget review.
128	2025-04-01	2025-07-31	120	Henry Orange	Planned	0	33000	33000	0	Medium	Project planning phase.
129	2025-05-01	2025-08-31	120	Amelia Green	On Hold	0	26000	26000	0	Low	Project paused due to resource allocation.
130	2025-06-01	2025-09-30	120	William Blue	Planned	0	34000	34000	0	Medium	Project planning phase.
131	2025-07-01	2025-10-31	120	Harper Red	On Hold	0	27000	27000	0	Low	Project paused due to budget review.
132	2025-08-01										

PE 0603724N / Navy Energy Program

2566 / Battery Development and Safety

[illegible]

2024PB - 0603724N - 2566

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program	Project (Number/Name) 2566 / Battery Development and Safety	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2566				
Establish and expand the Standard Family of Battery Database:	3	2022	2	2025
Streamline the Battery Safety Certification Process:	3	2022	4	2025
Establish Common Battery Standards and Requirements:	3	2022	4	2028
Develop and Test Standard Battery Storage/Container Systems:	3	2022	4	2025
Design efforts for rapid safe deployment of advanced batteries to support weapon systems:	1	2023	4	2028
Generate analytics that characterize the Department's current and projected energy/advanced battery needs.:	1	2023	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program				Project (Number/Name) 9999 / Congressional Adds			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: Congressional Adds	117.904	33.295	15.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	166.199
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Note C545 belongs to BSO52												
A. Mission Description and Budget Item Justification FY2023 Congressional Add (\$10.000M) for C545 - Marine System Sensors Microgrids (BSO 52) FY2023 Congressional Add (\$5.000M) for C875 - Navy Energy Systems												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2022	FY 2023			
Congressional Add: Marine energy systems for sensors and microgrids								10.136	10.000			
FY 2022 Accomplishments: Commenced work on Marine energy systems for sensors and microgrids Congressional Add.												
FY 2023 Plans: N/A												
Congressional Add: Navy energy program								14.471	0.000			
FY 2022 Accomplishments: NAVY ENERGY PROGRAM increases RDT&E investment to address challenges posed by contested logistics environments and energy supply chains to include fuels and energy storage, technologies for energy demand reduction, energy monitoring, and platform reach/endurance.												
FY 2023 Plans: N/A												
Congressional Add: Cargo drone family of advanced batteries								8.688	0.000			
FY 2022 Accomplishments: Commenced work on Congressional Add for Cargo drone family of advanced batteries.												
FY 2023 Plans: N/A												
Congressional Add: Navy energy systems								0.000	5.000			
FY 2022 Accomplishments: N/A												
FY 2023 Plans: Navy energy systems development.												
Congressional Adds Subtotals								33.295	15.000			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program	Project (Number/Name) 9999 / Congressional Adds
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy RDTEN Contracts are Competitive Procurements		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program				Project (Number/Name) 9999 / Congressional Adds					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior year Congressional Adds	Various	Various : Various	71.585	0.000		0.000		0.000		-		0.000	0.000	71.585	-
Battery Development and Safety Enterprise	TBD	TBD : TBD	28.319	0.000		0.000		0.000		-		0.000	0.000	28.319	-
C492 - Natural Gas Technologies	Various	EXWC : Port Hueneme, CA	7.500	0.000		0.000		0.000		-		0.000	0.000	7.500	-
C671 - System Sensors Microgrids	Various	EXWC : Port Hueneme, CA	10.500	0.000		0.000		0.000		-		0.000	0.000	10.500	-
C758 - Navy Energy Program	Various	TBD : TBD	0.000	7.116	Sep 2022	0.000		0.000		-		0.000	0.000	7.116	-
C782-Cargo Family Drone Battery	WR	NAWC/AD : Pax River, MD	0.000	1.500	Apr 2022	0.000		0.000		-		0.000	0.000	1.500	-
C545 - Marine Energy Converters	Various	TBD : TBD	0.000	10.136	Aug 2022	10.000	Aug 2023	0.000		-		0.000	0.000	20.136	-
C782-Cargo Family Drone Battery	SS/BA	Packet Digital : ND	0.000	7.188	Jul 2022	0.000		0.000		-		0.000	0.000	7.188	-
C758 - Navy Energy Program H2 Stalker Increment	Various	Various : Various	0.000	2.625	Jul 2022	0.000		0.000		-		0.000	0.000	2.625	-
C758- Navy Energy Program CH-53K Hybrid Inlet	Various	various : various	0.000	2.600	Jun 2022	0.000		0.000		-		0.000	0.000	2.600	-
C758 - Navy Energy Program Improved Lith. Battery SOC,SOH	Various	various : various	0.000	0.260	Aug 2022	0.000		0.000		-		0.000	0.000	0.260	-
C758 - Navy Energy Program Drouge Stabilization	Various	various : various	0.000	1.870	Jul 2022	0.000		0.000		-		0.000	0.000	1.870	-
C875 Navy Energy Systems	Various	various : varous	0.000	0.000		5.000	Sep 2024	0.000		-		0.000	0.000	5.000	-
Subtotal			117.904	33.295		15.000		0.000		-		0.000	0.000	166.199	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program					Project (Number/Name) 9999 / Congressional Adds			
	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	117.904	33.295		15.000		0.000		-		0.000	0.000	166.199	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																						Date: March 2023							
Appropriation/Budget Activity 1319 / 4												R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program								Project (Number/Name) 9999 / Congressional Adds									
Proj 9999		FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
		1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
Hydrokinetic Energy Research & Development																													
Installation Energy Efficiency Enhancements		Project C492 - Natural Gas Technologies																											
		Project C671 - System Sensors Microgrids																											
Battery Development and Safety Enterprise																													
		Battery Development and Safety Enterprise																											
Congressional Adds																													
		C758 - Navy Energy Program																											
		C761 Marine Energy Converter																											
		C782 Cargo Family Drone				C875 Navy Energy Systems																							

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603724N / Navy Energy Program	Project (Number/Name) 9999 / Congressional Adds	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
Hydrokinetic Energy Research & Development: Installation Energy Efficiency Enhancements: Project C492 - Natural Gas Technologies	1	2022	1	2026
Hydrokinetic Energy Research & Development: Installation Energy Efficiency Enhancements: Project C671 - System Sensors Microgrids	1	2022	1	2026
Battery Development and Safety Enterprise: Battery Development and Safety Enterprise	1	2022	4	2028
Congressional Adds: C758 - Navy Energy Program	1	2022	4	2022
Congressional Adds: C545 Marine Energy Converter	1	2022	4	2024
Congressional Adds: C782 Cargo Family Drone Battery	1	2022	4	2022
Congressional Adds: C875 Navy Energy Systems	2	2023	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603725N / Facilities Improvement							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	29.149	6.306	5.664	10.149	-	10.149	7.817	7.364	7.252	7.402	Continuing	Continuing
0995: Naval Facilities System	19.260	2.132	1.993	2.192	-	2.192	2.517	2.441	2.409	2.459	Continuing	Continuing
3018: Facilities Related Controls Systems (FRCS) Cybersecurity RDTE	1.250	3.237	2.829	6.462	-	6.462	3.820	3.617	3.545	3.619	Continuing	Continuing
3155: Force Protection Ashore	8.639	0.937	0.842	1.495	-	1.495	1.480	1.306	1.298	1.324	Continuing	Continuing

A. Mission Description and Budget Item Justification

Mission Description and Budget Item Justification:

This program provides for capabilities to: a) overcome performance limitations and reduce the life cycle cost of shore facilities and, b) provide protection against terrorist attacks for shore installations and their operations. The program focuses on technical and operational issues of specific Navy interest, where there are no unbiased test validated Commercial Off the Shelf (COTS) solutions available, and where timely capabilities may not materialize without specific demonstration or validation by the Navy. Additionally, the program completes the development of technologies originating from Navy, DOD and other sources of Science and Technology programs, including the National Science Foundation (NSF), the National Institute of Standards and Technology (NIST) and Department of Energy (DOE). Validated technologies are implemented in the Navy's Military Construction (MILCON) and Facilities, Sustainment Restoration and Modernization (FSRM) program, and Antiterrorism and Force Protection (ATFP) Other Procurement, Navy (OP,N) program.

Naval Facilities System Project 0995 addresses Facilities Sustainment, Restoration and Modernization for reducing the total ownership cost (TOC) of future and existing Facilities and addressing natural and catastrophic risk of critical Naval Waterfront Facilities.

Project 3018: Facilities Related Controls Systems (FRCS) Cybersecurity RDTE. The Cyber Vulnerability Assessments and Evaluations program funds cyber vulnerability assessments of critical shore infrastructure as directed by Section 1650 of the FY17 National Defense Authorization Act (NDAA). Funding will be used for assessments of prioritized critical shore infrastructure. Sec. 1650 of the FY17 NDAA directs the Secretary of Defense to submit a plan for assessing the cyber vulnerability of critical defense infrastructure and begin assessment of this infrastructure during a preliminary pilot program that will assess no fewer than two installations by December, 31 2019. Funded vulnerability assessments will end by calendar year 2020 and will build upon existing mission assurance, blue team, and red team capabilities. As instructed by the Congressional language, the assessments will utilize DoE and DoD national laboratory partnerships. Assessments will end with the submission of a final report to Congress. Strategies and procedures for mitigating the risk of cyber vulnerabilities should be identified during the course of evaluation vulnerability.

Force Protection Ashore Project 3155 addresses selective topics in modeling, and material technologies to reduce the vulnerability of installations; and reduce the acquisition and operating costs of protective technologies. The demonstrations and validations provide the independent, technical and operational test data for the development of competitive performance specifications to acquire the required capabilities. The ATFP project is coordinated with other DOD programs.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0603725N / Facilities Improvement			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	6.327	5.664	7.587	-	7.587
Current President's Budget	6.306	5.664	10.149	-	10.149
Total Adjustments	-0.021	0.000	2.562	-	2.562
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.021	0.000			
• Rate/Misc Adjustments	0.000	0.000	2.562	-	2.562
Change Summary Explanation					
FY 2024 overall increase of \$4.485 million is due to program adjustments for Naval Facilities System, Facilities Related Control Systems (FRCS) Cybersecurity and Force Protection Ashore.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603725N / Facilities Improvement				Project (Number/Name) 0995 / Naval Facilities System			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0995: Naval Facilities System	19.260	2.132	1.993	2.192	-	2.192	2.517	2.441	2.409	2.459	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In accordance with the National Defense Strategy (NDS) of 2018, A Design for Maintaining Maritime Superiority 2.0 and the NAVFAC Strategic Design 2.0 Guidance, this program provides the Navy with new engineering capabilities that are required to overcome specific performance limitations of Naval shore facilities while reducing the cost of sustaining the Naval shore infrastructure and increasing resiliency. The program focuses available RDT&E resources on satisfying facility requirements where the Navy is a major stakeholder or where there are no tested validated Commercial Off the Shelf (COTS) solutions available, and a timely solution will not emerge without a Navy sponsored demonstration and validation. The program completes the development and validation of facility technologies originating in Navy science and technology programs, plus a variety of other sources that includes the National Science Foundation (NSF) and the National Institute of Standards and Technology (NIST). This program introduces the idea of resilient facilities and infrastructure thru hardening, rapid assessment, and recovery. The validated technologies will be implemented in the Navy's Military Construction (MILCON) and Facilities Sustainment Restoration and Modernization Programs (FSRM). The Duncan Hunter National Defense Authorization Act of 2009 laid down very specific guidelines for the correction of corrosion deficiencies in DoD shore facilities which is estimated to be \$1.9B (DOD Annual Cost of Corrosion for the Department of Defense Facilities and Infrastructure July 2010).

Project 0995 addresses two Navy facilities requirements: 1) waterfront facilities repair, upgrade and service life extension; and, 2) validation testing/performance monitoring of critical facilities (such as dry docks, piers, runways, magazines, etc.), testing and evaluation of the performance of alternative materials, and surfacing concepts, and, methods and corrosion technologies to reduce the cost of Sustainment, Restoration and Modernization (SRM).

Waterfront facilities, repair, upgrade and service life extension:

Improved resilience of our installations (employing key technology focus areas defined in the NDS) will enable readiness and fleet lethality. An urgent requirement exists for early identification of strategies and solution recommendations for sea level rise at Naval Facilities, and especially nuclear capable waterfront facilities. Recent weather patterns have heightened anxiety levels on perceived huge risks to Navy waterfront facilities. The sub-project will provide analysis and solution recommendations for facilities affected by sea level rise. Approximately 75% of the Navy's waterfront facilities are over 45 years old, but they were designed for a service life of 25 years. The over aged reinforced concrete requires costly and repetitive repairs. Besides providing more pier side ship maintenance and thus reduce dry dock costs, these piers must be strengthened to support concentrated crane loads up to 140 tons when piers were originally not designed for concentrated loads. Piers were previously designed to service one, or possibly two, specific ship classes. Berthing flexibility is now limited by mooring and utility arrangements. This sub-project addresses new material design and retrofit methods, which extends the service life of existing waterfront facilities by an additional 15 years, or longer. The project also addresses updating the mission-based service, environmental, and protection loading requirements imposed by changes in platforms, operations and threats. Other initiatives include leveraging Building Information Modeling (BIM) technology to provide for enhanced facilities management processes and waterfront utilities service enhancements using models to achieve flexible berthing arrangements consistent with current and future platform mooring configurations and hotel service requirements including Facilities and Infrastructure Integrated Product Support for Acquisition Category (ACAT) Programs.

Technologies to reduce the cost of Sustainment, Restoration and Modernization (SRM):

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603725N / Facilities Improvement		Project (Number/Name) 0995 / Naval Facilities System		
Technologies to reduce the cost of SRM issues of high operational significance are addressed on a priority basis. The Navy's portion of corrosion deficiencies at DoD shore facilities is estimated to be \$433M (DOD Annual Cost of Corrosion for the Department of Defense Facilities and Infrastructure July 2010). This effort will demonstrate and validate the cost and reliability of advanced corrosion technologies in order to ensure their acceptance and implementation.						
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Waterfront Facilities, Repair, Upgrade and Service Life Extension		1.279	1.128	1.315	0.000	1.315
Articles:		-	-	-	-	-
FY 2023 Plans:						
-Continue funding technologies which includes the addition of investment in Climate Change Adaptation.						
-Decrease investment in autonomous inspection technologies for piers, pavements, and runways.						
FY 2024 Base Plans:						
-Continue to fund and develop technologies/capabilities that increase adaptation in response to Climate Change.						
-Continue funding developing technologies/capabilities that increase facilities resiliency and longevity.						
FY 2024 OCO Plans:						
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement:						
FY24 increase of \$0.187M supports Climate Change Adaptation initiatives.						
Title: Sustainment, Restoration & Modernization		0.853	0.865	0.877	0.000	0.877
Articles:		-	-	-	-	-
FY 2023 Plans:						
-Continue funding technologies which includes the addition of designing for Climate Change.						
FY 2024 Base Plans:						
-Continue funding technologies that enhance facility designs to accommodate Climate Change and decrease building cost.						
FY 2024 OCO Plans:						
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement:						
FY24 increase of \$0.012M supports Climate Change Adaptation initiatives.						
Accomplishments/Planned Programs Subtotals		2.132	1.993	2.192	0.000	2.192
C. Other Program Funding Summary (\$ in Millions)						
N/A						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603725N / <i>Facilities Improvement</i>	Project (Number/Name) 0995 / <i>Naval Facilities System</i>
C. Other Program Funding Summary (\$ in Millions)		
Remarks		
D. Acquisition Strategy		
<p>The Projects identified in this budget have been carefully selected to respond to: Facilities support for the National Defense Strategy of 2018, Acquisition Category Programs, to address TOC and resiliency considerations of an evolving and aging infrastructure, and to facilitate rational risk based decisions and solutions to protect and decrease risk levels for Department of the Navy-critical infrastructure and facilities. Each project has been assessed to ensure that it is addressing legitimate risks and requirements of the shore establishment. The results of these projects will be the development of design and construction criteria and or components that directly influence shore facilities.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603725N / Facilities Improvement				Project (Number/Name) 0995 / Naval Facilities System					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Waterfront Facilities, Repair, Upgrade and Services Life Extension	Various	NAVFAC EXWC : Pt Hueneme, CA	8.605	1.279	Dec 2021	1.128	Jan 2023	1.315	Jan 2024	-		1.315	Continuing	Continuing	Continuing
Sustainment, Restoration and Modernization	Various	NAVFAC EXWC : Pt Hueneme, CA	10.655	0.853	Dec 2021	0.865	Jan 2023	0.877	Jan 2024	-		0.877	Continuing	Continuing	Continuing
Subtotal			19.260	2.132		1.993		2.192		-		2.192	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			19.260	2.132		1.993		2.192		-		2.192	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603725N / Facilities Improvement

Project (Number/Name)

0995 / Naval Facilities System

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Waterfront Facilities, Repair, Upgrade and Service Life Extension																												
Continue Waterfront Facilities, Repair, Upgrade and Service Life Extension																												
Engineering Coatings for Fasteners																												
Carbon Fiber Reinforced Polymer Rebar for Concrete Waterfront Facilities																												
Autonomous Inspection Technology and Systems for Waterfront Facilities																												
Climate Change Effects																												
Fluid Induced Vibrational (FIV) Degradation and Augmented Reality (AR)																												
Sustainment, Restoration & Modernization																												
Continue Sustainment, Restoration & Modernization																												
Corrosion Prevention and Control																												
High Temperature Pavement Design Mix Optimization																												
Evaluate Solutions to Develop Design and Construction Criteria																												
Retrofitting Existing Facilities to Conform to High Performance Building Standards																												
Develop Design Criteria for Closed Piers and Wharves																												
Unmanned Systems for Facilities Inspection and Design Reconstruction																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603725N / <i>Facilities Improvement</i>	Project (Number/Name) 0995 / <i>Naval Facilities System</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Waterfront Facilities, Repair, Upgrade and Service Life Extension</i>				
Continue Waterfront Facilities, Repair, Upgrade and Service Life Extension	1	2022	4	2028
Engineering Coatings for Fasteners	1	2022	4	2028
Carbon Fiber Reinforced Polymer Rebar for Concrete Waterfront Facilities	1	2022	4	2028
Autonomous Inspection Technology and Systems for Waterfront Facilities	1	2022	4	2028
Climate Change Effects	1	2022	4	2028
Fluid Induced Vibrational (FIV) Degradation and Augmented Reality (AR)	1	2022	4	2028
<i>Sustainment, Restoration & Modernization</i>				
Continue Sustainment, Restoration & Modernization	1	2022	4	2028
Corrosion Prevention and Control	1	2022	4	2028
High Temperature Pavement Design Mix Optimization	1	2022	4	2028
Evaluate Solutions to Develop Design and Construction Criteria	1	2022	4	2028
Retrofitting Existing Facilities to Conform to High Performance Building Standards	1	2022	4	2028
Develop Design Criteria for Closed Piers and Wharves	1	2022	4	2028
Unmanned Systems for Facilities Inspection and Design Reconstruction	1	2022	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603725N / Facilities Improvement				Project (Number/Name) 3018 / Facilities Related Controls Systems (FRCS) Cybersecurity RDTE			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3018: Facilities Related Controls Systems (FRCS) Cybersecurity RDTE	1.250	3.237	2.829	6.462	-	6.462	3.820	3.617	3.545	3.619	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Cyber Vulnerability Assessments and Evaluations program funds cyber vulnerability assessments of critical shore infrastructure as directed by Section 1650 of the FY17 National Defense Authorization Act (NDAA). Funding will be used for assessments of prioritized critical shore infrastructure. Sec. 1650 of the FY17 NDAA directs the Secretary of Defense to submit a plan for assessing the cyber vulnerability of critical defense infrastructure and begin assessment of this infrastructure during a preliminary pilot program that will assess no fewer than two installations by December, 31 2019. Funded vulnerability assessments will end by calendar year 2020 and will build upon existing mission assurance, blue team, and red team capabilities. As instructed by the Congressional language, the assessments will utilize DoE and DoD national laboratory partnerships. Assessments will end with the submission of a final report to Congress. Strategies and procedures for mitigating the risk of cyber vulnerabilities should be identified during the course of evaluation vulnerability.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Cyber Protection and Response Capability (CPRC)	1.000	1.225	2.633	0.000	2.633
Articles:	-	-	-	-	-
FY 2023 Plans: -Continue to develop and test ICS/SCADA assessment procedures -Introduce additional Red Team and Blue team testing of Facilities Related Controls Systems (FRCS) Architecture and Control Systems Platform Enclave (CSPE) -Deploy SDN architecture in to RDTE environment -Test additional FRCS standardization models in RDTE environment -Test Cyber Protection and Response Capability (CPRC) capabilities within emerging cyber vulnerabilities and signatures					
FY 2024 Base Plans: -Develop and test additional FRCS models in RDTE environment -Deploy Red and Blue Team capability to RDTE environment -Test latest cyber vulnerabilities in RDTE environment					
FY 2024 OCO Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023				
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603725N / Facilities Improvement		Project (Number/Name) 3018 / Facilities Related Controls Systems (FRCS) Cybersecurity RDTE				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)				FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A								
FY 2023 to FY 2024 Increase/Decrease Statement: FY24 increase of \$1.408M is to support Critical Asset sensing.								
Title: More Situational Awareness (MOSAICS)				0.937	1.324	2.689	0.000	2.689
Articles:				-	-	-	-	-
FY 2023 Plans: -Continue adding sites to MOSAICs monitoring footprint within the RDTE architecture. -Introduce cyber vulnerability test scenarios to develop signatures -Integrate SDN and MOSAICS into standard operating architecture -Test SCEPTRE and CSTB functionality -Validate response capabilities within FLEX								
FY 2024 Base Plans: -Continue adding MOSAIC sites to overall transition plan. -Incorporate Fleet test results into MOSAIC's transition plan								
FY 2024 OCO Plans: N/A								
FY 2023 to FY 2024 Increase/Decrease Statement: FY24 increase of \$1.365M is to develop and test sensing capability in the MOSAICs RDTE environment.								
Title: Digital Twin Development				1.300	0.280	1.140	0.000	1.140
Articles:				-	-	-	-	-
FY 2023 Plans: -Continue development and management of Digital Twin capabilities.								
FY 2024 Base Plans: -Continue development and management of Digital Twin capabilities.								
FY 2024 OCO Plans: N/A								
FY 2023 to FY 2024 Increase/Decrease Statement:								

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603725N / Facilities Improvement		Project (Number/Name) 3018 / Facilities Related Controls Systems (FRCS) Cybersecurity RDTE		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
FY24 increase of \$0.860M is to support development and test capability in the digital twin.						
Accomplishments/Planned Programs Subtotals		3.237	2.829	6.462	0.000	6.462
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
Demonstration and validation is conducted for maximum transfer and interaction with industry such as to influence the industry COTS with the results of this demonstration and prototype validation. Acquisition is based on performance specifications enabled by this project.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603725N / Facilities Improvement				Project (Number/Name) 3018 / Facilities Related Controls Systems (FRCS) Cybersecurity RDTE					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Cyber Protection and Response Capability	WR	EXWC : Pt. Hueneme, CA	0.625	1.000	Feb 2022	1.225	Dec 2022	2.633	Oct 2023	-		2.633	Continuing	Continuing	Continuing
More Situational Awareness (MOSAICS)	C/CPFF	SANDIA National Labs : SANDIA National Labs	0.625	0.937	Feb 2022	1.324	Dec 2022	1.689	Oct 2023	-		1.689	Continuing	Continuing	Continuing
Digital Twin Development	C/CPFF	GSA : GSA	0.000	1.300	Feb 2022	0.280	Dec 2022	1.140	Dec 2023	-		1.140	Continuing	Continuing	Continuing
More Situational Awareness (MOSAICS)	WR	EXWC : NBVC	0.000	0.000		0.000		1.000	Oct 2023	-		1.000	0.000	1.000	-
Subtotal			1.250	3.237		2.829		6.462		-		6.462	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			1.250	3.237		2.829		6.462		-		6.462	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy										Date: March 2023			
Appropriation/Budget Activity					R-1 Program Element (Number/Name)					Project (Number/Name)			
1319 / 4					PE 0603725N / Facilities Improvement					3018 / Facilities Related Controls Systems (FRCS) Cybersecurity RDTE			

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Facilities Related Controls Systems (FRCS) Cybersecurity																												
Cyber Protection and Response Capability (CPRC)																												
Continue More Situational Awareness (MOSAICS) Industrial Control systems																												
Digital Twin Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603725N / Facilities Improvement	Project (Number/Name) 3018 / Facilities Related Controls Systems (FRCS) Cybersecurity RDTE

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Facilities Related Controls Systems (FRCS) Cybersecurity				
Cyber Protection and Response Capability (CPRC)	1	2022	4	2028
Continue More Situational Awareness (MOSAICS) Industrial Control systems	1	2022	4	2028
Digital Twin Development	1	2022	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603725N / Facilities Improvement				Project (Number/Name) 3155 / Force Protection Ashore			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3155: Force Protection Ashore	8.639	0.937	0.842	1.495	-	1.495	1.480	1.306	1.298	1.324	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Protection of Navy installations against terrorist activities requires deployment of advanced technology for force protection capabilities. This antiterrorism and force protection (AT/FP) ashore project will develop, demonstrate and validate technologies for the following: access control and integrated perimeter security surveillance sensors and intelligent electronic security systems for automated intruder detection (Installation Protection); perimeter security; waterside protection against craft and swimmer intrusion; secure and efficient operations centers and emergency management centers including human and information support systems (Command and Control). Programs currently being evaluated are, standard-based enterprise physical security system integration and automation; Command, Control, and Communications (C3) capabilities for emergency operations; integrated and networked mass notification systems (MNS); Waterside intelligent video security systems; integrated over-the-water sensors and analytics for automated course of action planning; identifying and interdicting malevolent threats - watercraft, swimmers, divers, and unmanned underwater vessels (UUVs) to reduce injury and death to the warfighter and damage to high value units (HVUs)(Waterside Protection). Through demonstration and validation of risk modeling and simulation models, the potential of emerging technologies will be evaluated and installation security strategies that reduce manpower and other costs will be formulated. Multiple systems with sensors and cameras are being deployed on Navy installations to be used for threat assessment. These systems are not integrated and there is not a centralized location or system that all the data can be analyzed. The Sensor Assessment Cell (SAC) brings all these sensor feeds into one location and the Physical Security Information Management (PSIM) software provides an integrated picture so that an intelligent assessment can be made. Current AT/FP systems to be integrated include Automated Vehicle Gates (AVG), Regional Alarms/Local Alarms (AMAS), Navy Munition Command enclave (NMC), and Electronic Harbor Security System. These demonstrations and validations derive advanced technology from science and technology programs of government academia and industry. The technology evaluation and validation produces data for performance specifications used for competitive procurement. All work will be coordinated with other programs and through industry forums as appropriate.

Facilities Related Controls Systems (FRCS) Cybersecurity RDTEN

The Cyber Vulnerability Assessments and Evaluations program funds cyber vulnerability assessments of critical shore infrastructure as directed by Section 1650 of the FY17 National Defense Authorization Act (NDAA). Funding will be used for assessments of prioritized critical shore infrastructure and to assess the cyber vulnerability of critical defense infrastructure. Funded vulnerability assessments will build upon existing mission assurance, blue team, and red team capabilities. As instructed by the Congressional language, the assessments will utilize DoE and DoD national laboratory partnerships.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Force Protection Ashore	0.937	0.842	1.495	0.000	1.495
Articles:	-	-	-	-	-
FY 2023 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603725N / Facilities Improvement		Project (Number/Name) 3155 / Force Protection Ashore		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Initiate Facial Recognition Access Control Technology Extension (FRACT-X). Incorporates commercial-off-the shelf facial recognition capability to directly support the acceleration of deter, detect, assess, and respond for unauthorized access of vehicles and pedestrians within protection zones managed by physical access control systems (PACS) for achieving another tier of multifactor authentication for point of ingress decision making. Leveraging an AI-powered, best in class facial recognition and verification, authentication hardware and software capability, provide near real-time and highly confident 1 to1 or 1 to N authentication of the individual attempting to gain access.</p> <p>- Initiate Geofencing. Incorporates commercial-off-the shelf solution linking Navy Installations to Federal mass alert system in order to allow for calls/emergency notification to be sent direct to the Regional Dispatch Center (RDC) based on caller's geographical location inside the installation perimeter. All callers will be able to call 911 and based on their geographical location will be properly routed to the RDC or will be routed out in town for their emergency need.</p> <p>- Initiate Mobile Network Support to Physical Security Systems. Incorporates commercial-off-the shelf solution that will allow physical security systems to be interlinked and inform a common operational picture installation wide allowing the installation watch officer to be completely informed 24/7.</p> <p>FY 2024 Base Plans:</p> <p>- Continue Underwater Unmanned Vehicle Detection, Tracking and Classification (UUV-DTC).</p> <p>- Initiate Geofencing. Incorporates commercial-off-the shelf solution linking Navy Installations to Federal mass alert system in order to allow for calls/emergency notification to be sent direct to the Regional Dispatch Center (RDC) based on caller's geographical location inside the installation perimeter. All callers will be able to call 911 and based on their geographical location will be properly routed to the RDC or will be routed out in town for their emergency need.</p> <p>- Initiate Mobile Network Support to Physical Security Systems. Incorporates commercial-off-the shelf solution that will allow physical security systems to be interlinked and inform a common operational picture installation wide allowing the installation watch officer to be completely informed 24/7</p> <p>FY 2024 OCO Plans:</p> <p>N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603725N / Facilities Improvement		Project (Number/Name) 3155 / Force Protection Ashore		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
FY24 increase of \$0.653M supports testing and evaluation of Geofencing and Mobile Network Solutions.						
Accomplishments/Planned Programs Subtotals		0.937	0.842	1.495	0.000	1.495
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
Demonstration and validation is conducted for maximum transfer and interaction with industry such as to influence the industry COTS with the results of this demonstration and prototype validation. Acquisition is based on performance specifications enabled by this project.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603725N / Facilities Improvement					Project (Number/Name) 3155 / Force Protection Ashore				
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Command and Control Capability Development: Government Engineering Support	Various	SPAWAR : San Diego, CA	0.499	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Installation Protection: Airborne Threat	WR	NAWCAD/ONR : Pax River, MD	1.687	0.000		0.000		0.000		-		0.000	0.000	1.687	-
Access Control Point (ACP)	Various	SPAWAR : San Diego, CA	0.250	0.000		0.000		0.000		-		0.000	0.000	0.250	-
Waterside Intelligent Video Security System (WSIVDS)	Various	SPAWAR : San Diego, CA	0.754	0.000		0.000		0.000		-		0.000	0.000	0.754	-
Command and Control Capability Development: Virtual Field Support	WR	SPAWAR : San Diego, CA	0.897	0.000		0.000		0.000		-		0.000	0.000	0.897	-
Integrated Multi-sensor Perimeter Awareness with Intelligent LiDAR (IMPAIL) System	Various	NIWC-PAC : San Diego, CA	0.250	0.000		0.000		0.000		-		0.000	0.000	0.250	-
Waterside Protection: Boat Barriers	C/CPFF	CTTSO : CTTSO	0.999	0.000		0.000		0.000		-		0.000	0.000	0.999	-
Multimodal Automated Vehicle Barrier (MAVB)	Various	NIWC-PAC : San Diego, CA	0.405	0.000		0.000		0.000		-		0.000	0.000	0.405	-
Sensor Assessment Cell (SAC) Capability Development	Various	SPAWAR : San Diego, CA	0.304	0.000		0.000		0.000		-		0.000	0.000	0.304	-
Modeling and Simulation of Requirements (M/S ? REQ)	Various	NIWC-LANT : Charleston,SC	0.149	0.000		0.000		0.000		-		0.000	0.000	0.149	-
Installation Protection Capability Development - Integrated Physical Security and Access Control Automation: Spiral Development	Various	NSWC : Dahlgren, VA	0.597	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603725N / Facilities Improvement				Project (Number/Name) 3155 / Force Protection Ashore					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Installation Protection Capability Development -Integrated Physical Security and Access Control Automation:Test & Evaluation (DT)	Various	NSWC : Dahlgren, VA	0.449	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Installation Protection Capability Development - Integrated Physical Security and Access Control Automation:Test & Evaluation (OT)	Various	SPAWAR : San Diego, CA	0.332	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Water Protection - Common Information Exchange Spiral Development	WR	SSC-PAC : SSC-PAC	0.244	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Installation Protection - Versatile Access Control Spiral Development	WR	NSWC : Dahlgren, VA	0.339	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Waterside Protection - Boat Barrier Electronic Infrastructure - Spiral Development	WR	SSC-PAC : SSC-PAC	0.484	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Waterside Intelligent Video Security System (WDSS)	Various	SPAWAR : SAN DIEGO, CA	0.000	0.532	Dec 2021	0.000		0.000		-		0.000	0.000	0.532	-
Perimeter Defense Sensor Systems (PDSS)	Various	EXWC : Pt. Hueneme, CA	0.000	0.405	Dec 2021	0.000		0.000		-		0.000	0.000	0.405	-
Rapid Intelligent Video Analytics Layer (RIVAL)	Various	SSC-PAC : SSC-PAC	0.000	0.000		0.342	Dec 2022	0.000		-		0.000	0.000	0.342	-
Facial Recognition Access Control Technology Extension (FRACT-X)	Various	SSC-PAC : SSC-PAC	0.000	0.000		0.250	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Underwater Unmanned Vehicle Detection, Tracking and Classification (UUV-DTC)	Various	SSC-PAC : SSC-PAC	0.000	0.000		0.250	Dec 2022	0.674	Dec 2023	-		0.674	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603725N / Facilities Improvement						Project (Number/Name) 3155 / Force Protection Ashore			
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Installation Protection - Geofencing	Various	NSWC : Crance, IN	0.000	0.000		0.000		0.471	Dec 2023	-		0.471	Continuing	Continuing	Continuing
Installation Protection - Mobile Network Support	Various	NSWC : Panama City, FL	0.000	0.000		0.000		0.350	Dec 2023	-		0.350	Continuing	Continuing	Continuing
Subtotal			8.639	0.937		0.842		1.495		-		1.495	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			8.639	0.937		0.842		1.495		-		1.495	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0603725N / Facilities Improvement

Project (Number/Name)
3155 / Force Protection Ashore

Installation Protection Capability Development	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
	Installation Protection Capability Development																											
(Access Control Point) ACP Video Analytics	Subproj: Integrated Physical Security and Access Control Automation: Spiral Development																											
	Installation Protection - Airborne Threat: Test & Evaluation (DT)																											

2024DON - 0603725N - 3155

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603725N / Facilities Improvement

Project (Number/Name)

3155 / Force Protection Ashore

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PE 0603725N: *Facilities Improvement*
Navy

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R-1 Program Element (Number/Name)	Program Element Description	Program Element Type	Program Element Status	Program Element Location	Program Element Contact	Program Element Date	Program Element Notes

PE 0603725N / Facilities Improvement

3155 / Force Protection Ashore

1319 / 4

[illegible]

2024DON - 0603725N - 3155

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PE 0603725N: *Facilities Improvement*
Navy

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Project (Number/Name)
3155 / *Force Protection Ashore*

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603725N / Facilities Improvement

Project (Number/Name)

3155 / Force Protection Ashore

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Installation Protection Capability Development</i>				
Installation Protection Capability Development	1	2022	4	2026
Subproj: Integrated Physical Security and Access Control Automation: Spiral Development	2	2022	4	2026
Subproj: Installation Protection - Airborne Threat: Test & Evaluation (DT)	2	2022	4	2026
Installation Protection - Access Control: Test & Evaluation (DT)	2	2022	4	2026
Subproj: (Access Control Point) ACP Video Analytics	1	2022	1	2022
Subproj: Rapid Intelligent Video Analytics Layer (RIVAL)	1	2022	4	2022
Subproj: Facial Recognition Access Control Technology Extension (FRACT-X)	1	2022	4	2024
Subproj: Geofencing	1	2023	4	2026
Subproj: Mobile Network Support	1	2023	4	2026
<i>Command and Control Capability Development</i>				
Command and Control Capability Development	1	2022	4	2022
Subproj: Command and Control Capability Development - Virtual Field Support: Test & Evaluation (DT)	2	2022	4	2022
<i>Waterside Protection Capability Development</i>				
Waterside Protection Capability Development	1	2022	4	2022
Subproj: Automated Sensor Assessment and Course of Action Planning: Spiral Development	1	2022	4	2022
Subproj: Waterside Protection: Common Information Exchange - Sprial Development	1	2022	2	2022
Waterside Protection Boat Barriers - Test and Evaluation (OT)	2	2022	4	2022
Subproj: Waterside Intelligent Video Security System	1	2022	2	2022
Subproj: Waterside Defensive Sensor Systems (WDSS)	1	2022	3	2022

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603725N / Facilities Improvement		Project (Number/Name) 3155 / Force Protection Ashore	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
Subproj: Underwater Unmanned Vehicle Detection, Tracking and Classification (UUV-DTC)		1	2022	4	2026
Sensor Assessment Cell (SAC) Capability Development					
Subproj: Physical Security Information Manager (PSIM)		1	2022	4	2022
Subproj: PSIM Sensor Integration		1	2022	4	2022
Subproj: Regional Dispatch/SAC systems Integration		1	2022	4	2022
Subproj: Perimeter Defense Senor Systems (PDSS)		1	2022	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	PE 0603734N / CHALK CORAL											
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	558.549	753.303	687.841	-	687.841	845.892	809.892	552.077	562.018	Continuing	Continuing
1804: <i>Chalk Coral</i>	0.000	558.549	753.303	687.841	-	687.841	845.892	809.892	552.077	562.018	Continuing	Continuing

A. Mission Description and Budget Item Justification

The details of this budget justification are classified, per Executive Order 13526, Sec 1.4 (a) and are submitted annually to Congress in the classified budget justification book.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	579.389	833.634	795.869	-	795.869
Current President's Budget	558.549	753.303	687.841	-	687.841
Total Adjustments	-20.840	-80.331	-108.028	-	-108.028
• Congressional General Reductions	-	-0.331			
• Congressional Directed Reductions	-	-80.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-20.840	0.000			
• Program Adjustments	0.000	0.000	0.184	-	0.184
• Rate/Misc Adjustments	0.000	0.000	-108.212	-	-108.212

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603739N / Navy Logistic Productivity							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	4.245	0.643	0.899	4.712	-	4.712	6.059	1.036	0.973	0.993	Continuing	Continuing
0356: NADACS inventory	0.000	0.000	0.000	4.000	-	4.000	5.000	0.000	0.000	0.000	0.000	9.000
3223: Logistics R&D	4.245	0.643	0.899	0.712	-	0.712	1.059	1.036	0.973	0.993	Continuing	Continuing

A. Mission Description and Budget Item Justification

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

Includes development and evaluation of incentive systems for improving the productivity of civilian and military personnel. Identifies barriers to increased productivity and evaluates the effect of removing them. Develops techniques for easing the introduction of new technology to the work place. Identifies and evaluates methods for improving the quality of work-life.

Excludes civilian and military manpower and their related costs and military construction costs which are included in appropriate Management and Support elements in this program.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	0.669	0.899	1.426	-	1.426
Current President's Budget	0.643	0.899	4.712	-	4.712
Total Adjustments	-0.026	0.000	3.286	-	3.286
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.026	0.000			
• Program Adjustments	0.000	0.000	3.285	-	3.285
• Rate/Misc Adjustments	0.000	0.000	0.001	-	0.001

Change Summary Explanation

FY 2024 net increase of \$3.286 million provided in Project 0356 supports rapid fielding of Naval Autonomous Data Collection System (NADACS).

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603739N / Navy Logistic Productivity				Project (Number/Name) 0356 / NADACS inventory			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0356: NADACS inventory	0.000	0.000	0.000	4.000	-	4.000	5.000	0.000	0.000	0.000	0.000	9.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Stable annual funding is required to facilitate implementation and execution of a robust, flexible Logistics R&D program that will provide the means for Naval Supply Systems Command (NAVSUP) to effectively pursue solutions to mission-related capability and technology gaps. The NAVSUP Logistics R&D program has an established infrastructure and business process for ensuring that R&D funds are applied to projects that address high priority enterprise needs established in accordance with OPNAV goals and the NAVSUP Commander's Guidance.

From a process perspective, Logistics R&D investments are governed by a NAVSUP enterprise-wide Executive Steering Group (ESG) chaired by the NAVSUP Vice Commander, and comprised of SES and Command leadership representatives. The ESG ratifies capability and technology gaps identified by all activities within the enterprise, and then assesses and prioritizes all proposed Logistics R&D initiatives in accordance with their potential for filling the established gap and generating return on investment.

The established Logistics R&D business management process has currently identified capability/technology gaps in the following general areas: 1) the need to develop formalized food service management techniques that focus on increased efficiency of new and existing systems and facilities. 2) the need to modernize quality of life (QOL) services to improve overall services, offer additional desired features and reduce total ownership costs, 3) the need to assess clothing protection for the warfighter in areas of thermal/flame threats, protective footwear, and physical (hearing, vibration, etc.) clothing/accessories, 4) the need to develop logistics data access and information sharing through enhanced Graphical User Interfaces (GUI) and web-based data services, 5) the need to develop a capability that allows Integrated Logistics Support (ILS) repair and modernization tools, 6) the need to leverage breakthrough technologies to improve supply chain processing. This modest R&D investment will establish a NAVSUP Logistics R&D Program to explore additional technologies and significantly increase potential cost savings.

The Naval Autonomous Data Collection System (NADACS) is an Enterprise level, multi-source, digital tracking tool that supports asset visibility, accountability & auditability. The system directly supports both Congressional and Departmental dictates that require Navy to improve its ability to maintain and track material, assets and equipment with a high degree of accuracy and accountability.

NADACS uses a variety of handheld readers, fixed readers, Mesh networking, and sensors to collect asset and combine data from barcoding, Radio Frequency identification (RFID) and Internet of Things (IOT) sensors to provide locational and health information of assets which can then be compared with on-hand inventory records.

NAVSUP will be employing cellular 5G capabilities with Satellite Communication (SATCOM) along with other communication transport methods to move data from point of collection to the NADACS database, and then providing end users with a 'Web Browser' picture to assess and manage the asset picture. NADACS is based on government owned software coupled with specialty and commercially available hardware to create a complete system. For commercial hardware, the system is hardware agnostic, encouraging use of available hardware while maintaining a high degree of competition.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603739N / Navy Logistic Productivity		Project (Number/Name) 0356 / NADACS inventory		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div><div>Title: Storage Location RFID Tech Expansion</div><div>Articles:</div><div>Description: Warehouse and indoor/outdoor storage location RFID Technology expansion.</div><div>FY 2023 Plans: This funding was provided beginning in FY24.</div><div>FY 2024 Base Plans: \$0.760M to investigate robust RFID tagging material/options for tagging warehouse items as well as ground support equipment, MHE and other mobile equipment used at FLCs, Shipyards and Air Stations. Tags will include current paper to expand to rigid, encased, tamper-resistant and all-weather.</div><div>FY 2024 OCO Plans: N/A</div><div>FY 2023 to FY 2024 Increase/Decrease Statement: FY24 funding increased \$0.760 million for warehouse and indoor/outdoor storage location RFID Technology expansion as part of Rapid Fielding of NADACS.</div></div>		0.000 -	0.000 -	0.760 -	0.000 -	0.760 -
<div><div>Title: Alternative Data Gateway for Logistics Data</div><div>Articles:</div><div>Description: Alternative data gateway for logistics data.</div><div>FY 2023 Plans: This funding was first provided for FY24.</div><div>FY 2024 Base Plans: \$0.900M to explore multiple fixed and mobile gateways for data collection. Leverage emerging 5G cellular technology, Iridium SBD modems and high speed WiFi.</div><div>FY 2024 OCO Plans: N/A</div><div>FY 2023 to FY 2024 Increase/Decrease Statement: FY24 funding increased \$0.900 million for an alternative data gateway for logistics data as part of Rapid Fielding of NADACS.</div></div>		0.000 -	0.000 -	0.900 -	0.000 -	0.900 -
Title: Asset Tracking in a Box,		0.000	0.000	2.100	0.000	2.100

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603739N / Navy Logistic Productivity		Project (Number/Name) 0356 / NADACS inventory		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Articles:		-	-	-	-	-
Description: Asset tracking in a box, addition of "Fetch Robot"						
FY 2023 Plans: Funds first provided for FY24.						
FY 2024 Base Plans: \$2.100M to develop multiple types of devices: Sensors (RFID, mess tags, etc.), Collectors (readers, mesh network, Bluetooth, etc.), Communication Gateways (mesh, WiFi, Bluetooth, 5G hotspot, etc.) to connect to NADACS. Explore using "Fetch Robot" as an automated vehicle sensors for RFID tag data collection.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: FY24 funding increased \$2.100 million for Asset Tracking in a Box and the addition of "Fetch Robot" as part of Rapid Fielding of NADACS.						
Title: Integrate FACET with NADACS GUI		0.000	0.000	0.240	0.000	0.240
Articles:		-	-	-	-	-
Description: Integrate FACET with NADACS GUI						
FY 2023 Plans: Funding first provided for FY24.						
FY 2024 Base Plans: \$0.240M to develop software integration with FACET and NADACS. This will enable users to have a centralized location for multiple warehousing processes.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: FY24 funding increased \$0.240 million for integration of FACET with the NADACS GUI as part of Rapid Fielding of NADACS.						
Accomplishments/Planned Programs Subtotals		0.000	0.000	4.000	0.000	4.000

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603739N / Navy Logistic Productivity	Project (Number/Name) 0356 / NADACS inventory
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy NAVSUP R&D executed through firm fixed price negotiated contracts and NAVSUP support. Performance-based reviews conducted quarterly by the Project Management Office.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603739N / Navy Logistic Productivity				Project (Number/Name) 0356 / NADACS inventory					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Storage location RFID Tech Expansion	C/BA	Navy AIT (SUP06) : Norfolk, VA	0.000	0.000		0.000		0.760	Jun 2024	-		0.760	0.000	0.760	-
Alternative Data Gateway for Logistics Data	C/BA	Navy AIT (SUP06) : Norfolk, VA	0.000	0.000		0.000		0.900	Jun 2024	-		0.900	0.000	0.900	-
Asset Tracking in a Box,	C/BA	Navy AIT (SUP06) : Norfolk, VA	0.000	0.000		0.000		2.100	Jun 2024	-		2.100	0.000	2.100	-
Integrate FACET with NADACS GUI	C/BA	Navy AIT (SUP06) : Norfolk, VA	0.000	0.000		0.000		0.240	Jun 2024	-		0.240	0.000	0.240	-
Subtotal			0.000	0.000		0.000		4.000		-		4.000	0.000	4.000	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		0.000		4.000		-		4.000	0.000	4.000	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0603739N / Navy Logistic Productivity

Project (Number/Name)
0356 / NADACS inventory

Rapid Fielding of Naval Autonomous Data Collection System	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Warehouse and Storage Location RFID Tech Expansion																												
Contract Award										▲				▲														
Development/Functional Testing																												
Implementation												▲																
Alternative Data Gateway for Logistics Data																												
Contract Award										▲				▲														
Development/Functional Testing																												
Implementation												▲								▲								
Asset Tracking in a Box "Fetch Robot"																												
Contract Award										▲				▲														
Development/Functional Testing																												
Implementation												▲								▲								
Integrate FACET with NADACS GUI																												
Contract Award										▲				▲														
Development/Functional Testing																												
Implementation												▲																

2024PB - 0603739N - 0356

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603739N / Navy Logistic Productivity	Project (Number/Name) 0356 / NADACS inventory	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Rapid Fielding of Naval Autonomous Data Collection System</i>				
Warehouse and Storage Location RFID Tech Expansion: Contract Award: FY2024 Contract Award	2	2024	2	2024
Warehouse and Storage Location RFID Tech Expansion: Contract Award: FY2025 Contract Award	2	2025	2	2025
Warehouse and Storage Location RFID Tech Expansion: Development/Functional Testing: FY2024 Development/Functional Testing	3	2024	3	2024
Warehouse and Storage Location RFID Tech Expansion: Development/Functional Testing: FY2025 Development/Functional Testing	3	2025	3	2025
Warehouse and Storage Location RFID Tech Expansion: Implementation: FY2024 Implementation	4	2024	4	2024
Warehouse and Storage Location RFID Tech Expansion: Implementation: FY2025 Implementation	4	2024	4	2024
Alternative Data Gateway for Logistics Data: Contract Award: FY2024 Contract Award	2	2024	2	2024
Alternative Data Gateway for Logistics Data: Contract Award: FY2025 Contract Award	2	2025	2	2025
Alternative Data Gateway for Logistics Data: Development/Functional Testing: FY2024 Development/Functional Testing	3	2024	3	2024
Alternative Data Gateway for Logistics Data: Development/Functional Testing: FY2025 Development/Functional Testing	3	2025	3	2025
Alternative Data Gateway for Logistics Data: Implementation: FY2024 Implementation	4	2024	4	2024
Alternative Data Gateway for Logistics Data: Implementation: FY2025 Implementation	4	2025	4	2025
Asset Tracking in a Box "Fetch Robot": Contract Award: FY2024 Contract Award	2	2024	2	2024
Asset Tracking in a Box "Fetch Robot": Contract Award: FY2025 Contract Award	2	2025	2	2025
Asset Tracking in a Box "Fetch Robot": Development/Functional Testing: FY2024 Development/Functional Testing	3	2024	3	2024

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603739N / Navy Logistic Productivity		Project (Number/Name) 0356 / NADACS inventory
		Start		End
Events by Sub Project		Quarter	Year	Quarter Year
Asset Tracking in a Box "Fetch Robot": Development/Functional Testing: FY2025 Development/Functional Testing		3	2025	3 2025
Asset Tracking in a Box "Fetch Robot": Implementation: FY2024 Implementation		4	2024	4 2024
Asset Tracking in a Box "Fetch Robot": Implementation: FY2025 Implementation		4	2025	4 2025
Integrate FACET with NADACS GUI: Contract Award: FY2024 Contract Award		2	2024	2 2024
Integrate FACET with NADACS GUI: Contract Award: FY2025 Contract Award		2	2025	2 2025
Integrate FACET with NADACS GUI: Development/Functional Testing: FY2024 Development/Functional Testing		3	2024	3 2024
Integrate FACET with NADACS GUI: Development/Functional Testing: FY2025 Development/Functional Testing		3	2025	3 2025
Integrate FACET with NADACS GUI: Implementation: FY2024 Implementation		4	2024	4 2024
Integrate FACET with NADACS GUI: Implementation: FY2025 Implementation		4	2024	4 2024

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603739N / Navy Logistic Productivity				Project (Number/Name) 3223 / Logistics R&D			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3223: Logistics R&D	4.245	0.643	0.899	0.712	-	0.712	1.059	1.036	0.973	0.993	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Stable annual funding is required to facilitate implementation and execution of a robust, flexible Logistics R&D program that will provide the means for Naval Supply Systems Command (NAVSUP) to effectively pursue solutions to mission-related capability and technology gaps. The NAVSUP Logistics R&D program has an established infrastructure and business process for ensuring that R&D funds are applied to projects that address high priority enterprise needs established in accordance with OPNAV goals and the NAVSUP Commander's Guidance.

From a process perspective, Logistics R&D investments are governed by a NAVSUP enterprise-wide Executive Steering Group (ESG) chaired by the NAVSUP Vice Commander, and comprised of SES and Command leadership representatives. The ESG ratifies capability and technology gaps identified by all activities within the enterprise, and then assesses and prioritizes all proposed Logistics R&D initiatives in accordance with their potential for filling the established gap and generating return on investment.

The established Logistics R&D business management process has currently identified capability/technology gaps in the following general areas: 1) the need to develop formalized food service management techniques that focus on increased efficiency of new and existing systems and facilities. 2) the need to modernize quality of life (QOL) services to improve overall services, offer additional desired features and reduce total ownership costs, 3) the need to assess clothing protection for the warfighter in areas of thermal/flame threats, protective footwear, and physical (hearing, vibration, etc.) clothing/accessories, 4) the need to develop logistics data access and information sharing through enhanced Graphical User Interfaces (GUI) and web-based data services, 5) the need to develop a capability that allows Integrated Logistics Support (ILS) repair and modernization tools, 6) the need to leverage breakthrough technologies to improve supply chain processing. This modest R&D investment will establish a NAVSUP Logistics R&D Program to explore additional technologies and significantly increase potential cost savings.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Digital Logistics	0.000	0.246	0.195	0.000	0.195
Articles:	-	-	-	-	-
Description: Digital Logistics					
FY 2023 Plans:					
Asset tracking in a box (\$100k)					
Multiple types of devices:					
Sensors (RFID, mess tags, etc.)					
Collectors (readers, mesh network, Bluetooth)					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603739N / Navy Logistic Productivity		Project (Number/Name) 3223 / Logistics R&D		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Communications gateways (mesh, wifi, Bluetooth, 5G hotspot, etc.) to connect to NADACS						
Alternative data gateway for logistics data (\$66k) NADACS currently has fixed and mobile gateways that support data collection. This effort would modify the mobile gateway from GSM standard to 3GPP Ver 16, 5G US standard.						
Warehouse/Storage location RFID technology expansion (\$80k) Current RFID tagging is currently limited to paper or foam back tags. This effort would investigate the use of alternative RFID tagging for detailed asset tracking in warehouse/storage locations. Effort would include tag, tag printers, as well as S/W/data process development. Type of tags would include rigid, encased and tamper resistant.						
FY 2024 Base Plans: Asset tracking in a box (\$79k) Multiple types of devices: Sensors (RFID, mess tags, etc.) Collectors (readers, mesh network, Bluetooth) Communications gateways (mesh, wifi, Bluetooth, 5G hotspot, etc.) to connect to NADACS						
Alternative data gateway for logistics data (\$52k) NADACS currently has fixed and mobile gateways that support data collection. This effort would modify the mobile gateway from GSM standard to 3GPP Ver 16, 5G US standard.						
Warehouse/Storage location RFID technology expansion (\$64k) Current RFID tagging is currently limited to paper or foam back tags. This effort would investigate the use of alternative RFID tagging for detailed asset tracking in warehouse/storage locations. Effort would include tag, tag printers, as well as S/W/data process development. Type of tags would include rigid, encased and tamper resistant.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603739N / Navy Logistic Productivity		Project (Number/Name) 3223 / Logistics R&D		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
FY 2023 to FY 2024 decrease due to reduced level of effort for asset tracking in a box, alternative data gateway for logistics data, and warehouse/storage location RFID technology expansion.						
<div>Title: Readiness Through Logistics Solutions</div> <div>Articles: -</div> <div>Description: DESCRIPTION: Supply chain improvements are required to support logistics efficiency and Fleet readiness through logistics solutions technological improvements. Develop technological capabilities that improve Naval Logistics in part or in its record (from manufacture, storage, delivery, use, maintenance, and disposal).</div> <div>FY 2023 Plans: N/A</div> <div>FY 2024 Base Plans: N/A</div> <div>FY 2024 OCO Plans: N/A</div>		0.131 -	0.000 -	0.000 -	0.000 -	0.000 -
<div>Title: Supply Chain Optimization</div> <div>Articles: -</div> <div>Description: Enable innovation in our supply chain processes in the areas of data sciences, logistics IT application development, and quality engineering through incorporation of Science, Technology, Engineering, and Math (STEM) projects performed by interns and academia.</div> <div>Peform market research on emerging supply chain technologies and methods that could be adopted to support the DoN/DoD material supply chain.</div> <div>Developed a new functionality (software supporting data structure and migration of current data) within Ordinance Information System (OIS) that provides visibility of serialized assets use and requirements.</div> <div>FY 2023 Plans: Reverse Engineering (\$114k) NLP funding will support research and development related to reverse engineering Navy Supply platforms which have been identified as either unsupported (no known or available source) or current support is posing a risk to</div>		0.131 -	0.114 -	0.090 -	0.000 -	0.090 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603739N / Navy Logistic Productivity		Project (Number/Name) 3223 / Logistics R&D		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
fleet readiness. Funding will be used for a small business to reverse engineer/reverse manufacture an item and develop a technical data package for future fleet requirements. FY 2024 Base Plans: Reverse Engineering (\$90k) NLP funding will support research and development related to reverse engineering Navy Supply platforms which have been identified as either unsupported (no known or available source) or current support is posing a risk to fleet readiness. Funding will be used for a small business to reverse engineer/reverse manufacture an item and develop a technical data package for future fleet requirements. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: FY 2023 to FY 2024 decrease due to level of effort for reverse engineering efforts.						
Title: Clothing Protection for the Warfighter <div>Articles:</div> Description: Identify challenges to effectively manage durability and safety aspects of common work/combat uniforms for the warfighter. Eliminate risk of hazardous factors such as fire, weather, and general wear/tear to maximize readiness and strength in Fleet uniforms. Assist with specifications associated with permanent press finish related to the rollout of the Navy's Type III uniform. FY 2023 Plans: Alternatives to PFAS for Water and Stain Repellent Treatments for Navy Textiles (\$85k) The NDAA for FY20 added PFAS to the toxic chemical list and the NDAA for FY22 directed a study of DoD procurement of PFAS containing items, to include shoes and clothing. There is pending federal legislation to further restrict usage of PFAS. The objective of the R&D effort is to investigate suitable PFAS alternatives for durable water repellent (DWR) and stain repellent treatments used in Navy clothing and equipment items. The NCTRF will assess PFAS-free fabric treatments by evaluating the repellency efficacy and degradative effects on material performance or comfort. The improved shipboard cold weather jacket is a developmental item that can be used to assess PFAS-free DWR treatment efficacy. Additionally, NCTRF will evaluate the performance of non-PFAS repellent treated chem-bio protective garment materials developed by Army DEVCOM Soldier Center. PFAS is used as abbreviation for perfluoroalkyl substances and polyfluoroalkyl substances. Product Lifecycle Management System (\$179k)		0.381 -	0.539 -	0.427 -	0.000 -	0.427 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603739N / Navy Logistic Productivity		Project (Number/Name) 3223 / Logistics R&D		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Currently, USN uniform and material data is spread among different databases and folders creating hours of research for NCTRF employee. USMC has successfully executed a beta test of PLM system, the Navy (alongside Army and Air Force) has an opportunity to cost share and create an organized and intuitive system for tracking and comparison as well as configuration management of pattern, testing , and design to facilitate uniform development. With an overall cost savings in the millions of dollars in the long term sustainment efforts as it aligns with uniform development						
Shipboard Cold Weather Clothing (CWC) System Development Follow-On (\$100k) To address the Navy's lack of shipboard CWC system, the FY21-FY22 development effort will deliver a recommendation for the shipboard CWC system components, prototypes for system components, findings from system assessment in a laboratory environment, and a draft Operational Requirements Document (ORD). Follow-on funding is required to execute a fit evaluation for the CWC system and a wear evaluation. Using the fit evaluation data, NCTRF will finalize garment technical data and designs for a wear evaluation. A user evaluation in a relevant operational environment is needed to validate the improved shipboard cold weather jacket and the shipboard CWC system performance.						
Validating the reduction of size blur with new proposed sizing system (\$85k) The need for size standardization within the Navy and across services has led to multi-year programs focusing on developing new sizing systems and conducting fit tests. Approximately four years ago the Navy teamed up with an industry partner and is now in its final phase. The industry partner, along with NCTRF, will conduct a fit test to evaluate and rate the efficacy of their recommended female sizes, shapes and statures of key style uniforms. In order for the Navy to move forward with the new sizing system with confidence that we are optimizing the tariff and limiting the possibility of size blur additional analysis is needed. This R&D effort will utilize the of the raw data collected during the fit test and conduct our own statistical analysis to validate the results provided by industry and further develop optimized tariffs that will ensure maximum differentiation of unique sizes with minimum SKUs.						
Lifecycle of a Uniform (\$45k) The lifecycle of a uniform is a frequently fielded question by NCTRF. This relates to sailor allowance as well as the overall ROI in updates or improvements of uniforms. This effort would be looking at further understanding the use of sustainable approaches with uniforms for the future but inorder to do that an establish baseline on the actual service and wear of a uniform will be a necessary data point as to understand. NCTRF can simulate durability but the actual timeline of a uniform service life has yet to be captured and understood. This effort will						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603739N / Navy Logistic Productivity		Project (Number/Name) 3223 / Logistics R&D		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
research all the sister areas approach to service life as well and also account for an actual or estimated service life of a navy uniform.						
3D Materials Library (\$45k) Through two consecutive R&D efforts, we have been successful in acquiring a COTS 3D software that is utilized to virtually sew together patterns to create true-to-life virtual prototypes. Through our research we have found that the key factor in ensuring that the virtual prototypes are exactly comparable to physical prototypes, is the detailed fabric characteristics are necessary. The next step in implementing 3D fully to streamline the development process is to have a full 3D material library. As technology advances, having accurate 3D prototyping services is becoming more in demand than ever. Having a cross-service 3D material library will further benefit our internal and external customers by providing a more affordable and sustainable development process.						
FY 2024 Base Plans: Alternatives to PFAS for Water and Stain Repellent Treatments for Navy Textiles (\$67k) The NDAA for FY20 added PFAS to the toxic chemical list and the NDAA for FY22 directed a study of DoD procurement of PFAS containing items, to include shoes and clothing. There is pending federal legislation to further restrict usage of PFAS. The objective of the R&D effort is to investigate suitable PFAS alternatives for durable water repellent (DWR) and stain repellent treatments used in Navy clothing and equipment items. The NCTRF will assess PFAS-free fabric treatments by evaluating the repellency efficacy and degradative effects on material performance or comfort. The improved shipboard cold weather jacket is a developmental item that can be used to assess PFAS-free DWR treatment efficacy. Additionally, NCTRF will evaluate the performance of non-PFAS repellent treated chem-bio protective garment materials developed by Army DEVCOM Soldier Center. PFAS is used as abbreviation for perfluoroalkyl substances and polyfluoroalkyl substances.						
Product Lifecycle Management System (\$140k) Currently, USN uniform and material data is spread among different databases and folders creating hours of research for NCTRF employee. USMC has successfully executed a beta test of PLM system, the Navy (alongside Army and Air Force) has an opportunity to cost share and create an organized and intuitive system for tracking and comparison as well as configuration management of pattern, testing , and design to facilitate uniform development. With an overall cost savings in the millions of dollars in the long term sustainment efforts as it aligns with uniform development						
Shipboard Cold Weather Clothing (CWC) System Development Follow-On (\$79k)						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603739N / Navy Logistic Productivity		Project (Number/Name) 3223 / Logistics R&D		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>To address the Navy's lack of shipboard CWC system, the FY21-FY22 development effort will deliver a recommendation for the shipboard CWC system components, prototypes for system components, findings from system assessment in a laboratory environment, and a draft Operational Requirements Document (ORD). Follow-on funding is required to execute a fit evaluation for the CWC system and a wear evaluation. Using the fit evaluation data, NCTRF will finalize garment technical data and designs for a wear evaluation. A user evaluation in a relevant operational environment is needed to validate the improved shipboard cold weather jacket and the shipboard CWC system performance.</p> <p>Validating the reduction of size blur with new proposed sizing system (\$67k) The need for size standardization within the Navy and across services has led to multi-year programs focusing on developing new sizing systems and conducting fit tests. Approximately four years ago the Navy teamed up with an industry partner and is now in its final phase. The industry partner, along with NCTRF, will conduct a fit test to evaluate and rate the efficacy of their recommended female sizes, shapes and statures of key style uniforms. In order for the Navy to move forward with the new sizing system with confidence that we are optimizing the tariff and limiting the possibility of size blur additional analysis is needed. This R&D effort will utilize the of the raw data collected during the fit test and conduct our own statistical analysis to validate the results provided by industry and further develop optimized tariffs that will ensure maximum differentiation of unique sizes with minimum SKUs.</p> <p>Lifecycle of a Uniform (\$37k) The lifecycle of a uniform is a frequently fielded question by NCTRF. This relates to sailor allowance as well as the overall ROI in updates or improvements of uniforms. This effort would be looking at further understanding the use of sustainable approaches with uniforms for the future but inorder to do that an establish baseline on the actual service and wear of a uniform will be a necessary data point as to understand. NCTRF can simulate durability but the actual timeline of a uniform service life has yet to be captured and understood. This effort will research all the sister areas approach to service life as well and also account for an actual or estimated service life of a navy uniform.</p> <p>3D Materials Library (\$37k) Through two consecutive R&D efforts, we have been successful in acquiring a COTS 3D software that is utilized to virtually sew together patterns to create true-to-life virtual prototypes. Through our research we have found that the key factor in ensuring that the virtual prototypes are exactly comparable to physical prototypes, is the detailed fabric characteristics are necessary. The next step in implementing 3D fully to streamline the development process is to have a full 3D material library. As technology advances, having accurate 3D</p>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603739N / Navy Logistic Productivity		Project (Number/Name) 3223 / Logistics R&D		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
prototyping services is becoming more in demand than ever. Having a cross-service 3D material library will further benefit our internal and external customers by providing a more affordable and sustainable development process. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: FY 2023 to FY 2024 decrease due to reduced level of effort for Alternatives to PFAS for Water and Stain Repellent Treatments for Navy Textiles, Product Lifecycle Management System, Shipboard Cold Weather Clothing (CWC) System Development Follow-On, Validating the reduction of size blur with new proposed sizing system, Lifecycle of a Uniform and 3D Materials Library.						
Accomplishments/Planned Programs Subtotals		0.643	0.899	0.712	0.000	0.712
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
NAVSUP R&D executed through firm fixed price negotiated contracts and NAVSUP support. Performance-based reviews conducted quarterly by the Project Management Office.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603739N / Navy Logistic Productivity				Project (Number/Name) 3223 / Logistics R&D					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Digital Logistics	C/FFP	NAVSUP AIT : Norfolk, VA	0.000	0.000		0.246	Jun 2023	0.195	Jun 2024	-		0.195	Continuing	Continuing	Continuing
Readiness through Logistics Solutions	C/FFP	Various : Various	1.700	0.131	Dec 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Supply Chain Optimization	C/FFP	Various : Various	0.466	0.131	Dec 2021	0.114	Apr 2023	0.090	Apr 2024	-		0.090	Continuing	Continuing	Continuing
Clothing Protection for the Warfighter	C/FFP	NCTRF : Natick,MA	2.079	0.381	Oct 2021	0.539	Mar 2023	0.427	Mar 2024	-		0.427	Continuing	Continuing	Continuing
Subtotal			4.245	0.643		0.899		0.712		-		0.712	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			4.245	0.643		0.899		0.712		-		0.712	Continuing	Continuing	N/A
Remarks															
In previous plans, NAVSUP forecast budget requirements based on projections rooted in the current year's capability gaps. As our priorities and Strategic Guidance evolves so do our budget requirements. Through leveraging new technologies, NAVSUP will enhance efforts for supply ashore and distant support. We will strengthen our supply chain information technology and management solutions for supply and financial requirements. We will collaborate with partners to improve the quality-of-life experiences and expand services to deployed forces. NAVSUP will continue to build an ethical and effective workforce dedicated to the mission by developing new technological programs that are advantageous to the warfighter. We will reduce risk and minimize vulnerabilities to protect against disruptions to supply chain and business systems. All of our actions will follow a culture of moral excellence to successfully execute the current and future missions of NAVSUP.															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603739N / Navy Logistic Productivity

Project (Number/Name)

3223 / Logistics R&D

Logistics R&D	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Supply Chain Optimization																												
Contract Award		◆				◆				◆				◆				◆				◆						
Developmental/Functional Testing			■				■				■				■				■				■					
Implementation				■				■				■				■				■				■				
Readiness through Logistics Solutions																												
Contract Award		◆																										
Developmental/Functional Testing			■																									
Implementation				■																								
3D Virtual Design Software Improvement																												
Contract Award							◆				◆				◆				◆				◆					
Developmental/Functional Testing								■				■				■				■				■				
Implementation												■				■				■				■				
Digital Logistics																												
Contract Award							◆				◆				◆				◆				◆					
Developmental/Functional Testing								■				■				■				■				■				
Implementation												■				■				■				■				
Clothing Protection for the Warfighter																												
Contract Award	◆				◆				◆				◆				◆				◆							
Developmental/Functional Testing		■				■				■				■				■				■						
Implementation			■				■				■				■				■				■					

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603739N / Navy Logistic Productivity	Project (Number/Name) 3223 / Logistics R&D	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Logistics R&D				
Supply Chain Optimization: Contract Award: FY 2022 Contract Award	2	2022	2	2022
Supply Chain Optimization: Contract Award: FY 2023 Contract Award	2	2023	2	2023
Supply Chain Optimization: Contract Award: FY 2024 Contract Award	2	2024	2	2024
Supply Chain Optimization: Contract Award: FY 2025 Contract Award	2	2025	2	2025
Supply Chain Optimization: Contract Award: FY 2026 Contract Award	2	2026	2	2026
Supply Chain Optimization: Contract Award: FY 2027 Contract Award	2	2027	2	2027
Supply Chain Optimization: Developmental/Functional Testing: FY 2022 Developmental/Functional Testing	3	2022	3	2022
Supply Chain Optimization: Developmental/Functional Testing: FY 2023 Developmental/Functional Testing	3	2023	3	2023
Supply Chain Optimization: Developmental/Functional Testing: FY 2024 Developmental/Functional Testing	3	2024	3	2024
Supply Chain Optimization: Developmental/Functional Testing: FY 2025 Developmental/Functional Testing	3	2025	3	2025
Supply Chain Optimization: Developmental/Functional Testing: FY 2026 Developmental/Functional Testing	3	2026	3	2026
Supply Chain Optimization: Implementation: FY 2022 Implementation	4	2022	4	2022
Supply Chain Optimization: Implementation: FY 2023 Implementation	4	2023	4	2023
Supply Chain Optimization: Implementation: FY 2024 Implementation	4	2024	4	2024
Supply Chain Optimization: Implementation: FY 2025 Implementation	4	2025	4	2025
Supply Chain Optimization: Implementation: FY 2026 Implementation	4	2026	4	2026
Supply Chain Optimization: Implementation: FY 2027 Implementation	4	2027	4	2027
Readiness through Logistics Solutions: Contract Award: FY 2022 Contract Award	2	2022	2	2022

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603739N / Navy Logistic Productivity		Project (Number/Name) 3223 / Logistics R&D	
Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Readiness through Logistics Solutions: Developmental/Functional Testing: FY 2022 Developmental/Functional Testing	3	2022	3	2022
Readiness through Logistics Solutions: Implementation: FY 2022 Implementation	4	2022	4	2022
3D Virtual Design Software Improvement: Contract Award: FY 2023 Contract Award	3	2023	3	2023
3D Virtual Design Software Improvement: Contract Award: FY 2024 Contract Award	3	2024	3	2024
3D Virtual Design Software Improvement: Contract Award: FY 2025 Contract Award	3	2025	3	2025
3D Virtual Design Software Improvement: Contract Award: FY 2026 Contract Award	3	2026	3	2026
3D Virtual Design Software Improvement: Contract Award: FY 2027 Contract Award	3	2027	3	2027
3D Virtual Design Software Improvement: Developmental/Functional Testing: FY 2023 Developmental/Functional Testing	3	2023	3	2023
3D Virtual Design Software Improvement: Developmental/Functional Testing: FY 2024 Developmental/Functional Testing	3	2024	3	2024
3D Virtual Design Software Improvement: Developmental/Functional Testing: FY 2025 Developmental/Functional Testing	3	2025	3	2025
3D Virtual Design Software Improvement: Developmental/Functional Testing: FY 2026 Developmental/Functional Testing	3	2026	3	2026
3D Virtual Design Software Improvement: Developmental/Functional Testing: FY 2027 Developmental/Functional Testing	3	2027	3	2027
3D Virtual Design Software Improvement: Implementation: FY 2023 Implementation	4	2023	4	2023
3D Virtual Design Software Improvement: Implementation: FY 2024 Implementation	4	2024	4	2024
3D Virtual Design Software Improvement: Implementation: FY 2025 Implementation	4	2025	4	2025
3D Virtual Design Software Improvement: Implementation: FY 2026 Implementation	4	2026	4	2026
3D Virtual Design Software Improvement: Implementation: FY 2027 Implementation	4	2027	4	2027
Digital Logistics: Contract Award: FY 2023 Contract Award	3	2023	3	2023
Digital Logistics: Contract Award: FY 2024 Contract Award	3	2024	3	2024
Digital Logistics: Contract Award: FY 2025 Contract Award	3	2025	3	2025
Digital Logistics: Contract Award: FY 2026 Contract Award	3	2026	3	2026
Digital Logistics: Contract Award: FY 2027 Contract Award	3	2027	3	2027

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603739N / Navy Logistic Productivity		Project (Number/Name) 3223 / Logistics R&D	
	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
Digital Logistics: Developmental/Functional Testing: FY 2023 Developmental/Functional Testing	3	2023	3	2023
Digital Logistics: Developmental/Functional Testing: FY 2024 Developmental/Functional Testing	3	2024	3	2024
Digital Logistics: Developmental/Functional Testing: FY 2025 Developmental/Functional Testing	3	2025	3	2025
Digital Logistics: Developmental/Functional Testing: FY 2026 Developmental/Functional Testing	3	2026	3	2026
Digital Logistics: Developmental/Functional Testing: FY 2027 Developmental/Functional Testing	3	2027	3	2027
Digital Logistics: Implementation: FY 2023 Implementation	4	2023	4	2023
Digital Logistics: Implementation: FY 2024 Implementation	4	2024	4	2024
Digital Logistics: Implementation: FY 2025 Implementation	4	2025	4	2025
Digital Logistics: Implementation: FY 2026 Implementation	4	2026	4	2026
Digital Logistics: Implementation: FY 2027 Implementation	4	2027	4	2027
Clothing Protection for the Warfighter: Contract Award: FY 2022 Contract Award	1	2022	1	2022
Clothing Protection for the Warfighter: Contract Award: FY 2023 Contract Award	1	2023	1	2023
Clothing Protection for the Warfighter: Contract Award: FY 2024 Contract Award	1	2024	1	2024
Clothing Protection for the Warfighter: Contract Award: FY 2025 Contract Award	1	2025	1	2025
Clothing Protection for the Warfighter: Contract Award: FY 2026 Contract Award	1	2026	1	2026
Clothing Protection for the Warfighter: Contract Award: FY 2027 Contract Award	1	2027	1	2027
Clothing Protection for the Warfighter: Developmental/Functional Testing: FY 2022 Developmental/Functional Testing	2	2022	2	2022
Clothing Protection for the Warfighter: Developmental/Functional Testing: FY 2023 Developmental/F4nctional Testing	2	2023	2	2023
Clothing Protection for the Warfighter: Developmental/Functional Testing: FY 2024 Developmental/Functional Testing	2	2024	2	2024

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603739N / Navy Logistic Productivity		Project (Number/Name) 3223 / Logistics R&D	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
Clothing Protection for the Warfighter: Developmental/Functional Testing: FY 2025 Developmental/Functional Testing		2	2025	2	2025
Clothing Protection for the Warfighter: Developmental/Functional Testing: FY 2026 Developmental/Functional Testing		2	2026	2	2026
Clothing Protection for the Warfighter: Developmental/Functional Testing: FY 2027 Developmental/Functional Testing		2	2027	2	2027
Clothing Protection for the Warfighter: Implementation: FY 2022 Implementation		3	2022	3	2022
Clothing Protection for the Warfighter: Implementation: FY 2023 Implementation		3	2023	3	2023
Clothing Protection for the Warfighter: Implementation: FY 2024 Implementation		3	2024	3	2024
Clothing Protection for the Warfighter: Implementation: FY 2025 Implementation		3	2025	3	2025
Clothing Protection for the Warfighter: Implementation: FY 2026 Implementation		3	2026	3	2026
Clothing Protection for the Warfighter: Implementation: FY 2027 Implementation		3	2027	3	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	PE 0603746N / <i>RETRACT MAPLE</i>											
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	275.379	363.874	420.455	-	420.455	493.403	528.612	458.092	436.139	Continuing	Continuing
1906: <i>Retract Maple</i>	0.000	275.379	363.874	420.455	-	420.455	493.403	528.612	458.092	436.139	Continuing	Continuing

A. Mission Description and Budget Item Justification

The details of this budget justification are classified, per Executive Order 13526, Sec 1.4 (a) and are submitted annually to Congress in the classified budget justification book.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	295.295	363.973	400.937	-	400.937
Current President's Budget	275.379	363.874	420.455	-	420.455
Total Adjustments	-19.916	-0.099	19.518	-	19.518
• Congressional General Reductions	-	-0.099			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-10.000	0.000			
• SBIR/STTR Transfer	-9.916	0.000			
• Program Adjustments	0.000	0.000	87.724	-	87.724
• Rate/Misc Adjustments	0.000	0.000	-68.206	-	-68.206

Change Summary Explanation

Technical: Not applicable.
Schedule: Not applicable.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	PE 0603748N / LINK PLUMERIA											
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	643.600	1,038.239	2,100.474	-	2,100.474	2,544.168	2,868.211	2,896.972	2,954.911	Continuing	Continuing
1978: <i>Link Plumeria</i>	0.000	643.600	1,038.239	572.288	-	572.288	338.775	233.419	214.780	219.074	Continuing	Continuing
2937: <i>Next Generation Fighter (F/A-XX)</i>	0.000	0.000	0.000	1,528.186	-	1,528.186	2,205.393	2,634.792	2,682.192	2,735.837	Continuing	Continuing

A. Mission Description and Budget Item Justification

The details of this budget justification are classified, per Executive Order 13526, Sec 1.4 (a) and are submitted annually to Congress in the classified budget justification book.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	663.780	1,038.661	2,366.442	-	2,366.442
Current President's Budget	643.600	1,038.239	2,100.474	-	2,100.474
Total Adjustments	-20.180	-0.422	-265.968	-	-265.968
• Congressional General Reductions	-	-0.422			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-20.180	0.000			
• Program Adjustments	0.000	0.000	-397.866	-	-397.866
• Rate/Misc Adjustments	0.000	0.000	131.898	-	131.898

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603748N / LINK PLUMERIA				Project (Number/Name) 1978 / Link Plumeria			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
1978: Link Plumeria	0.000	643.600	1,038.239	572.288	-	572.288	338.775	233.419	214.780	219.074	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The details of this budget justification are classified, per Executive Order 13526, Sec 1.4 (a) and are submitted annually to Congress in the classified budget justification book.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603748N / LINK PLUMERIA				Project (Number/Name) 2937 / Next Generation Fighter (F/A-XX)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2937: Next Generation Fighter (F/A-XX)	0.000	0.000	0.000	1,528.186	-	1,528.186	2,205.393	2,634.792	2,682.192	2,735.837	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603751N / RETRACT ELM							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	79.593	82.684	88.036	-	88.036	96.051	108.104	105.667	105.817	Continuing	Continuing
2003: Retract Elm	0.000	79.593	82.684	88.036	-	88.036	96.051	108.104	105.667	105.817	Continuing	Continuing

A. Mission Description and Budget Item Justification

The details of this budget justification are classified, per Executive Order 13526, Sec 1.4 (a) and are submitted annually to Congress in the classified budget justification book.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	82.241	83.445	78.017	-	78.017
Current President's Budget	79.593	82.684	88.036	-	88.036
Total Adjustments	-2.648	-0.761	10.019	-	10.019
• Congressional General Reductions	-	-0.761			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.648	0.000			
• Program Adjustments	0.000	0.000	13.521	-	13.521
• Rate/Misc Adjustments	0.000	0.000	-3.502	-	-3.502

Change Summary Explanation

Technical: Not applicable.
Schedule: Not applicable.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603764M / LINK EVERGREEN							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	254.492	313.409	547.005	-	547.005	478.616	480.965	514.882	434.445	Continuing	Continuing
1972: Link Evergreen	0.000	212.789	313.409	547.005	-	547.005	478.616	480.965	514.882	434.445	Continuing	Continuing
9999: Congressional Adds	0.000	41.703	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	41.703

A. Mission Description and Budget Item Justification

The details of this budget justification are classified, per Executive Order 13526, Sec 1.4 (a) and are submitted annually to Congress in the classified budget justification book.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	264.394	313.761	327.911	-	327.911
Current President's Budget	254.492	313.409	547.005	-	547.005
Total Adjustments	-9.902	-0.352	219.094	-	219.094
• Congressional General Reductions	-	-0.352			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-9.902	0.000			
• Rate/Misc Adjustments	0.000	0.000	219.094	-	219.094

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603764M / LINK EVERGREEN				Project (Number/Name) 1972 / Link Evergreen			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
1972: Link Evergreen	0.000	212.789	313.409	547.005	-	547.005	478.616	480.965	514.882	434.445	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The details of this budget justification are classified, per Executive Order 13526, Sec 1.4 (a) and are submitted annually to Congress in the classified budget justification book.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603764M / LINK EVERGREEN				Project (Number/Name) 9999 / Congressional Adds			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: Congressional Adds	0.000	41.703	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	41.703
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The details of this budget justification are classified, per Executive Order 13526, Sec 1.4 (a) and are submitted annually to Congress in the classified budget justification book.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603790N / NATO Research and Deve							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	113.551	5.805	8.041	6.265	-	6.265	8.691	8.482	7.918	8.077	Continuing	Continuing
2293: NATO Cooperative R & D	113.551	5.805	8.041	6.265	-	6.265	8.691	8.482	7.918	8.077	Continuing	Continuing

A. Mission Description and Budget Item Justification

In accordance with Title 10 United States Code, Section 2350a, this Program Element (PE) provides funding for research and development (R&D) programs with approved allies under international agreements. These funds can only be applied to work efforts in the U.S. The Under Secretary of Defense, Acquisition and Sustainment (USD, A&S) must approve each international agreement. The program provides funds for multiple projects under separately approved international agreements as well as funds that support the establishment of such agreements. Each international agreement is summarized in a separate Summary Statement of Intent (SSOI) that also states why the project serves to increase the defense capabilities of the U.S. The SSOI is used to obtain project approval by the Department of the Navy and the Office of the Secretary of Defense.

The North Atlantic Treaty Organization (NATO) R&D cooperative programs differ from other Research, Development, Test and Evaluation (RDT&E) programs because issuance of funding from this Program Element (PE) coincides with the signature of international agreements. These signatures occur throughout the fiscal year and often encounter unexpected delays during the staffing and negotiation phases of agreement processing prior to signature.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	5.805	8.041	7.977	-	7.977
Current President's Budget	5.805	8.041	6.265	-	6.265
Total Adjustments	0.000	0.000	-1.712	-	-1.712
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	-1.744	-	-1.744
• Rate/Misc Adjustments	0.000	0.000	0.032	-	0.032

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603790N / NATO Research and Deve				Project (Number/Name) 2293 / NATO Cooperative R & D			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2293: NATO Cooperative R & D	113.551	5.805	8.041	6.265	-	6.265	8.691	8.482	7.918	8.077	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In accordance with Title 10 United States Code, Section 2350a, this PE provides funding for research and development (R&D) programs with approved allies under international agreements. These funds can only be applied to work efforts in the U.S. The Under Secretary of Defense, Acquisition and Sustainment (USD, A&S) must approve each international agreement. The program provides funds for multiple projects under separately approved international agreements as well as funds that support the establishment of such agreements. Each international agreement is summarized in a separate Summary Statement of Intent (SSOI) that also states why the project serves to increase the defense capabilities of the U.S. The SSOI is used to obtain project approval by the Department of the Navy and the Office of the Secretary of Defense.

The North Atlantic Treaty Organization (NATO) R&D cooperative programs differ from other Research, Development, Test and Evaluation (RDT&E) programs because issuance of funding from this PE coincides with the signature of international agreements.

This NATO Research and Development program funds U.S. activities to support the identification and implementation of International Agreements (IAs) intended to address Chief of Naval Operations (CNO) priorities and identified interoperability gaps.

- Projects depend on commitment of U.S. and allies, and are subject to imprecise staffing timelines (funding typically provided when international agreement is signed, often later in the Fiscal Year (FY)).
- Funds must be identified/committed early (1-2 years prior) to indicate support during processing (in Summary Statement of Intent).
- These funds only constitute a portion of U.S. project funding.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: NATO Cooperative R & D	5.805	8.041	6.265	0.000	6.265
Articles:	-	-	-	-	-
FY 2023 Plans: -Continue to support approved Cooperative projects from prior Fiscal Years. -Plan and support approved FY 2023 Cooperative projects. Projects may include, but are not limited to: -Coalition Underwater Mine and IED Defeat (CUMID) PA [U.S., Canada, and Norway] -Compact Common Aperture Dual-Band IR Imaging (CCADBIRI) Band IR Imaging PA [U.S. and Israel]					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603790N / NATO Research and Deve		Project (Number/Name) 2293 / NATO Cooperative R & D		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div>-Electronic Warfare and Spectrum Superiority Development (EWSS-D) PA [U.S. and Israel]</div> <div>-Federated Information Sharing for Tactical Network (FIST) MOU [U.S., Germany, and Norway]</div> <div>-Maritime Automatic Surface Ship Classification (MASSC) PA [U.S. and Australia]</div> <div>-Next Generation Amphibious Technologies (NGAT) PA [U.S. and Japan]</div> <div>-Novel Degraded Visual Environments (Novel DVE) PA [U.S. and UK]</div> <div>-Quantum Enhanced Undersea Surveillance Technology (QuEST) PA [U.S. and Australia]</div> <div>-Submarine Technologies PA [U.S. and UK]</div> <div>-Undersea Technologies Capability Development PA [U.S. and Australia]</div> <div>FY 2024 Base Plans:</div> <div>-Continue to support approved Cooperative projects from prior Fiscal Years.</div> <div>-Plan and support approved FY 2024 Cooperative projects.</div> <div>Projects may include, but are not limited to:</div> <div>-Coalition Underwater Mine and IED Defeat (CUMID) PA [U.S., Canada, and Norway]</div> <div>-Compact Common Aperture Dual-Band IR Imaging (CCADBIRI) Band IR Imaging PA [U.S. and Israel]</div> <div>-Electronic Warfare and Spectrum Superiority Development (EWSS-D) PA [U.S. and Israel]</div> <div>-Federated Information Sharing for Tactical Network (FIST) MOU [U.S., Germany, and Norway]</div> <div>-Maritime Automatic Surface Ship Classification (MASSC) PA [U.S. and Australia]</div> <div>-Next Generation Amphibious Technologies (NGAT) PA [U.S. and Japan]</div> <div>-Novel Degraded Visual Environments (Novel DVE) PA [U.S. and UK]</div> <div>-Quantum Enhanced Undersea Surveillance Technology (QuEST) PA [U.S. and Australia]</div> <div>-Submarine Technologies PA [U.S. and UK]</div> <div>-Undersea Technologies Capability Development PA [U.S. and Australia]</div> <div>FY 2024 OCO Plans:</div> <div>N/A</div> <div>FY 2023 to FY 2024 Increase/Decrease Statement:</div> <div>The FY 2024 funding decrease of \$1.776M is due to reductions in new start key enabler partnership building technology and development programs addressing U.S. Department of Navy (DoN) capability gaps.</div>						
Accomplishments/Planned Programs Subtotals		5.805	8.041	6.265	0.000	6.265
C. Other Program Funding Summary (\$ in Millions)						
N/A						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603790N / NATO Research and Deve	Project (Number/Name) 2293 / NATO Cooperative R & D
C. Other Program Funding Summary (\$ in Millions)		
Remarks		
D. Acquisition Strategy		
N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603790N / NATO Research and Deve				Project (Number/Name) 2293 / NATO Cooperative R & D					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test and Evaluation	C/FP	NAVSEA : Washington Navy Yard, DC	28.745	0.000		1.000	Feb 2023	0.750	Dec 2023	-		0.750	Continuing	Continuing	Continuing
Developmental Test and Evaluation	C/FP	NSWC : West Bethesda, MD	13.821	0.000		0.500	Nov 2022	0.400	Nov 2023	-		0.400	Continuing	Continuing	Continuing
Developmental Test and Evaluation	C/FP	NUWC : Newport, RI	3.786	0.000		0.300	Dec 2022	0.300	Jan 2024	-		0.300	Continuing	Continuing	Continuing
Developmental Test and Evaluation	C/FP	NIWC : San Diego, CA	8.075	0.350	Nov 2021	0.400	Mar 2023	0.400	Jan 2024	-		0.400	Continuing	Continuing	Continuing
Developmental Test and Evaluation	C/FP	NAVAIR : Patuxent River, MD	4.457	0.284	Dec 2021	0.400	Nov 2022	0.300	May 2024	-		0.300	Continuing	Continuing	Continuing
Developmental Test and Evaluation	C/FP	NRL : Washington, DC	10.056	3.260	Mar 2022	2.741	Feb 2023	1.765	Dec 2023	-		1.765	Continuing	Continuing	Continuing
Developmental Test and Evaluation	C/FP	NAWC : Point Mugu, CA	7.910	0.000		0.500	Dec 2022	0.400	Mar 2024	-		0.400	Continuing	Continuing	Continuing
Deveiopmental Test and Eevaluation	C/FP	MARCOR : Washington.DC	1.200	0.000		0.000		0.000		-		0.000	0.000	1.200	-
Developmental Test and Eevaluation	C/FP	NSWCCD : Carderock, MD	3.829	0.000		0.000		0.000		-		0.000	0.000	3.829	-
Developmental Test and Evaluation	C/FP	ONR : Arlington, VA	4.195	0.500	Dec 2021	0.800	Mar 2023	0.750	Nov 2023	-		0.750	0.000	6.245	-
Developmental Test and Evaluation	C/FP	USMC : Quantico, VA	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	-
Developmental Test and Eevaluation	C/FP	NSWC : Indian Head, MD	0.750	0.000		0.200	Dec 2022	0.200	Nov 2023	-		0.200	0.000	1.150	-
Developmental Test and Eevaluation	C/FP	NSWC : Panama City , FL	0.550	0.300	Feb 2022	0.400	Feb 2023	0.400	Apr 2024	-		0.400	0.000	1.650	-
Developmental Test and Eevaluation	C/FP	GSA : Washington, DC	0.800	0.000		0.000		0.000		-		0.000	0.000	0.800	-
Developmental Test and Eevaluation	C/FP	DISA : Ft Meade MD	1.410	0.000		0.000		0.000		-		0.000	0.000	1.410	-
Developmental Test and Eevaluation	C/FP	CDSA : Dam Neck, VA	3.574	0.238	Nov 2021	0.000		0.000		-		0.000	0.000	3.812	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603790N / NATO Research and Deve				Project (Number/Name) 2293 / NATO Cooperative R & D					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			93.658	4.932		7.241		5.665		-		5.665	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/FP	NIPO : Washington Navy Yard	19.893	0.873	May 2022	0.800	May 2023	0.600	Nov 2023	-		0.600	0.000	22.166	-
Subtotal			19.893	0.873		0.800		0.600		-		0.600	0.000	22.166	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			113.551	5.805		8.041		6.265		-		6.265	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy										Date: March 2023									
Appropriation/Budget Activity										R-1 Program Element (Number/Name)									
1319 / 4										PE 0603790N / NATO Research and Deve									
										Project (Number/Name)									
										2293 / NATO Cooperative R & D									

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 2293																												
International Agreements																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603790N / NATO Research and Deve	Project (Number/Name) 2293 / NATO Cooperative R & D

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2293				
International Agreements	1	2022	4	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603795N / Land Attack Tech							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	29.629	3.922	0.358	1.624	-	1.624	1.717	1.238	1.222	1.209	Continuing	Continuing
2038: ADVANCED MINOR CALIBER GUN	29.629	3.922	0.358	1.624	-	1.624	1.717	1.238	1.222	1.209	Continuing	Continuing

A. Mission Description and Budget Item Justification

Project 2038: The 25mm MK 38 MOD 2 and MOD 3 Machine Gun Systems (MGS) provide Anti-Surface Warfare (ASUW) and Anti-terrorism and Force Protection (AT/FP) capability as a simple, stabilized, low cost solution to outfit near-term deployers to counter small boat threats. Over 360 U.S. Navy-owned systems are installed on U.S. Navy AS, CG, CVN, DDG, LCC, LHA, LHD, LSD, OSV, PC class ships, MK VI Patrol Boats and U.S. Coast Guard Fast Response Cutters. Established in order to respond to Joint Urgent Operational Need Statement (JUONS) CC-0558 for Counter Unmanned Aerial Systems (C-UAS), the MK 38 MOD 3 MGS's electro-optical/infra-red sensor, hardware, and software are being upgraded to counter emerging unmanned aerial threats. Initial C-UAS capability was fielded in Q1FY20. Incremental improvements are being made to this C-UAS capability, for cybersecurity and to address operability issues. The 30mm MK 38 MOD 4 Gun Weapon System, will introduce greater accuracy, lethality, and effective range for C-UAS and Counter Unmanned Surface Vehicle (C-USV) capability with integration to highly accurate fire control system, 30mm gun, targeting sensor and AEGIS combat system. The MOD 4 will be fielded on all DDG 51 Flight IIA and Flight III AEGIS Destroyers. Project 2038 provides qualification and logistics development of the 30mm MK 38 MOD 4. This will include Function Integration Testing, Functional Acceptance Testing, AEGIS Light-off, Structural Test Firing, and an at-sea Quick Reaction Assessment (on board DDG 91). Upgrading fielded 25mm MK 38 MGS to MOD 3 with C-UAS and concurrently developing and fielding the MOD 4 GWS on all current and future DDG 51 Flight IIA and Flight III Destroyers is the fastest and most cost-effective way to field critical C-UAS ship self-defense capability.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	4.017	0.358	2.009	-	2.009
Current President's Budget	3.922	0.358	1.624	-	1.624
Total Adjustments	-0.095	0.000	-0.385	-	-0.385
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.095	0.000			
• Program Adjustments	0.000	0.000	-0.407	-	-0.407
• Rate/Misc Adjustments	0.000	0.000	0.022	-	0.022

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0603795N / Land Attack Tech
<div>Change Summary Explanation</div> <div>FY 2022 includes \$0.000M in OOC execution.</div> <div>FY 2023 includes \$0.000M in OOC enacted budget.</div> <div>FY 2024 includes \$15.00M for the OOC budget request.</div>		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603795N / Land Attack Tech				Project (Number/Name) 2038 / ADVANCED MINOR CALIBER GUN			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2038: ADVANCED MINOR CALIBER GUN	29.629	3.922	0.358	1.624	-	1.624	1.717	1.238	1.222	1.209	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 2038: The 25mm MK 38 MOD 2 and MOD 3 Machine Gun Systems (MGS) provide Anti-Surface Warfare (ASUW) and Anti-terrorism and Force Protection (AT/FP) capability as a simple, stabilized, low cost solution to outfit near-term deployers to counter small boat threats. Over 360 U.S. Navy-owned systems are installed on U.S. Navy AS, CG, CVN, DDG, LCC, LHA, LHD, LSD, OSV, PC class ships, MK VI Patrol Boats and U.S. Coast Guard Fast Response Cutters. Established in order to respond to Joint Urgent Operational Need Statement (JUONS) CC-0558 for Counter Unmanned Aerial Systems (C-UAS), the MK 38 MOD 3 MGS's electro-optical/infra-red sensor, hardware, and software are being upgraded to counter emerging unmanned aerial threats. Initial C-UAS capability was fielded in Q1FY20. Incremental improvements are being made to this C-UAS capability, for cybersecurity and to address operability issues. The 30mm MK 38 MOD 4 Gun Weapon System, will introduce greater accuracy, lethality, and effective range for C-UAS and Counter Unmanned Surface Vehicle (C-USV) capability with integration to highly accurate fire control system, 30mm gun, targeting sensor and AEGIS combat system. The MOD 4 will be fielded on all DDG 51 Flight IIA and Flight III AEGIS Destroyers. Project 2038 provides qualification and logistics development of the 30mm MK 38 MOD 4. This will include Function Integration Testing, Functional Acceptance Testing, AEGIS Light-off, Structural Test Firing, and an at-sea Quick Reaction Assessment (on board DDG 91). Upgrading fielded 25mm MK 38 MGS to MOD 3 with C-UAS and concurrently developing and fielding the MOD 4 GWS on all current and future DDG 51 Flight IIA and Flight III Destroyers is the fastest and most cost-effective way to field critical C-UAS ship self-defense capability.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Systems Engineering and Testing	3.922	0.358	1.624	0.000	1.624
Articles:	-	-	-	-	-
FY 2023 Plans: <ul style="list-style-type: none"> - Continue Functional Integration Test of 30mm MK 38 MOD 4 GWS - Continue planning for Quick Reaction Assessment of prototype 30mm MK 38 MOD 4 GWS - Begin combat system certification and element certification - Begin variance qualification for Initial Operational Capability (IOC) configuration 					
FY 2024 Base Plans: <ul style="list-style-type: none"> - Continue planning and perform Quick Reaction Assessment of prototype 30mm MK 38 MOD 4 GWS - Complete combat system certification and element certification 					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603795N / <i>Land Attack Tech</i>		Project (Number/Name) 2038 / <i>ADVANCED MINOR CALIBER GUN</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Perform and complete qualification re-testing on components upgraded to support FY25 Initial Operational Capability (IOC) <i>FY 2024 OCO Plans:</i> N/A <i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> FY23 to FY24 \$1.266 increase attributed to performing Quick Reaction Assessment of prototype 30mm MK 38 MOD 4 GWS, completing combat system certification and element certification, and performing qualification re-testing on components upgraded to support FY25 Initial Operational Capability.						
Accomplishments/Planned Programs Subtotals		3.922	0.358	1.624	0.000	1.624
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
Engineering and technical services to support qualification and ILS development for the 30mm MK 38 MOD 4 GWS in FY22-24 is being procured from Naval Surface Warfare Center (NSWC) Dahlgren (VA), NSWC Indian Head Picatinny, and NSWC Crane.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603795N / <i>Land Attack Tech</i>	Project (Number/Name) 2038 / <i>ADVANCED MINOR CALIBER GUN</i>
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Counter-UAS (JUONS CC-0558) Primary Product Integration	SS/BOA	BAE Systems : Minneapolis MN	15.824	0.000		0.000		0.000		-		0.000	0.000	15.824	-
30mm MK 38 MOD 4 Electro-optical Sensor/ Gun Mount Performance Demonstration	C/CPFF	BAE Systems : Minneapolis, MN	1.641	0.000		0.000		0.000		-		0.000	0.000	1.641	-
30mm MK 38 MOD 4 Electro-optical Sensor/ Gun Mount Performance Demonstration	C/CPFF	MSI-Defence Systems : Rock Hill, SC	0.575	0.000		0.000		0.000		-		0.000	0.000	0.575	-
Subtotal			18.040	0.000		0.000		0.000		-		0.000	0.000	18.040	N/A

Remarks

-

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Services	WR	NSWC, DD : Dahlgren, VA	9.868	3.532	Nov 2021	0.358	Nov 2022	1.309	Nov 2023	-		1.309	Continuing	Continuing	Continuing
Government Engineering Services	WR	NSWC, IHD : Picatinny, NJ	1.318	0.000	Nov 2021	0.000		0.157	Nov 2023	-		0.157	Continuing	Continuing	Continuing
Government Engineering Services	WR	NSWC, CR : Crane, IN	0.403	0.390	Nov 2021	0.000		0.158	Nov 2023	-		0.158	Continuing	Continuing	Continuing
Subtotal			11.589	3.922		0.358		1.624		-		1.624	Continuing	Continuing	N/A

Remarks

Government Engineering Services: NSWC Dahlgren provides engineering services for gun weapon system technical direction and test engineering. NSWC IHD provides engineering services for gun weapon system configuration management, logistics, and in-service engineering. NSWC Crane provides engineering services for electro-optical sensor technical direction and test engineering.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603795N / Land Attack Tech					Project (Number/Name) 2038 / ADVANCED MINOR CALIBER GUN			
	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	29.629	3.922		0.358		1.624		-		1.624	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603795N / <i>Land Attack Tech</i>			Project (Number/Name) 2038 / <i>ADVANCED MINOR CALIBER GUN</i>

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 2038																												
Counter-UAS (JUONS CC-0558): Qualification and Certification of Follow-on Software Baseline																												
30mm MK 38 MOD 4 GWS: Limited Qualification of Prototype Gun Weapon System																												
30mm MK 38 MOD 4 GWS: Preliminary logistics development																												
30mm MK 38 MOD 4 GWS: Functional Integration Test																												
30mm MK 38 MOD 4 GWS: Plan & Execute Quick Reaction Assessment																												
30mm MK 38 MOD 4 GWS: Evaluate 30mm Ammunition Candidate for GWS Integration																												
30mm MK 38 MOD 4 GWS: Perform variance qualification for IOC configuration																												
30mm MK 38 MOD 4 GWS: Complete element & combat system certifications																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603795N / Land Attack Tech	Project (Number/Name) 2038 / ADVANCED MINOR CALIBER GUN

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2038				
Counter-UAS (JUONS CC-0558): Qualification and Certification of Follow-on Software Baseline	3	2022	4	2022
30mm MK 38 MOD 4 GWS: Limited Qualification of Prototype Gun Weapon System	1	2022	4	2022
30mm MK 38 MOD 4 GWS: Preliminary logistics development	1	2022	3	2022
30mm MK 38 MOD 4 GWS: Functional Integration Test	4	2022	2	2023
30mm MK 38 MOD 4 GWS: Plan & Execute Quick Reaction Assessment	1	2022	4	2024
30mm MK 38 MOD 4 GWS: Evaluate 30mm Ammunition Candidate for GWS Integration	1	2022	4	2022
30mm MK 38 MOD 4 GWS: Perform variance qualification for IOC configuration	1	2023	4	2024
30mm MK 38 MOD 4 GWS: Complete element & combat system certifications	1	2023	1	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603851M / <i>Joint Non-Lethal Weapons Testing</i>
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	654.013	27.556	30.533	31.058	-	31.058	33.837	33.885	33.888	34.577	Continuing	Continuing
2319: <i>Non-Lethal Weapons</i>	654.013	27.556	30.533	31.058	-	31.058	33.837	33.885	33.888	34.577	Continuing	Continuing

A. Mission Description and Budget Item Justification

The DoD Non-Lethal Weapons Program was established by the FY 1996 National Defense Authorization Act. The Office of the Secretary of Defense designated the Commandant of the Marine Corps as the DoD NLW Executive Agent (EA). The EA exercises centralized responsibility for joint research and development of non-lethal weapons and technology through the Joint Non-Lethal Weapons Program (JNLWP). The Office of the Under Secretary of Defense for Acquisition and Sustainment serves as the OSD Principal Staff Assistant and oversees, in consultation with the Under Secretary of Defense for Policy, the DoD NLW Executive Agent.

The efforts described in this Program Element (PE) reflect Joint Service research and development (R&D) investment decisions by the Joint Non-Lethal Weapons Integrated Product Team, a multi-service flag level corporate board that provides executive oversight and management of the JNLWP for the EA. Research conducted is based on the requirements and capabilities sought by the Services and the Coast Guard, as identified in JROC-approved Joint Non-Lethal Effects Initial Capabilities Documents. This coordinated Joint Research and Development approach addresses mutual capability gaps and assures the most relevant non-lethal technologies, capabilities, and equipment are provided to the Joint Force while eliminating duplicative Service investment. Advanced Component Development and Prototypes non-lethal weapons initiatives provide non-lethal capabilities in direct support of the National Defense Strategy objective of strategic competition by providing options to the Joint Force in pursuit of national objectives in legal or policy constrained scenarios, as well as complementing the use of lethal effects in complex combat scenarios, for example, in urban environments with large civilian populations. Ongoing NLW studies, analyses, and exercise efforts with NATO and Allies also support NDS objectives to strengthen alliances and partnerships. Resulting capabilities facilitate a fully integrated non-lethal competency as a complement to lethal firepower, providing force application options for below lethal threshold engagements.

This PE funds Joint Service research, development, test, and evaluation of non-lethal weapons, devices, munitions, and technologies which provide a non-lethal capability to minimize significant injuries as well as undesired damage to property and the environment. Counter-personnel and counter-materiel capability investment areas include directed energy (lasers, millimeter wave, and high power microwave), multi-sensory suppression/incapacitation initiatives (acoustics, optical, electro-muscular incapacitation), and other emergent technologies transitioning from coordinated JNLWP Science and Technology PE initiatives. Investments also focus on Joint and allied experimentation, exercise, demonstration, and assessment of advanced component and prototype initiatives in order to assist transition of suitable and effective capabilities to both joint and allied operational applications.

The Joint Intermediate Force Capabilities Office JIFCO (formally Joint Non-Lethal Weapons Directorate) is designated as a R&D organization and was established by the EA to manage the day to day research and development activities of the DoD's JNLWP. Each Service is responsible for their procurement and operating support costs.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0603851M / Joint Non-Lethal Weapons Testing			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	28.168	30.533	32.370	-	32.370
Current President's Budget	27.556	30.533	31.058	-	31.058
Total Adjustments	-0.612	0.000	-1.312	-	-1.312
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.612	0.000			
• Program Adjustments	0.000	0.000	-1.437	-	-1.437
• Rate/Misc Adjustments	0.000	0.000	0.125	-	0.125
Change Summary Explanation					
Increase from FY 2023 to FY 2024 of \$0.525M is primarily due to inflation.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603851M / Joint Non-Lethal Weapons Testing				Project (Number/Name) 2319 / Non-Lethal Weapons			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2319: Non-Lethal Weapons	654.013	27.556	30.533	31.058	-	31.058	33.837	33.885	33.888	34.577	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This project Non-Lethal Weapons (NLW) develops and fields NLW intermediate force capabilities between presence and lethal effects in support of national interests.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Counter-Personnel Advanced Component Development and Prototypes								4.914	8.638	8.376	0.000	8.376
								Articles: -	-	-	-	-
FY 2023 Plans:												
<ul style="list-style-type: none">- Initiate Intermediate Force Capabilities Unmanned System Integration (IFCUSI) integration Initiate development of a ruggedized demonstrator, integrated onto an unmanned or autonomous platform, as appropriate, for identified stakeholders.- Initiate Integrated Base Defense (IBD) mature IFC integration into a containerized weapon system prototype demonstrator.- Continue maturation of counter-personnel (CP) directed energy technologies to increase system efficiencies and reduce system size, weight, and cost in preparation for transition to joint acquisition programs of record.- Continue development of CP emerging technologies to support Service capability gaps and priorities as they support the Combatant Commanders.- Continue technology maturation and risk reduction of competing approaches to inform decisions for Service capability development.- Continue prototype development and assessment of advanced payloads for technological capabilities relevant to emerging counter-personnel capability gaps.- Continue coordination and requirements development for Service counter-personnel (CP) prototyping initiatives within the Joint Non-Lethal Weapons Program.- Continue Service-led CP intermediate force prototype initiatives.- Continue prototype development and demonstration for the most promising technologies employing multisensory stimuli.- Continue program management support for CP efforts.												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603851M / Joint Non-Lethal Weapons Testing		Project (Number/Name) 2319 / Non-Lethal Weapons		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div><div>- Continue integration of current intermediate force capabilities into an established service platform for demonstration and prototyping purposes.</div><div>- Continue sound and light acoustic technology evaluation.</div><div>- Continue Escalation of Force Common Remotely Operated Weapons Station (EoFCROWS).</div><div>- Complete sound and light high intensity light evaluation.</div></div> <div><div>FY 2024 Base Plans:</div><div>- Continue Intermediate Force Capabilities Unmanned System Integration (IFCUSI) Initiate development of a ruggedized demonstrator, integrated into an unmanned or autonomous platform, as appropriate, for identified stakeholders.</div><div>- Continue Integrated Base Defense (IBD) mature integration of IFCs into a containerized weapon system prototype demonstrator.</div><div>- Continue maturation of counter-personnel (CP) directed energy technologies to increase system efficiencies, reduce system size, weight, and cost in preparation for transition to joint acquisition programs of record.</div><div>- Continue development of CP emerging technologies to support Service capability gaps and priorities as they support the Combatant Commanders.</div><div>- Continue technology maturation and risk reduction of competing approaches to inform decisions for Service capability development of Directed Energy.</div><div>- Continue prototype development and assessment of advanced payloads for technological capabilities relevant to emerging counter-personnel capability gaps.</div><div>- Continue coordination and requirements development for Service counter-personnel (CP) prototyping initiatives within the Joint Non-Lethal Weapons Program.</div><div>- Continue Service-led CP intermediate force prototype initiatives.</div><div>- Continue prototype development and demonstration for the most promising technologies employing multisensory stimuli.</div><div>- Continue program management support for CP efforts.</div><div>- Continue integration of current intermediate force capabilities into an established service platform for demonstration and prototyping.</div><div>- Continue sound and light acoustic technology evaluation.</div><div>- Complete Escalation of Force effector integration and testing on Common Remotely Operated Weapons Station (EoF CROWS).</div></div> <div><div>FY 2024 OCO Plans:</div></div>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603851M / Joint Non-Lethal Weapons Testing		Project (Number/Name) 2319 / Non-Lethal Weapons		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: Decrease from FY 2023 to FY 2024 is due to Unmanned System integration efforts focused on continued requirements development and novel prototype identification to support lower risk prototype development planning due to Service integration plan changes.						
Title: Counter-Materiel Advanced Component Development and Prototypes		13.549	10.100	11.906	0.000	11.906
Articles:		-	-	-	-	-
FY 2023 Plans: - Initiate Vessel Stopping Prototype to conduct system Factory Acceptance Testing and comprehensive planning for waterborne requirements verification Government Acceptance Testing, and executing DoN major safety and regulatory milestones. - Continue advanced component development and prototyping support to the Department of the Navy's candidate Maritime Vessel Stopping capability. (Vessel Stopping Prototype) - Continue development of the conceptual design of non-lethal directed energy vessel-stopping capability, including electromagnetic and engagement modeling, platform feasibility and integration studies, target characterization, and validation. - Continue maturation of counter-materiel (CM) directed energy technologies to increase system efficiencies and reduce system size, weight, and cost in preparation for transition to joint acquisition programs of record. - Continue coordination and requirements development for Service CM prototyping initiatives within the Joint Non-Lethal Weapons Program. - Continue development and assessment of Service-led CM intermediate force prototype initiatives. - Continue maturation of CM directed energy technologies to increase system efficiencies such as reduce system size, weight, and cost in preparation for transition to joint acquisition programs of record. - Continue the advanced development of CM emerging technologies to support Service capability gaps and priorities as they support the Combatant Commanders. - Continue technology maturation and risk reduction of competing approaches to inform decisions for Service capability development. - Continue prototype development and assessment of advanced payloads for technological capabilities relevant to emerging counter-materiel capability gaps. - Continue program management support for CM efforts.						
FY 2024 Base Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603851M / Joint Non-Lethal Weapons Testing		Project (Number/Name) 2319 / Non-Lethal Weapons		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div>- Continue Vessel Stopping Prototype to conduct system Factory Acceptance Testing and comprehensive planning for waterborne requirements verification Government Acceptance Testing and executing DoN major safety and regulatory milestones.</div> <div>- Continue development of the conceptual design of non-lethal directed energy vessel-stopping capability, including electromagnetic and engagement modeling, platform feasibility and integration studies, target characterization, and validation.</div> <div>- Continue maturation of counter-materiel (CM) directed energy technologies to increase system efficiencies, reduce system size, weight, and cost in preparation for transition to joint acquisition programs of record.</div> <div>- Continue coordination and requirements development for Service CM prototyping initiatives within the Joint Non-Lethal Weapons Program.</div> <div>- Continue development and assessment of Service-led CM intermediate force prototype initiatives.</div> <div>- Continue the advanced development of CM emerging technologies to support Service capability gaps and priorities as they support the Combatant Commanders.</div> <div>- Continue technology maturation and risk reduction of competing approaches to inform decisions for Service capability development.</div> <div>- Continue prototype development and assessment of advanced payloads for technological capabilities relevant to emerging counter-materiel capability gaps.</div> <div>- Continue program management support for CM efforts.</div> <div>- Complete advanced component development and prototyping support to the Department of the Navy's candidate Maritime Vessel Stopping capability. (Vessel Stopping Prototype)</div> <div>FY 2024 OCO Plans: N/A</div> <div>FY 2023 to FY 2024 Increase/Decrease Statement: Increase from FY 2023 to FY 2024 is due to increased interest by multiple Services in short range Directed Energy prototype development.</div>						
Title: Joint and Allied Exercise, Experimentation, Demonstration, and Assessment <div>Articles:</div>		9.093 -	11.795 -	10.776 -	0.000 -	10.776 -
FY 2023 Plans: - Continue support to Combatant Commands (CCMDs) by demonstrating and assessing intermediate force capabilities in vessel interdiction and counter-migration exercises. Specifically, continue support to USEUCOM/USAFRICOM through engagement with NATO's Maritime Interdiction Operations Training Center (MIOTC).						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603851M / Joint Non-Lethal Weapons Testing		Project (Number/Name) 2319 / Non-Lethal Weapons		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div><div>- Continue modeling and simulation of intermediate force capabilities in warfighter training/gaming models and performance effects data collection/population to demonstrate/analyze non-lethal effects and support optimization of training.</div><div>- Continue evaluation of intermediate force capabilities by Service warfighting laboratories and Joint Staff, J7, Joint and Coalition Warfighting for direct user feedback of various non-lethal (NL) technologies and munitions to include policy and strategy and strategic communication.</div><div>- Continue engagement with NATO on cooperative security efforts, to include providing input for Systems Analysis and Studies (SAS) Panels and NATO assessment of intermediate force capabilities in appropriate allied scenarios and exercises.</div><div>- Continue interaction with Combatant Commander Staffs to evaluate emerging intermediate force capabilities and their utility in theater operations and Defense of the Homeland missions.</div><div>- Continue to assess the utility, effect, and effectiveness of technologies for incapacitating personnel, clearing facilities, stopping vehicles and vessels, and denying enemy access to protected areas.</div><div>- Continue to identify, test, and evaluate newly developed commercial products that may meet Joint service requirements for specific non-lethal capability set common items.</div><div>- Continue program management support for Joint and Allied Exercise, Experimentation, Demonstration, and Assessment efforts.</div><div>- Continue support of CCMDs by demonstrating and assessing intermediate force capabilities for multiple priority mission areas, such as port opening operations; Humanitarian Assistance and Disaster Relief, Counter-Transnational Organized Crime operations; and harbor and in-transit security operations</div></div> <div><div>FY 2024 Base Plans:</div><div>- Continue support to Combatant Commands (CCMDs) by demonstrating and assessing intermediate force capabilities in vessel interdiction and counter-migration exercises.</div><div>- Continue modeling and simulation of intermediate force capabilities in warfighter training/gaming models and performance effects data collection/population to demonstrate/analyze non-lethal effects and support optimization of training.</div><div>- Continue evaluation of intermediate force capabilities by Service warfighting laboratories and Joint Staff, J7, Joint and Coalition Warfighting for direct user feedback of various non-lethal (NL) technologies and munitions to include policy and strategy and strategic communication.</div></div>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603851M / <i>Joint Non-Lethal Weapons Testing</i>		Project (Number/Name) 2319 / <i>Non-Lethal Weapons</i>	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<ul style="list-style-type: none"> - Continue engagement with NATO on cooperative security efforts, to include providing input for Systems Analysis and Studies (SAS) Panels and NATO assessment of intermediate force capabilities in appropriate allied scenarios and exercises. - Continue interaction with Combatant Commander Staffs to evaluate emerging intermediate force capabilities and their utility in theater operations and Defense of the Homeland missions. - Continue to assess the utility, effect, and effectiveness of technologies for incapacitating personnel, clearing facilities, stopping vehicles and vessels, and denying enemy access to protected areas. - Continue to identify, test, and evaluate newly developed commercial products that may meet Joint service requirements for specific non-lethal capability set common items. - Continue program management support for Joint and Allied Exercise, Experimentation, Demonstration, and Assessment efforts. - Continue support of CCMDs by demonstrating and assessing intermediate force capabilities for multiple priority mission areas, such as port opening operations; Humanitarian Assistance and Disaster Relief, Contested Logistics; and harbor and in-transit security operations. <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Decrease from FY 2023 to FY 2024 is due to improved efficiencies across many projects and efforts. Resources due to cost savings were reallocated for high priority technology development efforts.</p>					
Accomplishments/Planned Programs Subtotals	27.556	30.533	31.058	0.000	31.058

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTEN/0602651M/0000: <i>Joint Non-Lethal Weapons Applied Research</i>	6.213	6.659	7.419	-	7.419	8.090	8.345	8.512	8.682	Continuing	Continuing
• RDTEN/0603651M/3022: <i>Joint Non-Lethal Weapons Advanced Technology Development</i>	13.026	14.048	15.556	-	15.556	16.967	17.504	17.855	18.212	Continuing	Continuing
Remarks											

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603851M / Joint Non-Lethal Weapons Testing	Project (Number/Name) 2319 / Non-Lethal Weapons

D. Acquisition Strategy

The Joint Non-Lethal Weapons (JNLW) program strategy is to pursue the fielding of NLW systems through modifying commercial-off-the-shelf (COTS) products for near term capabilities and the development of new technology NLW systems in various stages of acquisition. These are balanced with efforts in state-of-the-art technology investment, experimentation, and modeling and simulation. The acquisition strategy for each weapon system is largely Lead Service dependent. For complex development programs, JNLWP RDT&E funding supports each Service's RDT&E joint application efforts.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603851M / Joint Non-Lethal Weapons Testing					Project (Number/Name) 2319 / Non-Lethal Weapons				
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
NLW Product Development	MIPR	ARDEC : Picatinny, NJ	62.838	0.708	Jan 2022	1.100	Jan 2023	0.605	Jan 2024	-		0.605	Continuing	Continuing	Continuing
NLW Product Development	Various	NSWC : Various	71.577	7.162	Dec 2021	9.269	Dec 2022	7.163	Dec 2023	-		7.163	Continuing	Continuing	Continuing
NLW Product Development	MIPR	USAF : Ft. Sam Houston AFB, TX	60.727	0.412	Jan 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
NLW Product Development	Various	MCSC : Quantico, VA	40.915	4.440	Nov 2021	4.696	Nov 2022	6.273	Nov 2023	-		6.273	Continuing	Continuing	Continuing
NLW Product Development	Various	Uniformed Services : Various	207.348	5.391	Oct 2021	6.567	Oct 2022	6.387	Oct 2023	-		6.387	Continuing	Continuing	Continuing
Prior Year NLW Product Development	Various	Various : Various	91.741	0.000		0.000		0.000		-		0.000	0.000	91.741	-
Subtotal			535.146	18.113		21.632		20.428		-		20.428	Continuing	Continuing	N/A
Remarks															
Joint Program funds are prioritized and provided to the USA, USAF, USN, USMC, SOCOM, and USCG in support of NLW research and development efforts. Each Cost Category Item does not correlate to an individual project/effort. They fund multiple non-lethal projects/efforts that are incrementally funded throughout the fiscal year as each service identifies the project/effort requiring funding.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
NLW Support Cost	WR	NSWC : Dahlgren, VA	19.629	1.121	Nov 2021	0.277	Nov 2022	0.230	Nov 2023	-		0.230	Continuing	Continuing	Continuing
Subtotal			19.629	1.121		0.277		0.230		-		0.230	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603851M / Joint Non-Lethal Weapons Testing				Project (Number/Name) 2319 / Non-Lethal Weapons					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
JNLW Management Support	Various	MCSC : Quantico, VA	58.517	8.322	Oct 2021	8.624	Oct 2022	10.400	Oct 2023	-		10.400	Continuing	Continuing	Continuing
Prior Year Management Services	Various	Various : Various	40.721	0.000		0.000		0.000		-		0.000	0.000	40.721	-
Subtotal			99.238	8.322		8.624		10.400		-		10.400	Continuing	Continuing	N/A
Remarks															
The JNLW Management Support was previously incorporated into the various cost categories instead of being displayed in the corresponding section of the R-3. The Management Services section of the R-3 now reflects the amounts for civilian salaries and contractor program management. The funding fluctuates across the R-2A categories based on the demand signals of the Services, USSOCOM, and the USCG.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			654.013	27.556		30.533		31.058		-		31.058	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

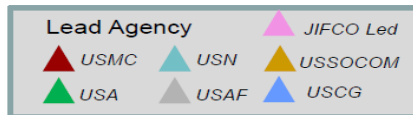
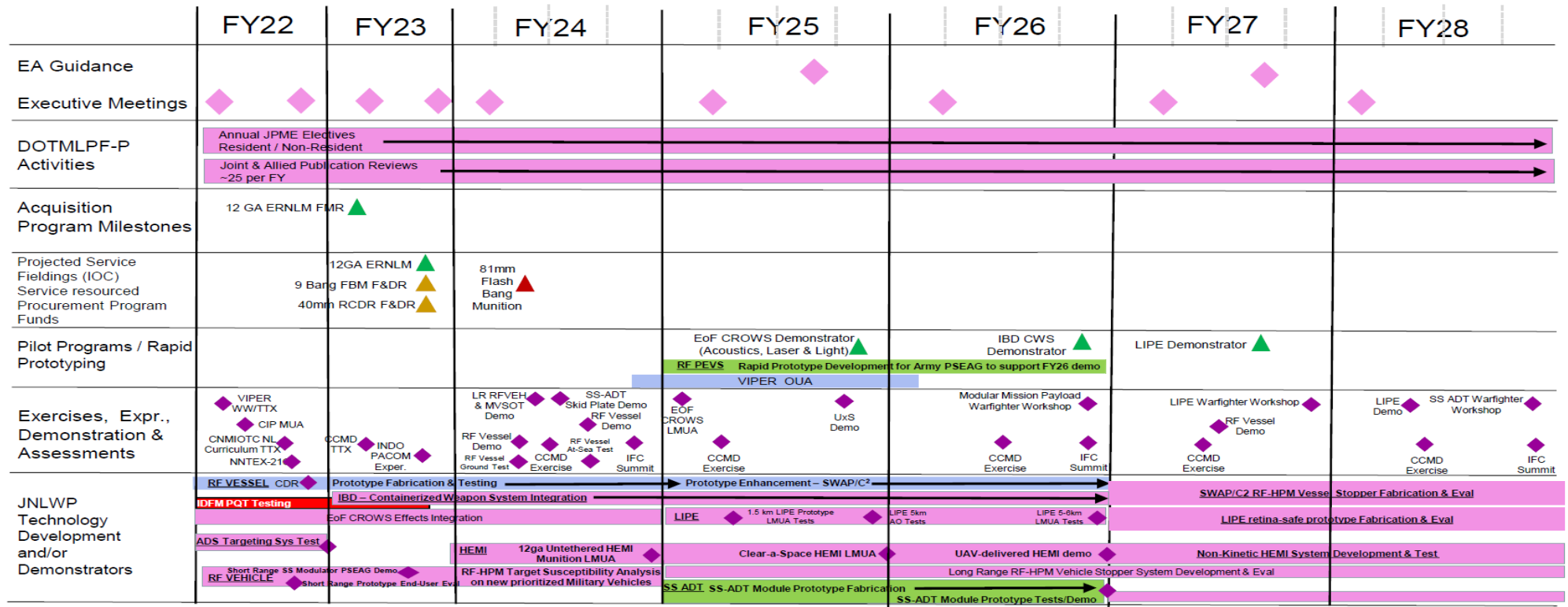
Date: March 2023

Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0603851M / Joint Non-Lethal Weapons
Testing

Project (Number/Name)
2319 / Non-Lethal Weapons

DoD Non-Lethal Weapons Program – Executive Agent (EA) Joint Non-Lethal Weapons Program (JNLWP)



9-Bang – Multi Bang Flashbang Grenade-9 Bang
CCMD – Combatant Command
EoF CROWS – Escalation of Force Common Remotely Operated Weapons Station
ERNLM – Extended Range Non-Lethal Munition
FMB – Flash Bang Munition
HEMI – Human Electro-muscular Incapacitation Technology
HiPR Actv – High Peak-power Radio-Frequency Assessment and Capability
IBD – Integrated Base Defense System
IFC – Intermediate Force Capabilities

JIFCO – Joint Intermediate Force Capabilities Office/DoD NLW Program
LIPE – Laser Induced Plasma Effects
MVSOT – Maritime Vessel Stopping Occlusion Technology
RCDR – Reduced Collateral Damage Round
RF Vehicle – Radio Frequency Vehicle Stopping Technology
RF Vessel – Radio Frequency Vessel Stopping Technology
SS ADT – Solid State Active Denial Technology

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603851M / Joint Non-Lethal Weapons Testing	Project (Number/Name) 2319 / Non-Lethal Weapons	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2319				
RF Vessel - Radio Frequency Vessel Stopping Technology: Critical Design Review	4	2022	4	2022
Counter Materiel: 40mm Door Breach NL Round: F&DR	4	2023	4	2023
12 Gauge Extended Range Non-Lethal (12GA ERNL): IOC	4	2023	4	2023
9 Bang: F&DR	4	2023	4	2023
Radio Frequency Vessel Stopping Technology: Ground Test	2	2024	2	2024
12ga Untethered Human Electro-muscular Incapacitation Technology Munition: Limited User Military Assessment	4	2024	4	2024
Radio Frequency Vessel Stopping Technology: At-Sea Test	4	2024	4	2024
Laser Induced Plasma Effects Prototype: Limited User Military Assessment	2	2025	2	2025

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603860N / JNT Precision Approach & Ldg Sys							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	1,408.671	20.223	18.628	22.590	-	22.590	6.628	6.609	7.132	7.668	Continuing	Continuing
2329: JPALS	1,408.671	20.223	18.628	22.590	-	22.590	6.628	6.609	7.132	7.668	Continuing	Continuing
Program MDAP/MAIS Code: Project MDAP/MAIS Code(s): 238												
A. Mission Description and Budget Item Justification												
A. Mission Description and Budget Item Justification												
The Joint Precision Approach and Landing System (JPALS) is the primary precision approach and landing system for CVN and LHA/D ships to support aircraft without AN/SPN-46 Automatic Carrier Landing Systems (ACLS) capability including F-35B, F-35C, MQ-25A and future platforms. JPALS ship systems are required to provide CVN and LHA/D ships a primary precision approach capability during night and instrument flight conditions, including coupled approach capability to a hover transition point for LHA/D ships, and coupled approach to the deck (auto-land) capability aboard CVN ships, and contested environments. JPALS also provides the over-the-air inertial alignment capability for CVN and LHA/D ships to support aircraft platforms without Link-4A capability, including F-35, MQ-25A and future platforms. JPALS efforts include addressing broadened CyberSecurity requirements to remain compliant with software CyberSecurity directives and Information Assurance mandates. This budget also ensures required capability improvements to JPALS shipboard systems is accomplished, to ensure the successful integration of Landing Autonomous Navigation Technology for Enhanced Recovery to Navy Ships (LANTERNS). LANTERNS is a technological improvement being researched by Future Naval Capabilities/Advanced Technology Development (PE 0603673N) to ensure the continued development of enhanced, Precise Ship-Relative Navigation (PS-RN) for reliable autonomous ship recovery of Unmanned Aerial Systems (UAS) in all weather, high deck motion environments.												
The FNC research is centered on aircraft systems.												
The JPALS RDT&E supports integration of LANTERNS into the JPALS shipboard systems, delivering lethality through resilient launch and recovery operations in contested environments and during Distributed Maritime Operations.												
JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in high fidelity and realistic operating environments.												

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0603860N / JNT Precision Approach & Ldg Sys			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	22.950	18.628	13.297	-	13.297
Current President's Budget	20.223	18.628	22.590	-	22.590
Total Adjustments	-2.727	0.000	9.293	-	9.293
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.979	0.000			
• SBIR/STTR Transfer	-0.748	0.000			
• Program Adjustments	0.000	0.000	9.088	-	9.088
• Rate/Misc Adjustments	0.000	0.000	0.205	-	0.205
<u>Change Summary Explanation</u>					
Technical: N/A					
Schedule: FY 2024 schedule change due to Air Vehicle delays for MQ-25.					
Financial: FY 2024 funding increase funds JPALS M-Code receiver development which will provide protected JPALS-specific outputs needed to ensure precision navigation, precision coupled approach and landing, and over-the-air inertial alignment services to F-35, MQ-25, and future air platforms.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603860N / JNT Precision Approach & Ldg Sys				Project (Number/Name) 2329 / JPALS			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2329: JPALS	1,408.671	20.223	18.628	22.590	-	22.590	6.628	6.609	7.132	7.668	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 238												
A. Mission Description and Budget Item Justification												
<p>This budget reflects the Department of Defense certified Component Cost Position of the restructured Joint Precision Approach and Landing System (JPALS) program that funds the developmental, testing, and integration activities to implement and field JPALS ship systems that deliver the primary precision approach, landing, on-deck inertial alignment, surveillance, and auto-land capability for current and future low observable manned and unmanned platforms onboard all CVN and LHA/D ships. JPALS provides for development, integration, installation, and test of JPALS on CVN and LHA/D ships in accordance with the Joint Requirements Oversight Council (JROC) March 2016 approved JPALS Capability Development Document (CDD). JPALS Engineering Development Model (EDM) articles have been delivered to support JPALS EMD activities.</p> <p>JPALS EDMs have been installed at shore based test facilities and (temporarily) on CVN and LHA/D ships to support F-35B/C developmental and operational testing and MQ-25A concept refinement, system requirements identification, allocation, surrogate risk reduction, and test. Two JPALS EDMs were procured in FY 2017 to support testing and F-35 shipboard operational deployments. JPALS will continue to invest in software development in direct support of precision approach and auto-land capabilities for the F-35B/C, MQ-25A, and future air platforms. JPALS effort includes addressing broadened CyberSecurity requirements to remain compliant with software CyberSecurity directives and Information Assurance mandates. Remaining costs are associated with the completion of the test and support to fielded EDM units and to develop, test, and transition JPALS to use GPS M-Code. Additionally, costs are to enhance Precision Ship-Relative Navigation (PS-RN) for Navy and Marine Corps unmanned, and potentially manned, platforms, enabling resilient Distributed Maritime Operations (DMO) via the Landing Autonomous Navigation Technology for Enhanced Recovery to Navy Ships (LANTERNS) Future Naval Capabilities (FNC) and other system improvements.</p>												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)							FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	
<p>Title: JPALS Ship Systems and Test</p> <p>Articles:</p> <p>Description: JPALS provides for development, integration, installation, and test of Sea-Based JPALS on CVN and LHA/D ships.</p> <p>FY 2023 Plans: Continue research and evaluation of GPS M-Code for implementation into the JPALS system. Continue analysis of available M-code capable Government off the Shelf (GOTS) receivers and development of JPALS-capable receiver interfaces and output requirements.</p> <p>FY 2024 Base Plans:</p>							13.194	11.105	14.917	0.000	14.917	
							-	-	-	-	-	

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603860N / JNT Precision Approach & Ldg Sys		Project (Number/Name) 2329 / JPALS		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Begin development of M-code capable GOTS receivers and continue development of JPALS-capable receiver interfaces and output requirements. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$3.812M from FY 2023 to FY 2024 is due to initiating the next phase for development of the JPALS M-Code receiver.						
Title: Joint Strike Fighter (JSF) F-35B Marine Corp STOVL and F-35C Navy Carrier Variant Support Articles: Description: Provide technical development, shore based, and ship based support for F-35B and F-35C JPALS Integration and Developmental Test (DT) and Operational Test (OT) events. Provide JPALS system certification and documentation to certify shipboard all weather precision approach capability for F-35 operational test and deployments. FY 2023 Plans: Continue development of JPALS two-way and autoland implementation into F-35 aircraft. FY 2024 Base Plans: Continue support of the JPALS UDB operations for F-35 aircraft. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$.030M from FY 2023 to FY 2024 is due to inflation.		4.264 -	1.500 -	1.530 -	0.000 -	1.530 -
Title: MQ-25 Support Articles: Description: Provide technical support, lab support, requirements identification, allocation and test activities for MQ-25. Support MQ-25 concept refinement, requirements development, integration specifications, and risk reduction activities for JPALS integration. Support MQ-25 concept refinement and JPALS integration and developmental activities.		1.765 -	1.800 -	1.836 -	0.000 -	1.836 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023				
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603860N / JNT Precision Approach & L dg Sys	Project (Number/Name) 2329 / JPALS				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
FY 2023 Plans: Continue JPALS algorithm integration support and testing. Continue preparation of JPALS system integration lab at Patuxent River for MQ-25 shore testing.							
FY 2024 Base Plans: Continue preparation of JPALS system integration lab at Patuxent River for MQ-25 shore-based testing.							
FY 2024 OCO Plans: N/A							
FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$.036M from FY 2023 to FY 2024 is due to inflation.							
Title: Advanced Technology Integration			1.000	4.223	4.307	0.000	4.307
Articles:			1	-	-	-	-
Description: This project provides funding for integrating and transitioning new capabilities into the JPALS ship system requirements.							
FY 2023 Plans: Surrogate aircraft engineering and modification, CVN ship flight test planning and execution, and post test data analysis. The system will be tested at-sea and baselined into the appropriate programs of record.							
FY 2024 Base Plans: Continue surrogate aircraft engineering and modification, CVN ship flight test planning and execution, and post test data analysis. The system will be shore-tested and baselined into the appropriate programs of record.							
FY 2024 OCO Plans: N/A							
FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$.084M is due to inflation.							
Accomplishments/Planned Programs Subtotals			20.223	18.628	22.590	0.000	22.590

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy									Date: March 2023		
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0603860N / JNT Precision Approach & Ldg Sys				Project (Number/Name) 2329 / JPALS			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• OPN/2867: JPALS	35.386	8.186	3.343	-	3.343	11.453	9.759	8.245	4.331	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
<p>Technology Development phase was conducted jointly by NAVAIRSYSCOM (PMA-213), USAF Electronic Systems Command (Global Air) and multiple industry partners. This effort provided the concept of operations, performance specifications and technology readiness levels necessary to provide the foundation from which to launch the Increment 1 System Development and Demonstration (SDD) phase development. Joint Precision Approach and Landing System (JPALS) reached MS-B on 14 July 2008 and the SDD phase development contract was awarded on 17 July 2008. Tasking consisted of sea-based JPALS, related ship and airborne reference systems, end-to-end software algorithms, necessary ship installation hardware, test equipment, system simulation software, and other RDT&E deliverable products. The SDD contract was awarded after full and open competition. JPALS is being developed by the Navy with an open system architecture in order to facilitate the compatible integration of many different aircraft and avionics architectures. JPALS provides for development, integration, installation, and test of Sea-Based JPALS to meet Initial Operation Capability of CVN and LHA/D ships in accordance with the JPALS Capability Development Document (CDD). Additionally, this requirement provides critical enabling technology for Joint Strike Fighter (JSF) F-35B Marine Corps Short Take-Off and Vertical Landing (STOVL) and F-35C Navy Carrier Variant, ship-based MQ-25A, and future Navy and Marine Corps air platforms.</p>											
<p>As a result of the DON Resource and Requirements Review Board approved PALC Roadmap, the JPALS production phase was deferred to include design improvements to provide manned and unmanned aircraft with autoland capabilities. The current Engineering and Manufacturing Development (EMD) contract was modified in FY14 to add detailed requirements and design trade studies to identify specific system design improvements. An extension for pre-Milestone B efforts was awarded in fourth quarter FY15.</p>											
<p>A Development RFP Release Decision Point (DRRDP) Defense Acquisition Board (DAB) was completed and the RFP for JPALS EMD 16 was released on 24 November 2015. A Milestone B (MS B) DAB was completed 02 June 2016. The MS B Acquisition Decision Memorandum (ADM) was approved 27 June 2016, which granted entry into the EMD phase for the restructured JPALS program and officially completed all actions required to exit Nunn-McCurdy. JPALS now has an approved Acquisition Program Baseline (APB) and has been designated an Acquisition Category (ACAT) 1C program. Sole Source contract was awarded to Raytheon in fourth quarter FY 2016. Completed Milestone C in April 2019.</p>											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603860N / JNT Precision Approach & Ldg Sys				Project (Number/Name) 2329 / JPALS					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Ship Integration	WR	NAWCAD : Pax River, MD	85.018	0.000		0.000		0.000		-		0.000	0.000	85.018	-
Primary Hardware Development - EMD Phase I	C/CPIF	Raytheon : Fullerton, CA	410.181	0.000		0.000		0.000		-		0.000	0.000	410.181	410.181
Primary Hardware Development - New EMD Contract	C/CPIF	Raytheon : Fullerton, CA	250.646	14.561	Nov 2021	0.000		0.000		-		0.000	0.000	265.207	268.895
JPALS Modifications for ARC-210	C/CPFF	RCI : Cedar Rapids, IA	8.603	0.000		0.000		0.000		-		0.000	0.758	9.361	10.119
Risk Reduction for Auto-land - FFRDC Support	FFRDC	JHU : Laurel, MD	0.493	0.000		0.000		0.000		-		0.000	0.000	0.493	-
Primary Hardware Development - M-Code	TBD	Various : Various	0.000	0.000		8.689	Nov 2022	13.333	Nov 2023	-		13.333	0.000	22.022	-
Prior Year Prod Dev no longer funded in the FYDP	TBD	Various : Various	249.870	0.000		0.000		0.000		-		0.000	0.000	249.870	-
Subtotal			1,004.811	14.561		8.689		13.333		-		13.333	0.758	1,042.152	N/A
Remarks															
Increase in Primary Hardware Development from FY 2023 to FY 2024 is due to the development of M-code capable GOTS receivers and development of JPALS-capable receiver interfaces and output requirements.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering Support - JPALS	WR	NAWCAD : Pax River, MD	221.218	2.967	Nov 2021	3.948	Nov 2022	3.410	Nov 2023	-		3.410	Continuing	Continuing	Continuing
Integrated Logistics Support	WR	NAWCAD : Pax River, MD	22.779	0.000		0.000		0.000		-		0.000	0.000	22.779	-
Systems Engineering Suppt - Advanced Technologies	TBD	Various : Various	0.000	1.000	Nov 2021	3.951	Nov 2022	3.898	Nov 2023	-		3.898	0.000	8.849	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603860N / JNT Precision Approach & Ldg Sys				Project (Number/Name) 2329 / JPALS					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Support Costs non longer funded in FYDP	Various	Various : Various	21.514	0.000		0.000		0.000		-		0.000	0.000	21.514	-
Subtotal			265.511	3.967		7.899		7.308		-		7.308	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NAWCAD : Pax River, MD	76.770	0.000		0.000		0.000		-		0.000	0.000	76.770	-
Prior Year Operational Test & Evaluation Not Funded FYDP (PYOT&E)	WR	COMOPTEVFOR : Norfolk, VA	6.703	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	WR	NAWCAD : Pax River, MD	8.633	0.716	Nov 2021	1.413	Nov 2022	1.441	Nov 2023	-		1.441	Continuing	Continuing	Continuing
Subtotal			92.106	0.716		1.413		1.441		-		1.441	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	WR	NAWCAD : Pax River, MD	30.618	0.837	Nov 2021	0.617	Nov 2022	0.503	Nov 2023	-		0.503	0.000	32.575	-
PM Support - MSS	C/CPFF	Amelex : Pax River, MD	10.753	0.000		0.000		0.000		-		0.000	0.000	10.753	-
PM Support - MSS	C/CPFF	Avian : Pax River, MD	1.592	0.000		0.000		0.000		-		0.000	0.000	1.592	-
PM Support - MSS	C/CPFF	SAIC : Pax River, MD	2.487	0.000		0.000		0.000		-		0.000	0.000	2.487	-
PM Support - MSS	C/CPFF	DDG : Pax River, MD	0.263	0.127	Nov 2021	0.000		0.000		-		0.000	0.000	0.390	-

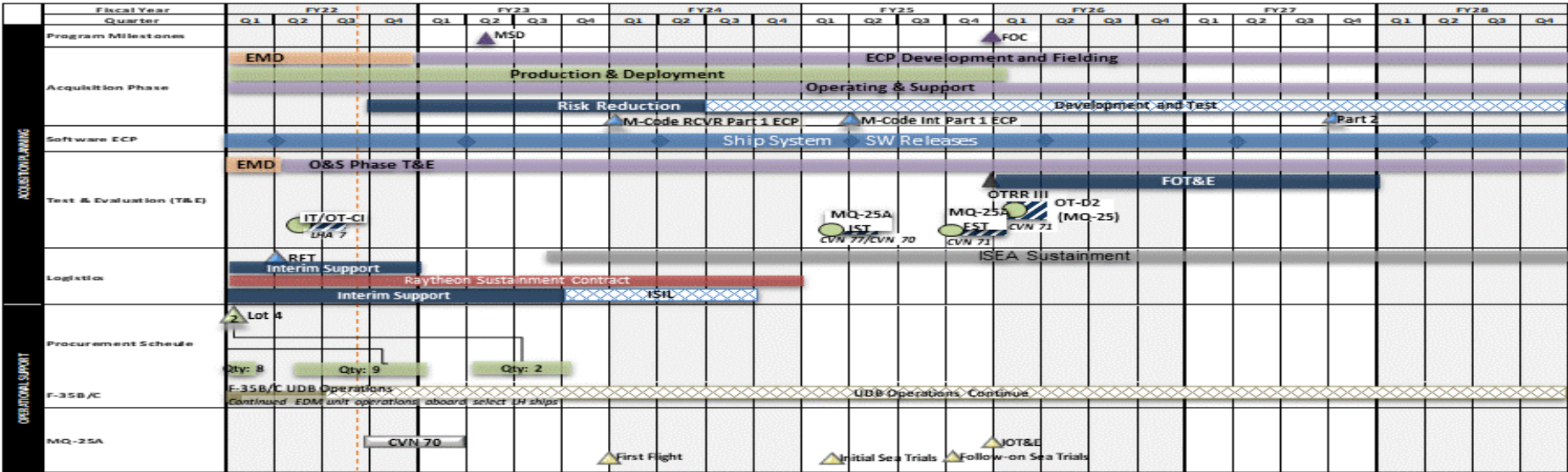
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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603860N / JNT Precision Approach & Ldg Sys						Project (Number/Name) 2329 / JPALS			
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	WR	NAVAIR : Pax River, MD	0.530	0.015	Nov 2021	0.010	Nov 2022	0.005	Nov 2023	-		0.005	0.000	0.560	-
Subtotal			46.243	0.979		0.627		0.508		-		0.508	0.000	48.357	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			1,408.671	20.223		18.628		22.590		-		22.590	Continuing	Continuing	N/A
Remarks															

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603860N / JNT Precision Approach & Ldg Sys	Project (Number/Name) 2329 / JPALS



JPALS Program Schedule



Notes:
M-Code schedule based on notional planning package

- Legend:
- Critical Path to JPALS IOC
 - EDM Unit
 - Production Unit
 - System Build 4.x.y
 - Lot Buys
 - Unit Delivery
 - Projected Test/Cert

Revision Date: May 2022

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

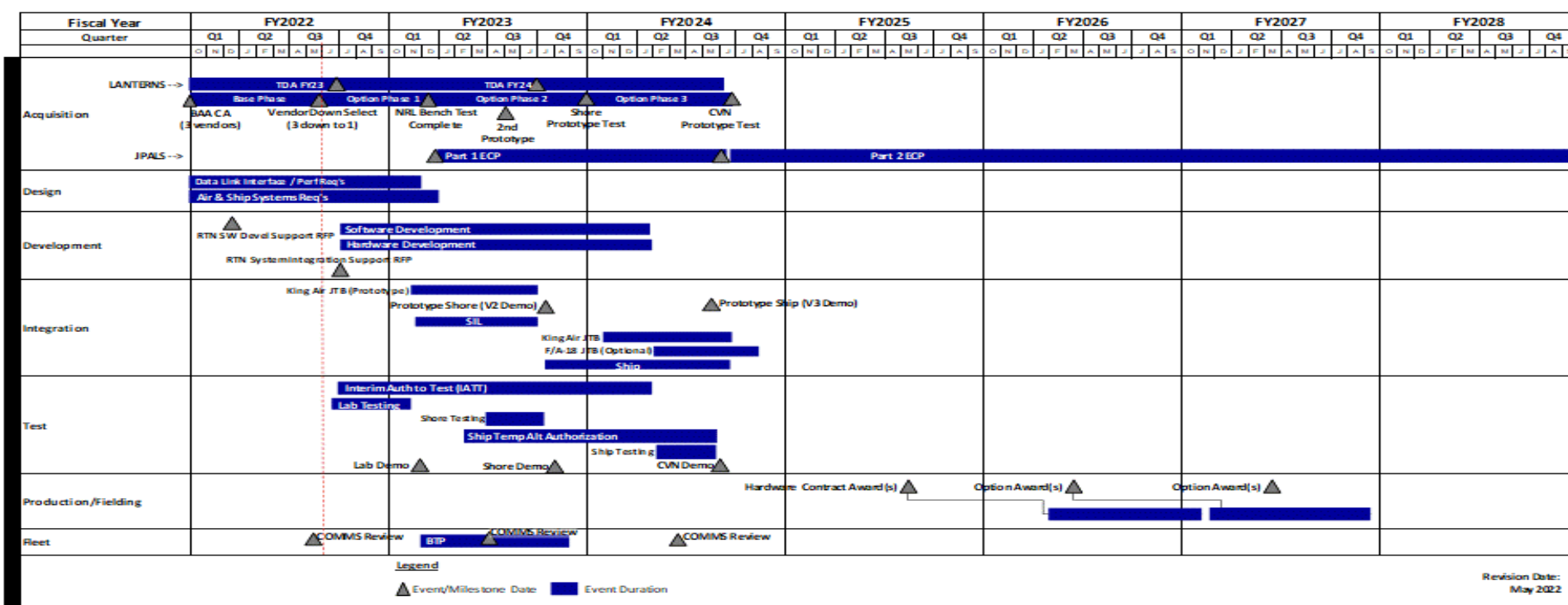
PE 0603860N / JNT Precision Approach & Ldg Sys

Project (Number/Name)

2329 / JPALS



Advanced Technology Integration



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603860N / JNT Precision Approach & L dg Sys	Project (Number/Name) 2329 / JPALS	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
JPALS				
Acquisition Milestones: MSD	2	2023	2	2023
Acquisition Milestones: FOC	1	2026	1	2026
Systems Development: Engineering and Manufacturing Development	1	2022	4	2022
Test & Evaluation: JPALS Operational Test Readiness Review (OTRR) III	1	2026	1	2026
Test & Evaluation: JPALS Follow-on Operational Test and Evaluation	1	2026	4	2027
Advanced Technology Integration				
Acquisition Milestones: Demo	3	2024	3	2024
Systems Development: Hardware/Software Development	3	2022	2	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	447.324	80.055	65.080	52.129	-	52.129	59.443	38.912	36.816	37.168	Continuing	Continuing
2731: High Energy Laser Counter ASCM Project (HELCAP)	36.327	25.185	6.598	6.194	-	6.194	4.150	4.047	3.388	3.458	Continuing	Continuing
3402: Surface Navy Laser Weapon System (SNLWS)	262.016	39.249	19.124	20.439	-	20.439	32.456	32.300	31.406	31.813	Continuing	Continuing
5898: Directed Energy Components for High Energy Lasers	0.000	0.000	14.040	4.825	-	4.825	0.000	0.000	0.000	0.000	0.000	18.865
9823: Lasers for Navy applicat	148.981	15.621	25.318	20.671	-	20.671	22.837	2.565	2.022	1.897	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element will transition Directed Energy and Electric Weapon Systems (DE&EWS) technology from Science and Technology (S&T) research to the Technology Maturation and Risk Reduction phase, ultimately leading to acquisition initiation for the Surface/Subsurface Navy.

DE&EWS consists of multiple breakthrough technologies including: laser weapons that provide for speed-of-light engagements at tactically significant ranges resulting in savings realized by minimizing the use of defensive missiles and projectiles; electromagnetic launch of projectiles that will significantly increase firing ranges imposing greater cost to adversaries of ballistic and air defense missile engagements; enhance the land attack mission; and fielding of high power radio frequency systems for non-kinetic electronic attack and active denial technology, allowing for non-lethal determination of threat intent beyond small arms fire ranges.

Development of DE&EWS includes: Weapons Grade High Energy Lasers, Electromagnetic Railgun (EMRG) Weapon Systems, High Power Radio Frequency Weapon/Sensor Systems, and other systems/capabilities.

Project 2731 - High Energy Laser Counter ASCM Project (HELCAP): Defeating Anti-Ship Cruise Missiles (ASCMs) with a laser weapon system presents several technical challenges (e.g. high atmospheric turbulence, target acquisition and identification, target tracking, aim point maintenance, automatic aim point placement, jitter control). The High Energy Laser Counter ASCM Project (HELCAP) will assess, develop, experiment, and demonstrate the various laser weapon system technologies and methods of implementation (e.g. laser sources, mission analysis, lethality, advanced beam control with atmospheric mitigation, target and tracking sensors, control systems) required to defeat ASCMs in a crossing engagement.

The FY24 budget request supports ASCM defeat analysis and assessments including lethality, engagement modeling, atmospheric propagation characterization and beam control, as well as modeling and simulation and limited maritime experimentation to map results from the Beam Control Testbed Tracker and Verification demonstration to a maritime environment.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>
<p>Project 3402 - Surface Navy Laser Weapon System (SNLWS): Program supports the National Defense Strategy of building a more lethal force by leveraging mature technology to deliver proven laser weapon capability to the Fleet as part of the Navy Laser Family of Systems (NLFoS) initiative with the objective of providing the fleet with near-term laser weapon capabilities. Additionally, accelerated learning through incorporation of laser weapon Concept of Operations (CONOPs), employment, and maintenance will enable the rapid development and integration of these capabilities with the Navys existing weapon systems. This NLFoS initiative will also develop and validate warfighting requirements for laser weapons to address a variety of threats and to mature technologies and system integration readiness. High Energy Laser with Integrated Optical-Dazzler System (HELIOS) provides a low cost-per-shot capability to address Anti-Surface Warfare and Counter-Intelligence, Surveillance and Reconnaissance (C-ISR) gaps with the ability to dazzle and destroy Unmanned Aerial Systems (UAS) and defeat Fast Inshore Attack Craft (FIAC) while integrated into the AEGIS Combat System on a Flt IIA Destroyer. SNLWS provides industry-developed and government integrated capability to the Fleet in as short a timeframe as possible, thereby addressing the National Defense Strategy direction to foster a culture of innovation. SNLWS includes the development of a laser weapon system in the 60 kW or higher class. Competition was utilized for system development and production efforts. SNLWS leverages mature technology that will deliver a mature laser weapon system capability to the Fleet. SNLWS development leverages the Laser Weapon System (LaWS)/Solid State Laser Quick Reaction Capability (SSL QRC) and Solid State Laser Technology Maturation (SSL TM)/Laser Weapon System Demonstrator (LWSD) efforts.</p> <p>The FY24 budget request supports the operation, testing and sustainment of Mk 5 Mod 0 HELIOS on DDG 88 through technical in-service engineering agent and contractor maintenance and repair support as necessary, to include procurement and/or production of repair parts, routine cyber security and software upgrade installment, software troubleshooting through remote labs, modifications of hardware components, test and evaluation of requirements and updates to training materials and associated deliverables for any changes identified during HELIOS employment.</p> <p>Project 5898 - Directed Energy Components for High Energy Lasers: Supports Industrial Base Analysis and Sustainment (IBAS) program efforts for the improvement of the production capability of the industrial base in order to produce Laser Weapon Beam Director (LWBD) components and sub-systems; reduces production lead times of Laser Weapon System Optics; improves quality and reduces production times of Fast Steering Mirror (FSM) and deformable mirrors.</p> <p>The FY24 budget request supports the completion of the development of the production capability enhancement of the Laser Weapon Beam Director (LWBD) components and sub-systems, coating chambers for laser weapon optics, Fast Steering Mirrors (FSM) and deformable mirrors. This investment is a risk mitigation for manufacturing capability enhancements through the qualification and validation of production equipment and process improvements.</p> <p>Project 9823 - Lasers for Navy Applications: Optical Dazzler Interdictor Navy (ODIN) development provides near-term, directed energy, shipboard Counter-Intelligence, Surveillance, and Reconnaissance (C-ISR) capabilities to dazzle Unmanned Aerial Systems (UASs) and other platforms that address urgent operational needs of the Fleet. FY 2018 was the first year of funding which supports the design, development, procurement and installation of 8 ODIN standalone units over the FYDP, for deployment on DDG 51 Flt IIA surface combatants. The program supports the non-recurring engineering, development, procurement of long lead material, assembly and checkout, system certification, platform integration/installation and sustainment for these ODIN standalone units.</p> <p>The FY24 budget request supports the continuation of the development of the technology refresh package and subsystem maturation efforts to improve the reliability, capability and operability of ODIN, and manpower to conduct modeling & simulation of ODIN engagements.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0603925N I Directed Energy and Electric Weapon System			
Project 9999 (PU C516) - Congressional Add - High Energy Laser (HEL) Weapon System for Counter-Unmanned Ariel System (C-UAS) Area defense is a Congressionally directed effort to develop/build a minimized footprint, laser-agonistic beam director and beam control system (M-BD/BCS) to support Commercial Off The Shelf (COTS) lasers >10KW for possible application to Joint Light Tactical Vehicle (JLTV) sized vehicles.					
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	81.803	65.080	63.719	-	63.719
Current President's Budget	80.055	65.080	52.129	-	52.129
Total Adjustments	-1.748	0.000	-11.590	-	-11.590
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.748	0.000			
• Program Adjustments	0.000	0.000	-12.467	-	-12.467
• Rate/Misc Adjustments	0.000	0.000	0.877	-	0.877

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System				Project (Number/Name) 2731 / High Energy Laser Counter ASCM Project (HELCAP)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2731: High Energy Laser Counter ASCM Project (HELCAP)	36.327	25.185	6.598	6.194	-	6.194	4.150	4.047	3.388	3.458	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Due to technology maturation, a portion of HELCAP program efforts now fall into BA04.

A. Mission Description and Budget Item Justification

The High Energy Laser Counter ASCM Project (HELCAP) will expedite the development, experimentation, integration and demonstration of critical technologies to defeat crossing Anti-Ship Cruise Missiles (ASCM) by addressing the remaining technical challenges, e.g.: atmospheric turbulence, automatic target identification and aim point selection, precision target tracking with low jitter in high clutter conditions, advanced beam control, and higher power HEL development. HELCAP will assess, develop, experiment, and demonstrate the various laser weapon system technologies and methods of implementation required to defeat ASCMs in a crossing engagement.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: High Energy Laser Counter ASCM Project (HELCAP)	25.185	6.598	6.194	0.000	6.194
Articles:	-	-	-	-	-
Description: HELCAP activities under this project (0603925N) include system level testing and verification of the Laser Weapon Testbed (LWT) in a simulated (land based) and maritime environment. Transition of technologies developed under (0603801N) will be integrated into the LWT system. The Beam Control Testbed subsystem will be combined with a HEL source, power/thermal, and weapon control to demonstrate the LWT system level maturity. This leveraged knowledge and new HELCAP technical solutions to the C-ASCM problem will enable a fully informed decision to rapidly field an integrated, fleet ready, HEL Weapon.					
FY 2023 Plans: Continue: - ASCM defeat analysis and evaluation including lethality, engagement modeling, atmospheric propagation characterization, and beam control. - Laser/materiel component interaction testing and support beam control tracker and adaptive optics verification experimentation. Complete:					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023							
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>		Project (Number/Name) 2731 / <i>High Energy Laser Counter ASCM Project (HELCAP)</i>							
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)											
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total						
N/A											
FY 2023 to FY 2024 Increase/Decrease Statement: FY 2023 to FY 2024 decrease supports continued experimentation with completed system and transportation of the system from White Sands Missile Range (WSMR) to the maritime environment.											
Accomplishments/Planned Programs Subtotals	25.185	6.598	6.194	0.000	6.194						
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTE/0603801N/2731: <i>High Energy Laser Counter ASCM Project</i>	13.541	22.460	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	63.800
Remarks											
D. Acquisition Strategy The HELCAP is an initiative that provides a flexible prototype system for government experimentation and demonstration of a high-energy laser system capable of defeating an anti- ship cruise missile. Key elements of the prototype system include the beam control testbed, 300 kW+ class laser source, prototype control system, and auxiliary prime power and cooling. The industry provider of the beam control testbed (developed under PE 0603801N) was selected through a competitive process and is being designed to accept technology insertion from other industry providers. The 300+ kW class laser source will be acquired by selecting one of the laser sources being developed under an OSD laser scaling initiative and adapting it for transport and interface with the other elements of the prototype system. The Naval Surface Warfare Center Dahlgren (NSWCDD) will design and fabricate the control system and auxiliary prime power and cooling systems. NSWCDD government and contractor engineers will then integrate all above elements that make up the prototype and auxiliary systems and perform FY22-23 counter ASCM detect to defeat experimentation and demonstrations at government test sites.											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System				Project (Number/Name) 2731 / High Energy Laser Counter ASCM Project (HELCAP)					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prototype System Controls, Target Tracking, and Deconfliction (Government team)	WR	NSWC Dahlgren : Dahlgren VA	5.843	3.561	Oct 2021	2.298	Oct 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Prototype System Controls, Target Tracking, and Deconfliction (Contractor Team)	C/CPFF	Booz Allen Hamilton : Dahlgren VA	3.006	0.810	Nov 2021	0.250	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
HELCAP Mission Analysis	WR	NSWC Dahlgren : Dahlgren VA	1.966	0.812	Oct 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
HELCAP Mission Analysis	C/CPFF	JHU/APL : Laurel MD	0.966	1.428	Nov 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Design government owned interfaces between the OSD Laser Source and Prototype System	WR	NSWC Dahlgren : Dahlgren VA	0.876	0.780	Oct 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Adapt OSD Laser Source for Transport and Interface with Prototype System	C/CPFF	TBD : Not Specified	1.980	1.787	Mar 2022	1.000	Mar 2023	0.000		-		0.000	Continuing	Continuing	Continuing
Prototype and Support System Integration	WR	NSWC Dahlgren : Dahlgren VA	4.299	2.040	Oct 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Procure and Assemble Prototype System Power and Misc Hardware	C/CPFF	Nutronics : Longmont, CO	5.796	1.622	Mar 2022	1.750	Mar 2023	0.000		-		0.000	Continuing	Continuing	Continuing
Modeling and Simulations	WR	TBD : Not Specified	0.000	0.000		0.500	Oct 2022	0.000		-		0.000	0.000	0.500	-
Subtotal			24.732	12.840		5.798		0.000		-		0.000	Continuing	Continuing	N/A
Remarks FY22 funding was decreased to accommodate the SBIR Assessment. FY23 to FY24 decrease reflects completion of Product Development.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System						Project (Number/Name) 2731 / High Energy Laser Counter ASCM Project (HELCAP)			
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
HELCAP Systems Engineering, Safety, Program Management (Government team)	WR	NSWC Dahlgren : Dahlgren VA	4.390	3.908	Oct 2021	0.000		0.500	Oct 2023	-		0.500	Continuing	Continuing	Continuing
HELCAP Systems Engineering, Safety, Program Management (Contractor team)	C/CPFF	Multiple : Dahlgren VA	2.802	0.140	Nov 2021	0.000		0.500	Nov 2023	-		0.500	Continuing	Continuing	Continuing
Subtotal			7.192	4.048		0.000		1.000		-		1.000	Continuing	Continuing	N/A
Remarks FY23 to FY24 increase supports gov't and contractor efforts.															
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC Port Hueneme/Point Mugu/Dahlgren : Port Hueneme CA, Point Mugu , CA & Dahlgren, VA	1.255	1.772	Oct 2021	0.500	Oct 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	C/CPFF	White Sands Missile Range, & Point Mugu Test Range : White Sands NM & San Nicholas Island, CA	1.449	1.000	Mar 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC Dahlgren : Dahlgren VA	0.966	2.550	Jul 2022	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	C/CPFF	TBD : TBD	0.000	2.400	Mar 2022	0.000		0.684	Oct 2023	-		0.684	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System				Project (Number/Name) 2731 / High Energy Laser Counter ASCM Project (HELCAP)					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NSWC Port Hueneme, NSWC Dahlgren, NAWC WD : Port Hueneme, CA; NSWC Dahlgren, Point Mugu, CA	0.000	0.000		0.000		2.055	Oct 2023	-		2.055	0.000	2.055	-
Developmental Test & Evaluation (DT&E)	C/CPFF	White Sands Missile Range, NAWC WD & San Nicholas : White Sands, NM, San Nicholas Island CA	0.000	0.000		0.000		2.255	Oct 2023	-		2.255	0.000	2.255	-
Subtotal			3.670	7.722		0.500		4.994		-		4.994	Continuing	Continuing	N/A
Remarks FY23 to FY24 increase supports testing in FY24.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
HELCAP Program Management /Engineering Support	C/CPFF	Bowhead : Dahlgren, VA	0.733	0.575	Nov 2021	0.300	Nov 2022	0.200	Oct 2023	-		0.200	Continuing	Continuing	Continuing
Subtotal			0.733	0.575		0.300		0.200		-		0.200	Continuing	Continuing	N/A
Remarks FY23 to FY24 decrease reflects a decrease in management support costs.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			36.327	25.185		6.598		6.194		-		6.194	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy							Date: March 2023			
Appropriation/Budget Activity 1319 / 4			R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System			Project (Number/Name) 2731 / High Energy Laser Counter ASCM Project (HELCAP)				
	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract	
Remarks										

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603925N / Directed Energy and Electric Weapon System

Project (Number/Name)

2731 / High Energy Laser Counter ASCM Project (HELCAP)

High Energy Laser Counter ASCM Project (HELCAP)	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Beam Control Design and Fabricate																												
Prototype Weapon Control Design and Fabricate																												
Adapt OSD Laser Source for Transport and Interface with Prototype System																												
Prime Power and Cooling Design and Fabricate																												
Demo 1 Adaptive Optics and Tracking Performance system integration																												
Mission Analysis																												
ASCM detect to defeat experimentation and demonstration planning																												
ASCM detect to defeat experimentation and demo test site assets and preparation																												
ASCM detect to defeat experimentation - beam control tracker and adaptive optics verification																												
ASCM detect to defeat experimentation - system integration testing																												
ASCM detect to demonstration -defeat of surrogate ASCM in a crossing engagement																												
ASCM detect to defeat demonstration post-test documentation																												

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PE 0603925N: *Directed Energy and Electric Weapon Syst...*
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Project (Number/Name)	Start Date	End Date	Status	Manager	Budget (USD)	Actual Cost (USD)	Progress (%)	Risk Level	Notes
101/Alpha	2023-01-15	2023-03-31	Completed	J. Doe	120,000	118,500	100	Low	Exceeded budget by 1.25%
102/Beta	2023-02-01	2023-05-15	In Progress	A. Smith	250,000	180,000	72	Medium	Minor delays in procurement
103/Gamma	2023-03-10	2023-06-30	On Hold	M. Chen	80,000	0	0	High	Waiting for client approval
104/Delta	2023-04-01	2023-07-31	Planned	S. Kim	150,000	0	0	Medium	Initial planning phase
105/Epsilon	2023-05-01	2023-08-31	Not Started	L. Garcia	90,000	0	0	Low	Resource allocation pending
106/Zeta	2023-06-01	2023-09-30	On Hold	K. Lee	110,000	0	0	Medium	Scope creep concerns
107/Eta	2023-07-01	2023-10-31	Planned	H. Patel	130,000	0	0	Medium	Vendor selection in progress
108/Theta	2023-08-01	2023-11-30	Not Started	B. Wong	70,000	0	0	Low	Initial meeting scheduled
109/Iota	2023-09-01	2023-12-31	Planned	D. Brown	100,000	0	0	Medium	Contract review ongoing
110/Kappa	2023-10-01	2024-01-31	Not Started	F. Green	140,000	0	0	Medium	Team formation complete

2731 I High Energy Laser Counter ASCM
Project (HELCAP)

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0603925N / Directed Energy and Electric Weapon System

Project (Number/Name)

2731 / High Energy Laser Counter ASCM Project (HELCAP)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
High Energy Laser Counter ASCM Project (HELCAP)				
Beam Control Design and Fabricate: HELCAP: Beam Control Design and Fabricate	1	2022	1	2024
Prototype Weapon Control Design and Fabricate: HELCAP: Prototype Weapon Control Design and Fabricate	1	2022	2	2023
Adapt OSD Laser Source for Transport and Interface with Prototype System: HELCAP: Adapt OSD Laser Source for Transport and Interface with Prototype System	3	2022	1	2024
Prime Power and Cooling Design and Fabricate: HELCAP: Prime Power and Cooling Design and Fabricate	1	2022	1	2024
Demo 1 Adaptive Optics and Tracking Performance system integration: Demo 1 Adaptive Optics and Tracking Performance system integration (beam ctrl, prototype weapon ctrl, test support)	1	2022	1	2024
Mission Analysis: HELCAP: Mission Analysis	1	2022	4	2024
ASCM detect to defeat experimentation and demonstration planning: HELCAP: ASCM detect to defeat experimentation and demonstration planning	1	2022	3	2024
ASCM detect to defeat experimentation and demo test site assets and preparation: HELCAP: ASCM detect to defeat experimentation and demo test site assets and preparation	3	2022	3	2024
ASCM detect to defeat experimentation - beam control tracker and adaptive optics verification: HELCAP: ASCM detect to defeat experimentation - beam control tracker and adaptive optics verification	1	2022	3	2024
ASCM detect to defeat experimentation - system integration testing: HELCAP: ASCM detect to defeat experimentation - system integration testing	4	2022	4	2024
ASCM detect to demonstration -defeat of surrogate ASCM in a crossing engagement: HELCAP: ASCM detect to defeat demo -defeat of static and dynamic ground targets and low-cost unmanned aerial targets	2	2023	4	2024

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System		Project (Number/Name) 2731 / High Energy Laser Counter ASCM Project (HELCAP)	
	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
ASCM detect to defeat demonstration post-test documentation: Limited maritime tracking and adaptive optics performance experimentation	1	2024	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System				Project (Number/Name) 3402 / Surface Navy Laser Weapon System (SNLWS)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3402: Surface Navy Laser Weapon System (SNLWS)	262.016	39.249	19.124	20.439	-	20.439	32.456	32.300	31.406	31.813	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 3402 - Surface Navy Laser Weapon System (SNLWS): Program supports the National Defense Strategy of building a more lethal force by leveraging mature technology to deliver proven laser weapon capability to the Fleet as part of the Navy Laser Family of Systems (NLFoS) initiative with the objective of providing the fleet with near-term laser weapon capabilities. Additionally, accelerated learning through incorporation of laser weapon Concept of Operations (CONOPs), employment, and maintenance will enable the rapid development and integration of these capabilities with the Navy's existing weapon systems. This NLFoS initiative will also develop and validate warfighting requirements for laser weapons to address a variety of threats and to mature technologies and system integration readiness. HELIOS provides a low cost-per-shot capability to address Anti-Surface Warfare and Counter-Intelligence, Surveillance and Reconnaissance (C-ISR) gaps with the ability to dazzle and destroy Unmanned Aerial Systems (UAS) and defeat Fast Inshore Attack Craft (FIAC) while integrated into the AEGIS Combat System on a Flt IIA Destroyer. SNLWS provides industry-developed and government integrated capability to the Fleet in as short a timeframe as possible, thereby addressing the National Defense Strategy direction to foster a culture of innovation. SNLWS includes the development of a laser weapon system in the 60 kW or higher class. Competition was utilized for system development and production efforts. SNLWS leverages mature technology that will deliver a mature laser weapon system capability to the Fleet. SNLWS development leverages the Laser Weapon System (LaWS)/Solid State Laser Quick Reaction Capability (SSL QRC) and Solid State Laser Technology Maturation (SSL TM)/Laser Weapon System Demonstrator (LWSD) efforts.

The FY 2024 budget request supports the operation, test and sustainment of Mk 5 Mod 0 HELIOS on DDG 88 through technical in-service engineering agent and contractor maintenance and repair support as necessary, to include procurement and/or production of repair parts, routine cyber security and software upgrade installment, software troubleshooting through remote labs, modifications of hardware components, test and evaluation of requirements and updates to training materials and associated deliverables for any changes identified during HELIOS employment.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: SNLWS Prime Contractor Efforts	21.605	6.074	5.969	0.000	5.969
Articles:	-	-	-	-	-
FY 2023 Plans: - Continue to provide programmatic and engineering support to Integrated Product Teams (IPTs) and Working Groups (WGs). - Continue to provide shipboard technical support. - Continue and complete shipboard test and checkout support.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System		Project (Number/Name) 3402 / Surface Navy Laser Weapon System (SNLWS)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div>- Continue to provide software and hardware sustainment support and procure materials.</div> <div>- Continue Alteration Installation Team (AIT) support.</div> <div>- Support the initiation of Counter Anti-Ship Cruise Missile (C-ASCM) testing.</div> <div>FY 2024 Base Plans:</div> <div>- Continue to provide programmatic and engineering support to Integrated Product Teams (IPTs) and Working Groups (WGs).</div> <div>- Continue to provide shipboard technical support by monitoring system throughout operation as the Original Equipment Manufacturer (OEM).</div> <div>- Continue to provide software and hardware sustainment support and procure materials.</div> <div>- Provide information, inspection, and support for subsystem maturation efforts, analysis and documentation.</div> <div>- Support the conduct of the Counter Anti-Ship Cruise Missile (C-ASCM) post testing analysis.</div> <div>FY 2024 OCO Plans:</div> <div>N/A</div> <div>FY 2023 to FY 2024 Increase/Decrease Statement:</div> <div>The decrease in prime contractor funding from FY23 to FY24 is a result of the majority of the testing being completed in FY23.</div>						
<div>Title: SNLWS Government and Support Engineering Services</div> <div>Articles:</div> <div>FY 2023 Plans:</div> <div>- Continue to provide systems engineering and sustainment support.</div> <div>- Continue to provide shipboard technical support.</div> <div>- Commence underway testing and engineering support.</div> <div>- Commence sustainment support and procure materials.</div> <div>- Deliver updated training documentation to the ship.</div> <div>- Initiate Counter Anti-Ship Cruise Missile (C-ASCM) testing.</div> <div>FY 2024 Base Plans:</div> <div>- Continue to provide systems engineering and sustainment support.</div> <div>- Continue to provide shipboard technical support by monitoring system throughout operation as the In-Service Engineering Agent (ISEA).</div>		17.644 -	13.050 -	14.470 -	0.000 -	14.470 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>		Project (Number/Name) 3402 / <i>Surface Navy Laser Weapon System (SNLWS)</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<ul style="list-style-type: none"> - Continue underway testing and engineering support, utilizing ship test events and windows of opportunity to verify unmet requirements through at sea testing and evaluation. - Continue sustainment support and procure materials. - Provide training updates, maintenance requirements updates and shipboard allowance documentation. - Conduct Counter Anti-Ship Cruise Missile (C-ASCM) post testing analysis. - Provide programmatic and engineering support to Integrated Product Teams (IPTs) and Working Groups (WGs). - Provide software and cybersecurity support. - Create technical refresh package to include material and assembly drawings. <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The increase in government funding from FY23 to FY24 is for operational support, at-sea testing, and training and development of Knowledge, Skills and Abilities (KSAs) and Tactics, Techniques and Procedures (TTPs) for the Mk 5 Mod 0 HELIOS on DDG 88.</p>						
Accomplishments/Planned Programs Subtotals		39.249	19.124	20.439	0.000	20.439
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy The acquisition strategy permits accelerated fielding of laser weapon systems in the Fleet and provides a demand signal for the industrial base to expand the capacity to develop and manufacture this advanced technology. The acquisition strategy consists of the baseline development and production of one unit followed by options to acquire system quantities at firm fixed price that will address operational needs of the Fleet in the requisite timeframe to offset future threats and maintain technological superiority over potential adversaries. SNLWS provides for industry-developed and government integrated capability to the Fleet in as short a timeframe as possible, thereby addressing the National Defense Strategy direction to foster a culture of affordability. SNLWS includes the development of an advanced laser weapon system in the 60 kW or higher class. Competition was utilized for system development and production efforts.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System						Project (Number/Name) 3402 / Surface Navy Laser Weapon System (SNLWS)			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SNLWS Development	C/CPIF	Lockheed Martin Aculight : Bothell, WA	149.385	0.000		0.000		0.000		-		0.000	0.000	149.385	-
Subtotal			149.385	0.000		0.000		0.000		-		0.000	0.000	149.385	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SNLWS Systems Engineering, Program Management, GFE/GFI, Tech Assist, ILS	WR	NSWC Dahlgren : Dahlgren, VA	31.991	4.465	Nov 2021	3.880	Oct 2022	5.354	Nov 2023	-		5.354	Continuing	Continuing	Continuing
SNLWS Ship Installation, Integration & Documentation	C/CPAF	BIW : Bath, ME	2.988	0.000		0.000		0.000		-		0.000	0.000	2.988	-
SNLWS Combat System Integration/Licenses	C/CPFF	Lockheed Martin : Moorestown, NJ	12.899	0.000		0.000		0.000		-		0.000	0.000	12.899	-
SNLWS Systems Engineering/Security	WR	NSWC Crane : Crane, IN	0.914	0.170	Nov 2021	0.200	Oct 2022	0.170	Nov 2023	-		0.170	Continuing	Continuing	Continuing
SNLWS Systems Engineering/Installation	WR	NSWC PHD : Port Hueneme, CA	0.957	0.000		0.000		0.000		-		0.000	0.000	0.957	-
SNLWS Systems Engineering	WR	NIWC Pacific : San Diego, CA	0.345	0.000		0.000		0.000		-		0.000	0.000	0.345	-
SNLWS Systems Engineering	WR	NPS : Monterey, CA	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	-
SNLWS Systems Engineering	MIPR	MIT LL : Lexington, MA	0.004	0.000		0.000		0.000		-		0.000	0.000	0.004	-
SNLWS Systems Engineering	C/CPFF	PSU EOC : Freeport, PA	1.300	0.400	Dec 2021	0.350	Mar 2023	0.300	Dec 2023	-		0.300	Continuing	Continuing	Continuing
SNLWS Technical Director	WR	NSWC Crane : Crane, IN	1.274	0.385	Dec 2021	0.350	Oct 2022	0.425	Nov 2023	-		0.425	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electr ic Weapon System				Project (Number/Name) 3402 / Surface Navy Laser Weapon System (SNLWS)					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SNLWS Product Support/ Sys Engr/ISEA/SSA/Doc/ Trng	WR	NSWC PHD : Port Hueneme, CA	3.793	2.755	Nov 2021	3.564	Nov 2022	3.545	Nov 2023	-		3.545	Continuing	Continuing	Continuing
SNLWS Installation APM	WR	NSWC Dahlgren DNA : Dam Neck, VA	0.965	0.000		0.000		0.000		-		0.000	0.000	0.965	-
SNLWS Radar Cross Section Engineering	WR	NSWC Carderock : Potomac, MD	0.029	0.000		0.000		0.000		-		0.000	0.000	0.029	-
SNLWS Environmental Engineering	WR	NUWC Newport : Newport, RI	0.031	0.000		0.000		0.000		-		0.000	0.000	0.031	-
SNLWS System Installation	C/CPAF	BAE via SWRMC : San Diego, CA	10.184	0.000		0.000		0.000		-		0.000	0.000	10.184	-
SNLWS AIT/Engr/Tech/ ILS/Sustainment/Material/ Labor	C/CPIF	Lockheed Martin Aculight : Bothell, WA	11.475	21.254	Dec 2021	5.624	Jan 2023	5.969	Jan 2024	-		5.969	Continuing	Continuing	Continuing
SNLWS Installation Engineering	C/CPAF	Third Party Planning (3PP) : Not Specified	0.005	0.000		0.000		0.000		-		0.000	0.000	0.005	-
SNLWS Laser Range Hazard Analysis	WR	NSWC Corona : Corona, CA	0.039	0.000		0.000		0.000		-		0.000	0.000	0.039	-
SNLWS Platform Integration/ILS/Installation Support	C/CPFF	CACI : Washington, DC	0.285	0.000		0.000		0.000		-		0.000	0.000	0.285	-
SNLWS installation Management & Materials	C/CPFF	NSWC PHD : Virginia Beach, VA	5.256	2.079	Jan 2022	0.000		0.000		-		0.000	0.000	7.335	-
SNLWS Installation/ Shipping	WR	NAVFAC : San Diego, CA	0.001	0.000		0.000		0.000		-		0.000	0.000	0.001	-
SNLWS ILS/Product Support	C/FFP	TMS VIA NSWC IH : Indian Head, MD	0.069	0.000		0.000		0.000		-		0.000	0.000	0.069	-
SNLWS System Engr/ Procurement Beam Director	C/CPFF	MANTECH : Washington, D.C.	0.300	0.000		0.000		0.000		-		0.000	0.000	0.300	-
Subtotal			85.304	31.508		13.968		15.763		-		15.763	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Elect ric Weapon System				Project (Number/Name) 3402 / Surface Navy Laser Weapon System (SNLWS)					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks FY22 funding was decreased to accommodate a BTR to PU 9823 to repair the ODIN unit on the DDG 105 and cover a portion of the SBIR Assessment. FY22 to FY23 decrease is a result of the system installation being completed in FY22. FY23 to FY24 increase is commensurate with the increase in the overall control for operational Fleet support and development of Knowledge Skills and Abilities (KSAs) and Tactics, Techniques and Procedures (TTPs) for the Mk 5 Mod 0 HELIOS on DDG 88.															
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NIWC Pacific : San Diego, CA	0.122	0.000		0.000		0.000		-		0.000	0.000	0.122	-
Developmental Test & Evaluation (DT&E)	WR	NSWC PHD : Port Hueneme, CA	3.659	2.917	Nov 2021	1.549	Nov 2022	2.064	Nov 2023	-		2.064	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NSWC Crane : Crane, IN	2.211	0.636	Nov 2021	0.200	Oct 2022	0.200	Nov 2023	-		0.200	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NSWC Dahlgren : Dahlgren, VA	1.371	0.247	Nov 2021	0.500	Oct 2022	0.417	Nov 2023	-		0.417	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	C/CPIF	Lockheed Martin Aculight : Bothell, WA	7.019	0.351	Dec 2021	0.450	Apr 2023	0.000		-		0.000	0.000	7.820	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC Dahlgren DNA : Dam Neck, VA	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	Threat Systems Management office : Redstone Arsenal, AL	0.581	0.000		0.000		0.000		-		0.000	0.000	0.581	-
Developmental Test & Evaluation (DT&E)	WR	SCSC Wallops : Wallops Island, VA	2.051	0.149	Jan 2022	0.000		0.000		-		0.000	0.000	2.200	-
Developmental Test & Evaluation (DT&E)	WR	NASA Wallops : Wallops Island, VA	1.352	0.139	Jan 2022	0.000		0.000		-		0.000	0.000	1.491	-

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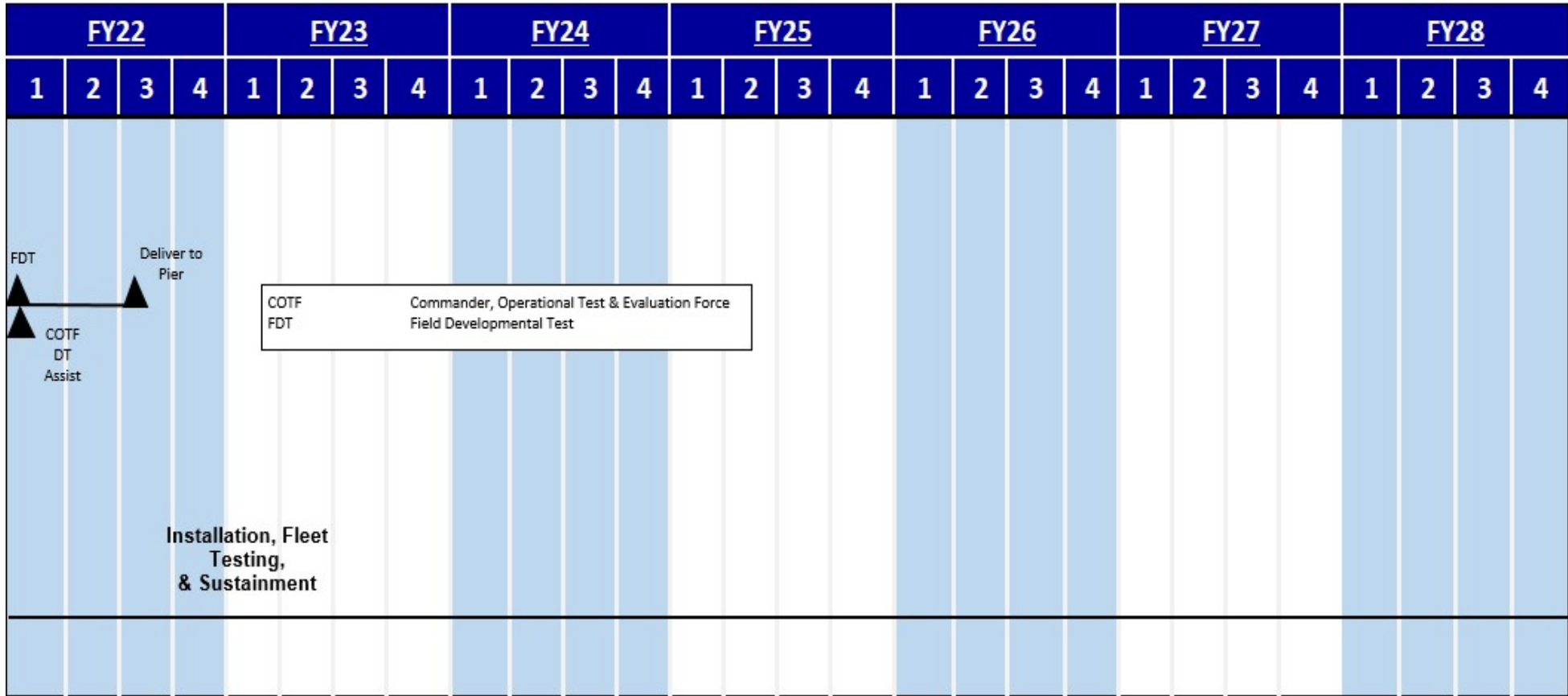
Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Elect ric Weapon System				Project (Number/Name) 3402 / Surface Navy Laser Weapon System (SNLWS)					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NAWC CL : China Lake, AZ	0.616	0.460	Sep 2022	0.068	Mar 2023	0.000		-		0.000	0.000	1.144	-
Developmental Test & Evaluation (DT&E)	WR	NAWC AD : Patuxent River, MD	0.595	0.462	Sep 2022	0.000		0.000		-		0.000	0.000	1.057	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NRL : Washington, D.C.	0.542	0.000		0.000		0.000		-		0.000	0.000	0.542	-
Developmental Test & Evaluation (DT&E)	C/CPFF	PSU EOC : Freeport, PA	0.000	0.100	Dec 2021	0.000		0.100	Dec 2023	-		0.100	Continuing	Continuing	Continuing
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NUWC : Newport, RI	0.029	0.000		0.000		0.000		-		0.000	0.000	0.029	-
Developmental Test & Evaluation (DT&E)	WR	NPS : Monterey, CA	0.045	0.115	Sep 2022	0.000		0.000		-		0.000	0.000	0.160	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	C/FFP	ACC AMIC : Langley AFB, VA	0.273	0.000		0.000		0.000		-		0.000	0.000	0.273	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	MIPR	53 WEG FM : Tyndall AFB, FL	0.108	0.000		0.000		0.000		-		0.000	0.000	0.108	-
Developmental Test & Evaluation (DT&E)	WR	NAWCPM : Point Mugu, CA	0.044	0.524	Sep 2022	0.484	Mar 2023	0.000		-		0.000	0.000	1.052	-
Developmental Test & Evaluation (DT&E)	WR	NSWCPD : Philadelphia, PA	0.000	0.041	Sep 2022	0.000		0.000		-		0.000	0.000	0.041	-
Developmental Test & Evaluation (DT&E)	WR	NSWC Corona : Corona, CA	0.000	0.000		0.015	Mar 2023	0.000		-		0.000	0.000	0.015	-
Subtotal			20.718	6.141		3.266		2.781		-		2.781	Continuing	Continuing	N/A
Remarks															
FY22 to FY23 decrease is due to completion of the majority of the industrial testing accomplished with FY22 funding.															
FY23 decrease since PB23 is primarily due to industrial testing being funded with FY22 dollars. Funds were realigned to cover increased technical & engineering costs incurred by LM Aculight.															
FY23 to FY24 decrease is due to the completion of industrial testing in FY23.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>						Project (Number/Name) 3402 / <i>Surface Navy Laser Weapon System (SNLWS)</i>			
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SNLWS Program Management/Engineering Support	C/CPFF	GRYPHON Technologies : Washington, DC	1.036	0.000		0.000		0.000		-		0.000	0.000	1.036	-
SNLWS Program Management/Engineering Support	C/CPIF	SPA : Washington, DC	4.026	0.947	Dec 2021	0.995	Mar 2023	1.020	Dec 2023	-		1.020	Continuing	Continuing	Continuing
SNLWS Travel	Sub Allot	NAVSEA : Washington, DC	0.084	0.150	Feb 2022	0.125	Mar 2023	0.100	Feb 2024	-		0.100	Continuing	Continuing	Continuing
SNLWS Program Management	C/BA	TMB : Washington, DC	0.984	0.284	Dec 2021	0.330	Feb 2023	0.335	Dec 2023	-		0.335	Continuing	Continuing	Continuing
SNLWS Program Management	C/BA	PSS : Washington, DC	0.000	0.052	Sep 2022	0.265	Jun 2023	0.260	Jun 2024	-		0.260	Continuing	Continuing	Continuing
SNLWS Program Management	C/BA	Strategic Insight : Washington, DC	0.452	0.025	Dec 2021	0.030	Feb 2023	0.035	Dec 2023	-		0.035	Continuing	Continuing	Continuing
SNLWS Program Management	C/BA	BAH : Washington, DC	0.027	0.142	Jun 2022	0.145	Feb 2023	0.145	Feb 2024	-		0.145	0.000	0.459	-
Subtotal			6.609	1.600		1.890		1.895		-		1.895	Continuing	Continuing	N/A
Remarks FY22 decrease in Management is a result of PSS actual costs being lower than planned.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			262.016	39.249		19.124		20.439		-		20.439	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																Date: March 2023			
Appropriation/Budget Activity 1319 / 4								R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System								Project (Number/Name) 3402 / Surface Navy Laser Weapon System (SNLWS)			



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System	Project (Number/Name) 3402 / Surface Navy Laser Weapon System (SNLWS)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3402				
SNLWS: Field Developmental Test (DT)	1	2022	1	2022
SNLWS: Deliver to Pier	1	2022	3	2022
SNLWS: Installation, Fleet Testing and Sustainment	1	2022	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System				Project (Number/Name) 5898 / Directed Energy Components for High Energy Lasers			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
5898: Directed Energy Components for High Energy Lasers	0.000	0.000	14.040	4.825	-	4.825	0.000	0.000	0.000	0.000	0.000	18.865
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

This project is a new start in FY23.

A. Mission Description and Budget Item Justification

Project 5898 - Directed Energy Components for High Energy Lasers: Supports Industrial Base Analysis and Sustainment (IBAS) program efforts for the improvement of the production capability of the industrial base in order to produce Laser Weapon Beam Director (LWBD) components and sub-systems; reduce production lead times of Laser Weapon System Optics; improve quality and reduce production times of Fast Steering Mirror (FSM) and deformable mirrors.

The FY24 budget request supports the completion of the development of the production capability enhancement of the Laser Weapon Beam Director (LWBD) components and sub-systems, coating chambers for laser weapon optics, Fast Steering Mirrors (FSM) and deformable mirrors. This investment is a risk mitigation for manufacturing capability enhancements through the qualification and validation of production equipment and process improvements.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Directed Energy Components for High Energy Lasers	0.000	14.040	4.825	0.000	4.825
Articles:	-	-	-	-	-
FY 2023 Plans: - Commence development of an industrial base production capability to produce LWBD components and subsystems. - Commence development of a coating chambers production capability for laser weapon system optics. - Commence development of a production capability for improvement and reduction in lead time for production for Fast Steering & Deformable Mirrors.					
FY 2024 Base Plans: - Complete development of an industrial base production capability to produce LWBD components and subsystems. - Complete development of a coating chambers production capability for laser weapon system optics.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>		Project (Number/Name) 5898 / <i>Directed Energy Components for High Energy Lasers</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Complete development of a production capability for improvement and reduction in lead time for production for Fast Steering & Deformable Mirrors. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: The FY23 to FY24 decrease is due to the completion of the production capability enhancements developed in FY23.						
Accomplishments/Planned Programs Subtotals		0.000	14.040	4.825	0.000	4.825
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy The effort will utilize Other Transaction Authority (OTA) vehicles in order to obtain personnel with the requisite experience and expertise required to develop the production capability enhancements. The successful OTA contractor(s) could be utilized as supplier(s) for these highly critical, difficult to manufacture components in future laser acquisition contracts.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System				Project (Number/Name) 5898 / Directed Energy Components for High Energy Lasers					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	C/CPFF	PSU EOC : Freeport, PA	0.000	0.000		1.300	Mar 2023	0.860	Dec 2023	-		0.860	0.000	2.160	-
Systems Engineering	WR	NSWC DD : Dahlgren, VA	0.000	0.000		1.850	Mar 2023	0.500	Nov 2023	-		0.500	0.000	2.350	-
Production Capability Enhancements	Various	OTA : TBD	0.000	0.000		10.340	Aug 2023	3.315	Dec 2023	-		3.315	0.000	13.655	-
Subtotal			0.000	0.000		13.490		4.675		-		4.675	0.000	18.165	N/A
Remarks															
Efforts will utilize Other Transaction Authority (OTA) vehicles. The FY23 to FY24 decrease in Product Development is due to the completion of the production capability enhancements developed in FY23.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPIF	SPA : Washington, D.C.	0.000	0.000		0.400	Mar 2023	0.100	Dec 2023	-		0.100	0.000	0.500	-
Program Management Support	C/CPFF	PSS : Washington, D.C.	0.000	0.000		0.150	Apr 2023	0.050	Dec 2023	-		0.050	0.000	0.200	-
Subtotal			0.000	0.000		0.550		0.150		-		0.150	0.000	0.700	N/A
Remarks															
The FY23 to FY24 decrease in management is due to completion of the capability enhancements developed in FY23.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		14.040		4.825		-		4.825	0.000	18.865	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																Date: March 2023			
Appropriation/Budget Activity 1319 / 4								R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System								Project (Number/Name) 5898 / Directed Energy Components for High Energy Lasers			

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 5898																												
Laser Weapon Beam Director (LWBD) Components/Subsystems: Production Capability Improvements																												
Coating Chambers for Laser Weapon System Optics: Production Capability Improvements																												
Fast Steering Mirrors and Deformable Mirrors: Production Capability Improvements																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System	Project (Number/Name) 5898 / Directed Energy Components for High Energy Lasers	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 5898				
Laser Weapon Beam Director (LWBD) Components/Subsystems: Production Capability Improvements	2	2023	4	2024
Coating Chambers for Laser Weapon System Optics: Production Capability Improvements	2	2023	4	2024
Fast Steering Mirrors and Deformable Mirrors: Production Capability Improvements	2	2023	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System				Project (Number/Name) 9823 / Lasers for Navy application			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9823: Lasers for Navy application	148.981	15.621	25.318	20.671	-	20.671	22.837	2.565	2.022	1.897	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Project 9823 - Lasers for Navy Applications: Optical Dazzler Interdictor Navy (ODIN) development provides near-term, directed energy, shipboard Counter-Intelligence, Surveillance, and Reconnaissance (C-ISR) capabilities to dazzle Unmanned Aerial Systems (UASs) and other platforms that address urgent operational needs of the Fleet. FY 2018 was the first year of funding which supports the design, development, procurement and installation of ODIN standalone units over the FYDP, for deployment on DDG 51 Flt IIA surface combatants. The program supports the non-recurring engineering, development, procurement of long lead material, assembly and checkout, system certification, platform integration/installation and sustainment for these ODIN standalone units.												
The FY24 budget request supports the continuation of the development of the technology refresh package and subsystem maturation efforts to improve the reliability, capability and operability of ODIN, and manpower to conduct modeling & simulation of ODIN engagements.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)												
							FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	
Title: Optical Dazzling Interdictor, Navy (ODIN)							15.621	25.318	20.671	0.000	20.671	
Articles:							-	-	-	-	-	
FY 2023 Plans:												
- Continue shipboard technical support for Units 1-7.												
- Continue shipboard test and checkout support of Units 1-7.												
- Continue sustainment support and material procurements for Units 1-7.												
- Continue training updates, updates to maintenance requirements and shipboard allowance documentation.												
- Continue system integration, test and certification, system operability and safety for Unit 8.												
- Initiate subsystem maturation efforts, analysis and documentation.												
- Initiate technical refresh package to include material and assembly drawings.												
- Initiate system engineering for software/hardware updates.												
FY 2024 Base Plans:												
- Continue technical refresh package to include material and assembly drawings.												
- Continue system engineering for software/hardware updates.												
- Commence modeling & simulation of ODIN engagements.												
FY 2024 OCO Plans:												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>		Project (Number/Name) 9823 / <i>Lasers for Navy applicat</i>	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A					
<i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> The decrease from FY23 to FY24 is primarily due to the realignment of RDTEN to OMN to support sustainment of ODIN units delivered to the fleet.					
Accomplishments/Planned Programs Subtotals	15.621	25.318	20.671	0.000	20.671

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• OMN/1C1C/11CD0: <i>Directed Energy</i>	0.000	0.000	3.756	-	3.756	3.728	3.776	3.850	4.068	Continuing	Continuing

Remarks	
FY24 and out O&MN funding was realigned from PE 0603925N/PU 9823 RDT&E to support sustainment of ODIN units delivered to the fleet.	
PY - In FY10 there was Program of Record (POR) funding in the amount of \$4.748M provided under PU 9183 for Pacific Sail which is a related effort.	

D. Acquisition Strategy
The ODIN is a government designed, developed, and produced system that will provide stand alone units for use on DDG 51 class ships. This effort will transition the developed ODIN capabilities to the Fleet, while informing the development of future prototyping capabilities and program of record efforts.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System				Project (Number/Name) 9823 / Lasers for Navy application					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware & Software - Material Buys	C/FFP	NSWC Dahlgren : Dahlgren, VA	45.909	4.143	Dec 2021	2.580	Nov 2022	2.000	Dec 2023	-		2.000	Continuing	Continuing	Continuing
Engineering/Development/ Assembly, Tech Refresh	WR	NSWC Dahlgren : Dahlgren, VA	17.759	4.548	Nov 2021	5.970	Oct 2022	8.295	Dec 2023	-		8.295	Continuing	Continuing	Continuing
Software Development/ System Rqmts & Design	WR	NSWC Dahlgren : Dahlgren, VA	5.865	0.092	Nov 2021	3.112	Oct 2022	3.100	Nov 2023	-		3.100	Continuing	Continuing	Continuing
Engineering Development, HW and SW	C/CPFF	PSU EOC : Freeport, PA	10.699	0.970	Dec 2021	1.850	Dec 2022	1.500	Dec 2023	-		1.500	Continuing	Continuing	Continuing
Engineering/Development/ Material/DMSMS Analysis/ Design	WR	NSWC PHD : Port Hueneme, CA	2.229	0.549	Nov 2021	0.000		0.300	Nov 2023	-		0.300	Continuing	Continuing	Continuing
Engineering/Development	WR	NSWC Crane : Crane, IN	0.320	0.000		0.000		0.000		-		0.000	0.000	0.320	-
Engineering/Development	WR	NRL : Washington, D.C.	0.320	0.000		0.000		0.075	Dec 2023	-		0.075	Continuing	Continuing	Continuing
Subsystem Maturation	Various	OTA : TBD	0.000	0.000		2.000	Apr 2023	2.821	Mar 2024	-		2.821	Continuing	Continuing	Continuing
Test Unit Development & Design	WR	NIWC Pacific : San Diego, CA	0.000	0.000		0.099	Oct 2022	0.300	Nov 2023	-		0.300	Continuing	Continuing	Continuing
Subtotal			83.101	10.302		15.611		18.391		-		18.391	Continuing	Continuing	N/A
Remarks															
- FY22 Product Development increase is the result of a BTR to repair the ODIN unit on the DDG 105 and an additional requirement for Diminishing Manufacturing Sources and Material Shortages (DMSMS) Analysis.															
- FY22 to FY23 increase is a result of tasking driven by classified requirements.															
- FY23 product development decrease from PB23 is a result of requirements being funded by the FY22 BTR received in 4th qtr FY22 and ONR FNC funding. This funding was realigned to Support to cover Shipyard and Product Support; and Test & Evaluation to cover testing requirements.															
- FY23 to FY24 increase is a result of tasking driven by classified requirements.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System				Project (Number/Name) 9823 / Lasers for Navy application					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Platform Integration/ ILS/ Installation	C/CPFF	CACI : Washington, D.C.	0.341	0.000		0.000		0.000		-		0.000	0.000	0.341	-
Platform Integration/ILS/ Installation	C/CPFF	SWRMC : San Diego, CA	1.175	0.000		0.000		0.000		-		0.000	0.000	1.175	-
Systems Engineering/ Mgmt	C/CPFF	NAVFAC : Washington, D.C.	0.125	0.000		0.000		0.000		-		0.000	0.000	0.125	-
Safety, Product Support, Security & Operations	WR	AFRL : Wright-Patterson AFB, OH	0.160	0.000		0.200	Mar 2023	0.000		-		0.000	0.000	0.360	-
Installation Engineering	C/CPAF	Third Party Planning (3PP) : Not Specified	0.007	0.000		0.000		0.000		-		0.000	0.000	0.007	-
Spares	WR	NSWC Dahlgren : Dahlgren, VA	4.108	0.075	Oct 2021	0.000		0.000		-		0.000	0.000	4.183	-
Platform/System Integration/ILS/Installation	WR	NSWC Dahlgren : Dahlgren, VA	13.515	0.438	Oct 2021	0.975	Nov 2023	0.000		-		0.000	0.000	14.928	-
Platform Integration	C/CPAF	BIW : Bath, ME	1.476	0.065	Jan 2022	0.050	Feb 2023	0.000		-		0.000	0.000	1.591	-
Platform Integration	C/CPFF	Lockheed Martin : Moorestown, NJ	0.323	0.000		0.000		0.000		-		0.000	0.000	0.323	-
Systems Engineering/ Platform Integration	WR	NIWC Pacific : San Diego, CA	1.191	0.046	Dec 2021	0.000		0.000		-		0.000	0.000	1.237	-
Safety, Product Support, Security & Operations	WR	NSWC Dahlgren : Dahlgren, VA	5.359	0.332	Oct 2021	2.413	Nov 2023	0.000		-		0.000	0.000	8.104	-
Platform Integration	WR	NSWC Crane : Crane, IN	0.156	0.000		0.000		0.000		-		0.000	0.000	0.156	-
Platform/System Integration/Integrated Logistic Support/ Installation & Spares	WR	NSWC PHD : Port Hueneme, CA	7.422	1.224	Oct 2021	2.798	Oct 2022	0.500	Nov 2023	-		0.500	Continuing	Continuing	Continuing
Packaging, Handling, Storage & Transportation, De-Install, Refurbishment	WR	NSWC Dahlgren : Dahlgren, VA	1.414	0.040	Oct 2021	0.000		0.000		-		0.000	0.000	1.454	-
Platform Integration/ILS/ Installation	C/CPFF	HRMC : Pearl Harbor, HI	0.021	0.000		0.000		0.000		-		0.000	0.000	0.021	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603925N / <i>Directed Energy and Electric Weapon System</i>						Project (Number/Name) 9823 / <i>Lasers for Navy application</i>			
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Platform/System Integration/ILS/Installation & Spares	C/CPFF	NSWC PHD : Port Hueneme, CA	15.874	1.322	Dec 2021	0.587	Oct 2022	0.000		-		0.000	0.000	17.783	-
Packaging, Handling, Storage & Transportation	C/CPFF	PSU EOC : Freeport, PA	0.425	0.000		0.000		0.000		-		0.000	0.000	0.425	-
Systems Engineering	C/CPFF	PSU EOC : Freeport, PA	0.700	0.000		0.000		0.000		-		0.000	0.000	0.700	-
Systems Engineering/Mgmt	WR	Pax Partnership : Patuxent, MD	0.142	0.000		0.000		0.000		-		0.000	0.000	0.142	-
Platform Integration/ILS/Installation	C/FFP	TMS via NSWC IH : Indian Head, MD	0.069	0.000		0.000		0.000		-		0.000	0.000	0.069	-
Platform Integration/ILS/Installation	C/CPFF	NWRMC Puget Sound Naval Shipyard : Bremerton, WA	0.200	0.000		0.443	Feb 2023	0.000		-		0.000	0.000	0.643	-
Reliability, Maintainability & Assessment	WR	NSWC Corona : Corona, CA	0.000	0.185	Aug 2022	0.000		0.000		-		0.000	0.000	0.185	-
Reliability, Maintainability & Assessment	MIPR	MIT LL : Cambridge MA	0.000	0.000		0.050	Mar 2023	0.000		-		0.000	0.000	0.050	-
Subtotal			54.203	3.727		7.516		0.500		-		0.500	Continuing	Continuing	N/A
Remarks - FY22 funding was decreased to cover the additional requirement for DMSMS Analysis under Product Development and accommodate the SBIR assessment. - FY23 increase from PB23 was to accommodate the Shipyard and Product Support requirements. This funding was realigned from Product Development. Funding has been realigned from multiple activities to support shipyard and support requirements. - FY23 to FY24 decrease is primarily due to the realignment of RD TEN to O&MN to support sustainment of ODIN units delivered to the fleet.															

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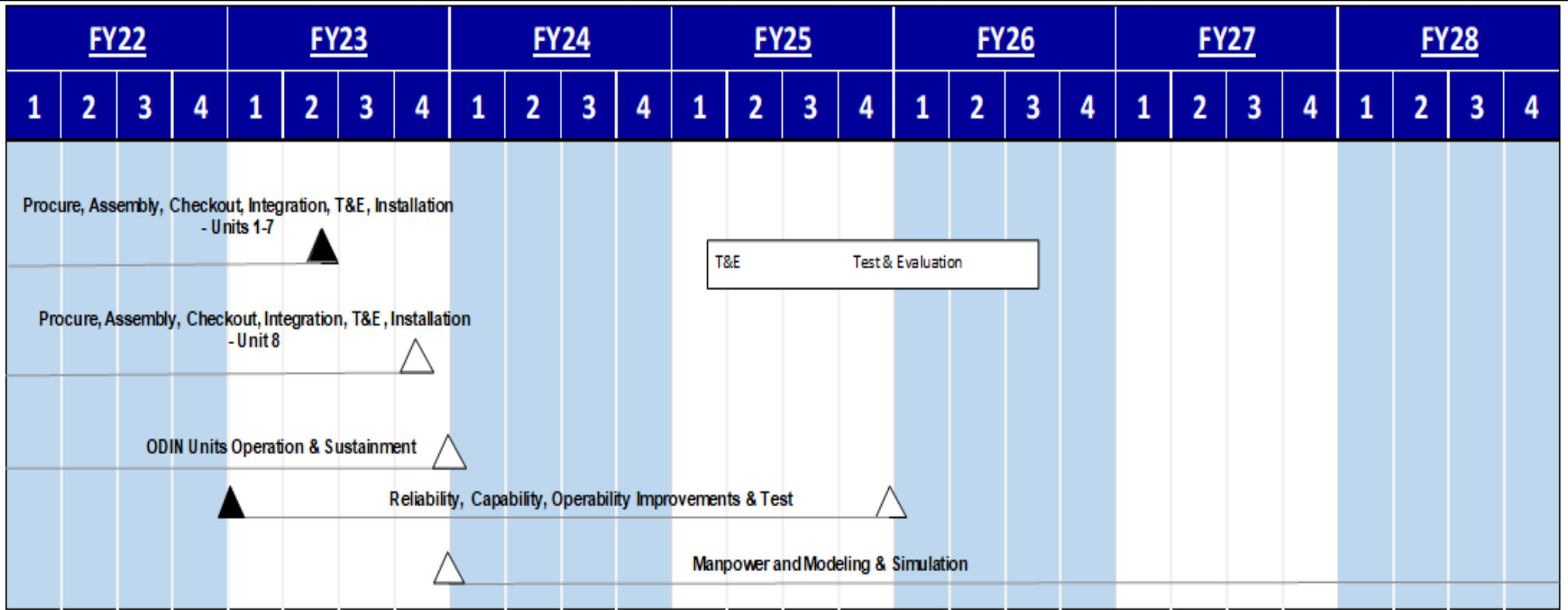
Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System				Project (Number/Name) 9823 / Lasers for Navy application					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NAWC AD : Patuxent River, MD	0.160	0.000		0.000		0.000		-		0.000	0.000	0.160	-
Developmental Test & Evaluation (DT&E)	WR	NSWC PHD : Port Hueneme, CA	1.659	0.553	Oct 2021	0.115	Mar 2023	0.000		-		0.000	0.000	2.327	-
Developmental Test & Evaluation (DT&E)	WR	NSWC Dahlgren : Dahlgren, VA	5.747	0.054	Oct 2021	0.856	Mar 2023	0.250	Jan 2024	-		0.250	Continuing	Continuing	Continuing
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC Crane : Crane, IN	0.650	0.000		0.000		0.000		-		0.000	0.000	0.650	-
Developmental Test & Evaluation (DT&E)	WR	NIWC Pacific : San Diego, CA	0.504	0.000		0.051	Mar 2023	0.200	Jan 2024	-		0.200	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	MIPR	NSMA, COTF : JBAB, D.C.	0.165	0.028	Jun 2022	0.044	Mar 2023	0.000		-		0.000	0.000	0.237	-
Developmental Test & Evaluation (DT&E)	WR	WSMR : White Sands, NM	0.000	0.000		0.000		0.500	Jan 2024	-		0.500	Continuing	Continuing	Continuing
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC Corona : Corona, CA	0.024	0.000		0.000		0.000		-		0.000	0.000	0.024	-
Subtotal			8.909	0.635		1.066		0.950		-		0.950	Continuing	Continuing	N/A
Remarks															
- FY22 funding was increased due to testing of newly developed capabilities requiring a higher quality and quantity of aircraft and targets for testing of subsequent data analysis to validate requisite system capabilities.															
- FY23 increase from PB23 was due to the delay of the DDG 97 Industrial Availability which pushed testing from FY22 to FY23.															
- FY23 to FY24 decrease is a result of the majority of the testing being accomplished in FY23.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Mgmt/Support	C/CPIF	PSS : Washington, D.C.	0.000	0.052	Sep 2022	0.250	Jun 2023	0.150	Jun 2024	-		0.150	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System						Project (Number/Name) 9823 / Lasers for Navy application			
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Mgmt/Support	C/CPIF	Strategic Insight : Washington, D.C.	0.153	0.010	Jan 2023	0.025	Mar 2023	0.010	Dec 2023	-		0.010	0.000	0.198	-
Program Mgmt/Support	C/CPIF	TMB : Washington, D.C.	0.341	0.145	Dec 2021	0.141	Mar 2023	0.145	Dec 2023	-		0.145	Continuing	Continuing	Continuing
Program Mgmt/Support	C/CPFF	GRYPHON Technologies : Washington, D.C.	1.086	0.000		0.000		0.000		-		0.000	0.000	1.086	-
Travel	Allot	NAVSEA : Washington, D.C.	0.088	0.050	Feb 2022	0.025	Mar 2023	0.025	Feb 2024	-		0.025	Continuing	Continuing	Continuing
Program Mgmt/Support	C/CPIF	SPA : Washington, D.C.	1.008	0.700	Feb 2022	0.684	Mar 2023	0.500	Mar 2024	-		0.500	Continuing	Continuing	Continuing
Program Mgmt/Support	C/CPIF	BAH : Washington, D.C.	0.092	0.000		0.000		0.000		-		0.000	0.000	0.092	-
Subtotal			2.768	0.957		1.125		0.830		-		0.830	Continuing	Continuing	N/A
Remarks															
- The FY23 to FY24 decrease is primarily due to the realignment of RDTEN to O&MN.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			148.981	15.621		25.318		20.671		-		20.671	Continuing	Continuing	N/A
Remarks															
- The FY23 to FY24 decrease is primarily due to the realignment of RDTEN to O&MN to support sustainment of ODIN units delivered to the fleet.															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																Date: March 2023			
Appropriation/Budget Activity 1319 / 4												R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System				Project (Number/Name) 9823 / Lasers for Navy application			



- NOTES:
- 1. T&E includes shore-based testing during assembly through shipboard testing after installation.
 - 2. Above schedule addresses ship availability changes that have occurred since the FY23 President's Budget submission.
 - 3. Starting in FY24, funding for the operation and sustainment of 8 ODIN units was converted to O&MN.
 - 4. RM&A improvements FY23-FY25; Starting in FY24, funding for manpower and Modeling & Simulation.

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603925N / Directed Energy and Electric Weapon System	Project (Number/Name) 9823 / Lasers for Navy application	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9823				
Component Procurement, Assembly, Checkout, Integration, T&E & Installation Units 1-7	1	2022	2	2023
Component Procurement, Assembly, Checkout, Integration, T&E & Installation Unit 8	1	2022	4	2023
Operation and Sustainment of ODIN Units	1	2022	4	2023
Reliability, Capability, Operability Improvements & Test	1	2023	4	2025
Modeling & Simulation and Manpower	1	2024	4	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0604014N I F/A-18 Infrared Search and Track (IRST)							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	363.542	47.637	55.069	32.127	-	32.127	12.502	1.564	0.056	0.058	0.000	512.555
2069: F/A-18 Infrared Search and Track (IRST)	363.542	47.637	40.069	32.127	-	32.127	12.502	1.564	0.056	0.058	0.000	497.555
9999: Congressional Adds	0.000	0.000	15.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.000
Program MDAP/MAIS Code: Project MDAP/MAIS Code(s): P510												
A. Mission Description and Budget Item Justification The AN/ASG-34A(V)1 F/A-18E/F Infrared Search and Track (IRST) system is a long-wave infrared sensor that provides a passive, out-of-band, alternate fire control system capable of detecting, tracking and engaging airborne targets, at long range, in a heavy electronic attack or radar-denied environment. IRST Block II is the primary out-of-band fire-control system for the F/A-18E/F, critical to organic passive air-to-air kill-chains required to compete with peer adversaries. Enables F/A-18E/F lethality by providing a passive means to detect, track, and target aircraft in highly contested environments in support of the objectives outlined in the National Defense Strategy. IRST enhances survivability by providing a fire-control solution without the need to radiate in the RF spectrum. The IRST system can autonomously, or in combination with other sensors, support the guidance of beyond-visual-range missiles including AIM-120C/D and AIM-9X Block II. The F/A-18E/F IRST system is an evolutionary Navy acquisition program with Block I and Block II capabilities. The USN is committed to further development of this component of the passive kill chain. This budget request supports Block II development and testing of a redesigned Infrared Receiver (IRR) and processor, enabling full Capabilities Development Document (CDD) capability over a larger field of regard. This budget request also supports development and testing of a redesigned Read-Out Integrated Circuit (ROIC). The ROIC vendor is not able to sustain production of the current design. The redesign will yield a more reliable configuration with potential production cost avoidances due to less usage of higher cost materials. IRST was previously funded under Program Element 0204136N F/A-18 Squadrons and has been transferred to Program Element 0604014N F/A-18 Infrared Search and Track.												

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0604014N / F/A-18 Infrared Search and Track (IRST)				
B. Program Change Summary (\$ in Millions)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget		48.793	40.069	21.590	-	21.590
Current President's Budget		47.637	55.069	32.127	-	32.127
Total Adjustments		-1.156	15.000	10.537	-	10.537
• Congressional General Reductions		-	-			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	15.000			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-1.156	0.000			
• Program Adjustments		0.000	0.000	10.500	-	10.500
• Rate/Misc Adjustments		0.000	0.000	0.037	-	0.037
Congressional Add Details (\$ in Millions, and Includes General Reductions)						
Project: 9999: Congressional Adds						
Congressional Add: Disruptive air and missile defense						
Congressional Add Subtotals for Project: 9999						
Congressional Add Totals for all Projects						
Change Summary Explanation						
Cost:						
2069: The FY2024 funding request was increased \$10.500 million for IRST Read Out Integrated Circuit (ROIC) Redesign and \$.037 million for miscellaneous adjustments.						
9999: FY2023 \$15.000 million added for Disruptive Air and Missile Defense.						
Technical: Not Applicable						
Schedule:						
2069:						
- Added Gate 6/CSB to 2Q FY23						
- Updated FRP DR from 3Q FY24 to 1Q FY25						
- Removed High Speed Mod as it is not being funded as part of the program execution						
- Updated Test and Evaluation activities to align with FY24 IOC						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	
1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	PE 0604014N / F/A-18 Infrared Search and Track (IRST)	
<div>- Updated production milestones and asset delivery to align with the APN-5 BLI 0515 9999:</div> <div>- Added schedule for Disruptive Air and Missile Defense</div>		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023																																
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604014N / F/A-18 Infrared Search and Track (IRST)				Project (Number/Name) 2069 / F/A-18 Infrared Search and Track (IRST)																																	
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost																														
2069: F/A-18 Infrared Search and Track (IRST)	363.542	47.637	40.069	32.127	-	32.127	12.502	1.564	0.056	0.058	0.000	497.555																														
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-																																
Project MDAP/MAIS Code: P510																																										
<p>Note</p> <p>Infrared Search and Track (IRST) was funded in FY16 and prior under PE 0204136N / F/A-18 Squadrons, PU 1662 F/A-18 Improvements. Funding was realigned to a new PU 2069 / F/A-18 IRST in FY17 and then transferred to a new PE 0604014N / F/A-18 IRST under PU 2069 / F/A-18 IRST in FY18.</p> <p>A. Mission Description and Budget Item Justification</p> <p>The AN/ASG-34A(V)1 F/A-18E/F Infrared Search and Track (IRST) system is a long-wave infrared sensor that provides a passive, out-of-band, alternate fire control system capable of detecting, tracking and engaging airborne targets, at long range, in a heavy electronic attack or radar-denied environment. IRST Block II is the primary out-of-band fire-control system for the F/A-18E/F, critical to organic passive air-to-air kill-chains required to compete with peer adversaries. Enables F/A-18E/F lethality by providing a passive means to detect, track, and target aircraft in highly contested environments in support of the objectives outlined in the National Defense Strategy. IRST enhances survivability by providing a fire-control solution without the need to radiate in the RF spectrum. The IRST system can autonomously, or in combination with other sensors, support the guidance of beyond-visual-range missiles including AIM-120C/D and AIM-9X Block II. The F/A-18E/F IRST system is an evolutionary Navy acquisition program with Block I and Block II capabilities. The USN is committed to further development of this component of the passive kill chain.</p> <p>This budget request supports Block II development and testing of a redesigned Infrared Receiver (IRR) and processor, enabling full Capabilities Development Document (CDD) capability over a larger field of regard.</p> <p>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</p> <table><tr><td></td><td>FY 2022</td><td>FY 2023</td><td>FY 2024 Base</td><td>FY 2024 OCO</td><td>FY 2024 Total</td></tr><tr><td>Title: Infra-Red Search and Track (IRST)</td><td>47.637</td><td>40.069</td><td>32.127</td><td>0.000</td><td>32.127</td></tr><tr><td>Articles:</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>Description: Technology Development (TD) and Engineering and Manufacturing Development (EMD) of a fully integrated airborne IRST sensor for the F/A-18E/F.</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Block II is an engineering change to the Block I system which redesigns the Infrared Receiver (IRR) and processor to provide full Capabilities Development Document (CDD) capability over a larger field of regard. Block II will provide longer-range passive detection and tracking performance which enhances warfighting capability through improved engagement timelines and increased situational awareness.</td><td></td><td></td><td></td><td></td><td></td></tr></table>														FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	Title: Infra-Red Search and Track (IRST)	47.637	40.069	32.127	0.000	32.127	Articles:	-	-	-	-	-	Description: Technology Development (TD) and Engineering and Manufacturing Development (EMD) of a fully integrated airborne IRST sensor for the F/A-18E/F.						Block II is an engineering change to the Block I system which redesigns the Infrared Receiver (IRR) and processor to provide full Capabilities Development Document (CDD) capability over a larger field of regard. Block II will provide longer-range passive detection and tracking performance which enhances warfighting capability through improved engagement timelines and increased situational awareness.					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total																																					
Title: Infra-Red Search and Track (IRST)	47.637	40.069	32.127	0.000	32.127																																					
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Description: Technology Development (TD) and Engineering and Manufacturing Development (EMD) of a fully integrated airborne IRST sensor for the F/A-18E/F.																																										
Block II is an engineering change to the Block I system which redesigns the Infrared Receiver (IRR) and processor to provide full Capabilities Development Document (CDD) capability over a larger field of regard. Block II will provide longer-range passive detection and tracking performance which enhances warfighting capability through improved engagement timelines and increased situational awareness.																																										

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604014N / F/A-18 Infrared Search and Track (IRST)		Project (Number/Name) 2069 / F/A-18 Infrared Search and Track (IRST)	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p><i>FY 2023 Plans:</i> Complete IRST Block II Development Phase 2 (EMD) effort. Conduct Block II flight testing for verification of correction of deficiencies identified in Block II Operational Test. Begin implementation of redesigns & changes identified as part of engineering and logistics analysis.</p> <p><i>FY 2024 Base Plans:</i> Complete IOT&E, continue Block II flight testing for verification of correction of deficiencies identified in Block II Operational Test. Begin follow on development efforts for capability enhancements (sensor improvements). Continue implementation of redesigns & changes identified as part of engineering and logistics analysis. Continue hardware and software development for Read Out Integrated Circuit (ROIC) obsolescence redesign.</p> <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Decrease from FY 2023 to FY 2024 of \$7.942 million due to completion of Block II Development Phase 2 (EMD) effort.</p>					
Accomplishments/Planned Programs Subtotals	47.637	40.069	32.127	0.000	32.127

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• APN/0515: <i>Infrared Search and Track (IRST)</i>	120.377	121.039	179.193	-	179.193	172.818	153.095	157.116	42.501	30.918	1,074.483

Remarks

D. Acquisition Strategy

F/A-18E/F Block II IRST is an ECP to the Block I system employing an incremental approach to development and integration. The F/A-18E/F IRST Block II Pre-Development IPR-1 was conducted in October 2017 and the Block II ECP achieved Milestone C on 4 December 2018. Based on lead times required for some hardware components and urgency of need, development is being executed incrementally with some concurrency with production activities. The concurrency risk was accepted based on proven technology elements, high confidence in design stability, and a planned demonstration of readiness for production at rate.

The incremental approach to development presently underway has been impacted by first article HW delays. Despite delays, data from the incremental development continues to support confidence in the design stability with a plan to demonstrate manufacturing readiness for full rate by Q4 FY2023. Flight-testing of the new critical

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604014N / F/A-18 Infrared Search and Track (IRST)	Project (Number/Name) 2069 / F/A-18 Infrared Search and Track (IRST)
<p>technology began in 2019 with Block I AV6+ systems. Further development of the Block II hardware continued in parallel with the extended fleet demo with flight testing beginning in November 2019 on a Block II capital asset and continuing in March 2020 with prototype sensors which contain all critical HW elements to evaluate Block II performance. The prototype systems are fully integrated with the aircraft and contain all SW elements needed to deliver Capability Development Document (CDD) performance. Analysis of Multi-plane testing of the prototype systems conducted in 2021 has shown considerable margin to CDD Key Performance Parameters. Prototype systems continue to support integration with the F/A-18E/F Advanced Mission Computer software through flight testing with SCS H18. The final hardware configuration began flight testing in Q2 FY2023. Based on the revised APB and program schedule, F/A-18E/F IRST Block II is on track to IOC in Q3 FY2024, bringing critical out-of-band detection and weapon-quality-track capability against advanced air threats.</p>		

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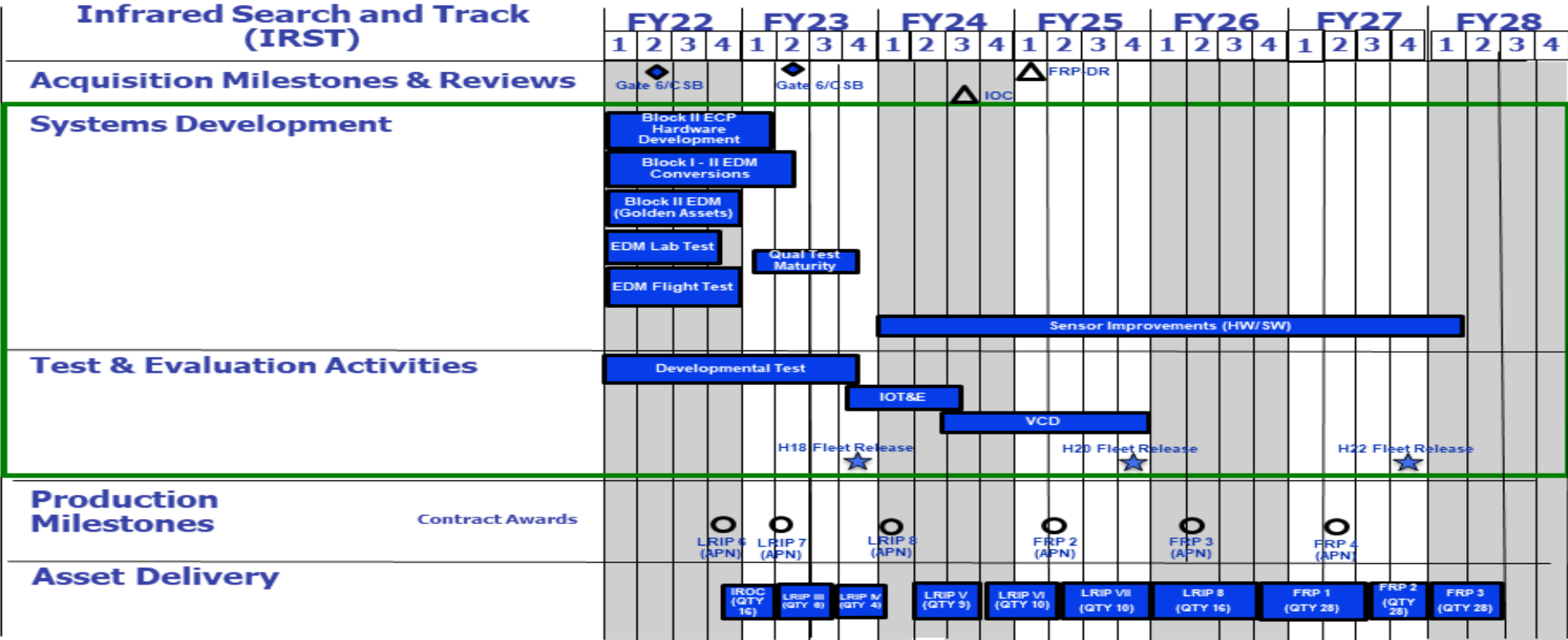
Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604014N / F/A-18 Infrared Search and Track (IRST)				Project (Number/Name) 2069 / F/A-18 Infrared Search and Track (IRST)					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Development (Hardware/Software) Infra-Red Search and Track	Various	Boeing : St. Louis, MO	200.457	12.540	Dec 2021	6.404	Dec 2022	2.928	Dec 2023	-		2.928	0.854	223.183	223.079
Product Development (ROIC Redesign)	C/IDIQ	Boeing : St. Louis, MO	0.000	10.500	Oct 2022	0.000		10.500	Oct 2023	-		10.500	0.000	21.000	21.000
Primary Development	Various	NSMA : Various	113.451	17.429	Jan 2022	26.629	Nov 2022	3.436	Nov 2023	-		3.436	7.101	168.046	-
Prior Year Prod Dev no longer funded in FYDP	Various	Various : Various	15.639	0.000		0.000		0.000		-		0.000	0.000	15.639	-
Subtotal			329.547	40.469		33.033		16.864		-		16.864	7.955	427.868	N/A
Remarks FY2024 decrease in hardware and software development due the ramp down of development activity as the system reaches IOC.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	NAWCWD : China Lake, CA	5.265	0.659	Mar 2022	0.681	Nov 2022	0.704	Nov 2023	-		0.704	2.444	9.753	-
Development Support	WR	NAWCAD : Patuxent River, MD	4.337	0.200	Jan 2022	0.200	Nov 2022	0.256	Nov 2023	-		0.256	0.257	5.250	-
Development Support	WR	NAVSUP : Mechanicsburg, PA	0.041	0.000		0.020	Oct 2022	0.020	Oct 2023	-		0.020	0.020	0.101	-
Prior Year Support no longer funded in FYDP	Various	Various : Various	2.162	0.000		0.000		0.000		-		0.000	0.000	2.162	-
Subtotal			11.805	0.859		0.901		0.980		-		0.980	2.721	17.266	N/A
Remarks FY2024 increase for support efforts as the program reaches IOC in 2024.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604014N / F/A-18 Infrared Search and Track (IRST)				Project (Number/Name) 2069 / F/A-18 Infrared Search and Track (IRST)					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Test & Evaluation (OT&E)	WR	NAWCAD : Patuxent River, MD	6.244	1.668	Jan 2022	2.948	Nov 2022	1.666	Nov 2023	-		1.666	2.946	15.472	-
Operational Test & Evaluation (OT&E)	Various	OPTEVFOR : VX-9	0.422	0.000		0.679	Jul 2023	2.121	Jul 2024	-		2.121	0.503	3.725	-
Developmental Test & Evaluation (DT&E)	WR	NAWCWD : China Lake, CA	12.988	3.589	Jan 2022	2.463	Nov 2022	7.506	Nov 2023	-		7.506	0.000	26.546	-
Operational Test & Evaluation (OT&E)	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		2.945	Nov 2023	-		2.945	0.000	2.945	-
Live Fire Test & Evaluation (LFT&E)	MIPR	Eglin AFB : Eglin AFB	0.000	1.034	Jun 2022	0.000		0.000		-		0.000	0.000	1.034	-
Subtotal			19.654	6.291		6.090		14.238		-		14.238	3.449	49.722	N/A
Remarks FY2024 increase in T&E due to operational test and live fire events to reach IOC.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Various	NAVAIR : Patuxent River, MD	0.076	0.018	Oct 2021	0.045	Oct 2022	0.045	Oct 2023	-		0.045	0.045	0.229	-
Program Management Support - MISC	Various	NAWCAD : Patuxent River, MD	2.460	0.000	Oct 2021	0.000		0.000		-		0.000	0.000	2.460	-
Subtotal			2.536	0.018		0.045		0.045		-		0.045	0.045	2.689	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			363.542	47.637		40.069		32.127		-		32.127	14.170	497.545	N/A
Remarks															

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604014N / F/A-18 Infrared Search and Track (IRST)	Project (Number/Name) 2069 / F/A-18 Infrared Search and Track (IRST)

F/A-18 Infrared Search and Track (IRST)



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604014N / F/A-18 Infrared Search and Track (IRST)	Project (Number/Name) 2069 / F/A-18 Infrared Search and Track (IRST)	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Infra-Red Search and Track</i>				
Acquisition Milestones: Milestones: Full Rate Production Decision Review (FRP DR)	1	2025	1	2025
Acquisition Milestones: Milestones: Gate 6 / CSB (IPR 1)	2	2022	2	2022
Acquisition Milestones: Milestones: Gate 6 / CSB (IPR 2)	2	2023	2	2023
Acquisition Milestones: Milestones: Initial Operating Capability (IOC)	3	2024	3	2024
System Development: Engineering and Manufacturing Development: Block II ECP Hardware Development	1	2022	1	2023
System Development: Engineering and Manufacturing Development: Block I/II EDM Conversions	1	2022	2	2023
System Development: Engineering and Manufacturing Development: Block II EDM (Golden Assets)	1	2022	4	2022
System Development: Development Testing: EDM Lab Test	1	2022	4	2022
System Development: Development Testing: EDM Flight Test	1	2022	4	2022
System Development: Development Testing: Qual Test Maturity	1	2023	4	2023
System Development: Development Testing: Sensor Improvements (HW/SW)	1	2024	1	2028
Test and Evaluation: Operational Testing: Developmental Test	1	2022	4	2023
Test and Evaluation: Operational Testing: IOT&E	4	2023	3	2024
Test and Evaluation: Operational Testing: VCD	2	2024	4	2025
Test and Evaluation: Operational Testing: H18 Fleet Release	4	2023	4	2023
Test and Evaluation: Operational Testing: H20 Fleet Release	4	2025	4	2025
Test and Evaluation: Operational Testing: H22 Fleet Release	4	2027	4	2027
Production Milestones: Contract Awards: Block II LRIP 6 (APN)	4	2022	4	2022
Production Milestones: Contract Awards: Block II LRIP 7 (APN)	2	2023	2	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604014N / F/A-18 Infrared Search and Track (IRST)		Project (Number/Name) 2069 / F/A-18 Infrared Search and Track (IRST)
		Start		End
Events by Sub Project		Quarter	Year	Quarter
Production Milestones: Contract Awards: Block II LRIP 8 (APN)		1	2024	1
Production Milestones: Contract Awards: Block II FRP 1 (APN)		3	2024	3
Production Milestones: Contract Awards: Block II FRP 2 (APN)		1	2025	1
Production Milestones: Contract Awards: Block II FRP 3 (APN)		1	2026	1
Production Milestones: Contract Awards: Block II FRP 4 (APN)		2	2027	2
Production Milestones: Asset Delivery: IROC (QTY 16)		4	2022	1
Production Milestones: Asset Delivery: LRIP 3 (Block II Lot 1 - Qty 6)		2	2023	3
Production Milestones: Asset Delivery: LRIP 4 (Block II Lot 2 - Qty 4)		3	2023	4
Production Milestones: Asset Delivery: LRIP 5 (Block II Lot 3 - Qty 9)		2	2024	3
Production Milestones: Asset Delivery: LRIP 6 (Block II Lot 4 - Qty 10)		4	2024	1
Production Milestones: Asset Delivery: LRIP 7 (Block II Lot 5 - Qty 10)		2	2025	4
Production Milestones: Asset Delivery: LRIP 8 (Block II Lot 6 - Qty 16)		1	2026	3
Production Milestones: Asset Delivery: FRP 1 (Block II Lot 4 - Qty 28)		4	2026	3
Production Milestones: Asset Delivery: FRP 2 (Block II Lot 5 - Qty 28)		2	2027	4
Production Milestones: Asset Delivery: FRP 3 (Block II Lot 6 - Qty 28)		1	2028	2

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604014N / F/A-18 Infrared Search and Track (IRST)				Project (Number/Name) 9999 / Congressional Adds			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	0.000	0.000	15.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification
 Disruptive Air and Missile Defense: Research, Development, Test and Evaluation (RDT&E) funding to support the maturation of capability gaps identified in Integrated Priority List and Urgent Operational needs requiring new passive sensing and engagement options in air, sea and land domains. Due to nature of these efforts, specific descriptions and detailed plans are available at higher classification levels.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023
Congressional Add: Disruptive air and missile defense	0.000	15.000
FY 2022 Accomplishments: N/A		
FY 2023 Plans: N/A		
Congressional Adds Subtotals	0.000	15.000

C. Other Program Funding Summary (\$ in Millions)
 N/A

Remarks

D. Acquisition Strategy
 N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604014N / F/A-18 Infrared Search and Track (IRST)					Project (Number/Name) 9999 / Congressional Adds				
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Need Item Text	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Subtotal			0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Integration Support	RO	TBD : TBD	0.000	0.000		3.000	Aug 2023	0.000		-		0.000	0.000	3.000	-
Subtotal			0.000	0.000		3.000		0.000		-		0.000	0.000	3.000	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	RO	TBD : TBD	0.000	0.000		8.000	Aug 2023	0.000		-		0.000	0.000	8.000	-
Live Fire Test & Evaluation (LFT&E)	RO	TBD : TBD	0.000	0.000		4.000	Oct 2023	0.000		-		0.000	0.000	4.000	-
Subtotal			0.000	0.000		12.000		0.000		-		0.000	0.000	12.000	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		15.000		0.000		-		0.000	0.000	15.000	N/A
Remarks															

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PE 0604014N: *F/A-18 Infrared Search and Track (IRST)*
Navy

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Disruptive Air and Missile Defense	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Systems Development							Disruptive System Integration Planning																									
Test & Evaluation							Development T&E																									
							Disruptive Live Fire T&E																									

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604014N / F/A-18 Infrared Search and Track (IRST)	Project (Number/Name) 9999 / Congressional Adds

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
Disruptive System Integration Planning: System Integration Support	3	2023	4	2024
Disruptive Live Fire Test & Evaluation: Development T&E	1	2023	4	2024
Disruptive Live Fire Test & Evaluation: LFT&E	4	2023	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	PE 0604027N / <i>Digital Warfare</i>											
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	89.711	44.969	165.753	181.001	-	181.001	139.103	136.748	137.440	140.221	Continuing	Continuing
3253: <i>Common Weapon Datalink Radio</i>	0.000	6.117	16.950	34.579	-	34.579	2.112	1.580	0.575	0.588	Continuing	Continuing
3255: <i>Decision Support Tools and AI Development</i>	28.791	11.650	43.441	44.998	-	44.998	45.527	46.442	47.379	48.335	Continuing	Continuing
3256: <i>Warfighting Pilots</i>	4.837	3.784	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.621
3425: <i>Digital Warfare</i>	56.083	23.418	105.362	101.424	-	101.424	91.464	88.726	89.486	91.298	Continuing	Continuing

A. Mission Description and Budget Item Justification

The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	46.769	165.753	179.024	-	179.024
Current President's Budget	44.969	165.753	181.001	-	181.001
Total Adjustments	-1.800	0.000	1.977	-	1.977
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.800	0.000			
• Rate/Misc Adjustments	0.000	0.000	1.977	-	1.977

Change Summary Explanation

The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604027N / Digital Warfare				Project (Number/Name) 3253 / Common Weapon Datalink Radio			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3253: Common Weapon Datalink Radio	0.000	6.117	16.950	34.579	-	34.579	2.112	1.580	0.575	0.588	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Common Weapon Datalink Radio Articles:								6.117	16.950	34.579	0.000	34.579
								-	-	-	-	-
FY 2023 Plans: The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.												
FY 2024 Base Plans: The details of this project are classified SECRET and are submitted annually to Congress in the classified budget justification books.												
FY 2024 OCO Plans: N/A												
FY 2023 to FY 2024 Increase/Decrease Statement: The details of this project are classified SECRET and are submitted annually to Congress in the classified budget justification books.												
Accomplishments/Planned Programs Subtotals								6.117	16.950	34.579	0.000	34.579
C. Other Program Funding Summary (\$ in Millions) N/A												
Remarks												
D. Acquisition Strategy The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.												

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604027N / Digital Warfare				Project (Number/Name) 3253 / Common Weapon Datalink Radio					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Classified	C/CPFF	TBD : Not Specified	0.000	6.117	Dec 2021	16.950	Dec 2022	34.579	Dec 2023	-		34.579	Continuing	Continuing	Continuing
Subtotal			0.000	6.117		16.950		34.579		-		34.579	Continuing	Continuing	N/A
Remarks															
The details of this project are classified SECRET and are submitted annually to Congress in the classified budget justification books.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	6.117		16.950		34.579		-		34.579	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604027N / <i>Digital Warfare</i>	Project (Number/Name) 3253 / <i>Common Weapon Datalink Radio</i>	

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 3253																												
Common Weapon Datalink Radio: Classified																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604027N / <i>Digital Warfare</i>	Project (Number/Name) 3253 / <i>Common Weapon Datalink Radio</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 3253</i>				
Common Weapon Datalink Radio: Classified	1	2022	3	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604027N / <i>Digital Warfare</i>				Project (Number/Name) 3255 / <i>Decision Support Tools and AI Development</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3255: <i>Decision Support Tools and AI Development</i>	28.791	11.650	43.441	44.998	-	44.998	45.527	46.442	47.379	48.335	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification
The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Artificial Intelligence Development Operations (AI DevOps)	11.650	43.441	44.998	0.000	44.998
Articles:	-	-	-	-	-
FY 2023 Plans: The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.					
FY 2024 Base Plans: The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.					
FY 2024 OCO Plans: N/A					
FY 2023 to FY 2024 Increase/Decrease Statement: The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.					
Accomplishments/Planned Programs Subtotals	11.650	43.441	44.998	0.000	44.998

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604027N / Digital Warfare				Project (Number/Name) 3255 / Decision Support Tools and AI Development					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Classified	C/CPFF	TBD : Not Specified	28.791	11.650	Dec 2021	43.441	Dec 2022	44.998	Dec 2023	-		44.998	Continuing	Continuing	Continuing
Subtotal			28.791	11.650		43.441		44.998		-		44.998	Continuing	Continuing	N/A
Remarks															
The details of this project are classified SECRET and are submitted annually to Congress in the classified budget justification books.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			28.791	11.650		43.441		44.998		-		44.998	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4								R-1 Program Element (Number/Name) PE 0604027N / Digital Warfare				Project (Number/Name) 3255 / Decision Support Tools and AI Development			

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 3255																												
Increment 1 Minimum Viable Product: Classified																												
Increment 2: Classified																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604027N / Digital Warfare	Project (Number/Name) 3255 / Decision Support Tools and AI Development

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3255				
Increment 1 Minimum Viable Product: Classified	1	2022	4	2022
Increment 2: Classified	1	2022	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604027N / <i>Digital Warfare</i>				Project (Number/Name) 3256 / <i>Warfighting Pilots</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3256: <i>Warfighting Pilots</i>	4.837	3.784	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.621
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification
The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Warfighting Pilots	3.784	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2023 Plans: The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.					
FY 2024 Base Plans: N/A					
FY 2024 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	3.784	0.000	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604027N / Digital Warfare						Project (Number/Name) 3256 / Warfighting Pilots			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Classified	C/CPFF	TBD : Not Specified	4.837	3.784	Dec 2021	0.000		0.000		-		0.000	0.000	8.621	-
Subtotal			4.837	3.784		0.000		0.000		-		0.000	0.000	8.621	N/A
Remarks															
The details of this project are classified SECRET and are submitted annually to Congress in the classified budget justification books.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			4.837	3.784		0.000		0.000		-		0.000	0.000	8.621	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy											Date: March 2023				
Appropriation/Budget Activity						R-1 Program Element (Number/Name)						Project (Number/Name)			
1319 / 4						PE 0604027N / Digital Warfare						3256 / Warfighting Pilots			

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 3256																												
Increment 1 Minimum Viable Product: Classified																												
Increment 2: Classified																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604027N / <i>Digital Warfare</i>	Project (Number/Name) 3256 / <i>Warfighting Pilots</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 3256</i>				
Increment 1 Minimum Viable Product: Classified	1	2022	4	2022
Increment 2: Classified	2	2022	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604027N / <i>Digital Warfare</i>				Project (Number/Name) 3425 / <i>Digital Warfare</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3425: <i>Digital Warfare</i>	56.083	23.418	105.362	101.424	-	101.424	91.464	88.726	89.486	91.298	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: SYSCOM/PEO DW Support	23.418	105.362	101.424	0.000	101.424
Articles:	-	-	-	-	-
Description: The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.					
FY 2023 Plans: The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.					
FY 2024 Base Plans: The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.					
FY 2024 OCO Plans: N/A					
FY 2023 to FY 2024 Increase/Decrease Statement: The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.					
Accomplishments/Planned Programs Subtotals	23.418	105.362	101.424	0.000	101.424

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks**D. Acquisition Strategy**

The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604027N / Digital Warfare				Project (Number/Name) 3425 / Digital Warfare					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Classified	C/CPFF	TBD : Not Specified	56.083	23.418	Dec 2021	105.362	Dec 2022	101.424	Dec 2023	-		101.424	Continuing	Continuing	Continuing
Subtotal			56.083	23.418		105.362		101.424		-		101.424	Continuing	Continuing	N/A
Remarks															
The details of this project are classified SECRET and are submitted annually to Congress in the classified budget justification books.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			56.083	23.418		105.362		101.424		-		101.424	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy										Date: March 2023			
Appropriation/Budget Activity					R-1 Program Element (Number/Name)					Project (Number/Name)			
1319 / 4					PE 0604027N / Digital Warfare					3425 / Digital Warfare			

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 3425																												
Increment 1 Minimum Viable Product: Classified																												
Increment 2: Classified																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604027N / Digital Warfare	Project (Number/Name) 3425 / Digital Warfare	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3425				
Increment 1 Minimum Viable Product: Classified	1	2022	4	2022
Increment 2: Classified	1	2022	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy Date: March 2023

Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	244.182	77.806	88.839	110.506	-	110.506	56.586	50.809	27.103	26.109	Continuing	Continuing
2482: <i>Small Unmanned Undersea Vehicles</i>	4.509	11.006	7.380	8.681	-	8.681	0.533	0.311	0.314	0.321	Continuing	Continuing
2483: <i>Medusa</i>	0.000	1.835	15.583	32.534	-	32.534	11.352	13.537	0.817	0.835	Continuing	Continuing
3123: <i>SMCM UUV</i>	57.792	20.239	19.788	9.025	-	9.025	8.153	4.341	4.309	2.848	Continuing	Continuing
3785: <i>Razorback</i>	22.767	32.687	31.985	37.091	-	37.091	21.861	20.377	9.358	9.546	Continuing	Continuing
4023: <i>Expeditionary Underwater Systems</i>	159.114	12.039	14.103	23.175	-	23.175	14.687	12.243	12.305	12.559	Continuing	Continuing

A. Mission Description and Budget Item Justification

Small and Medium Unmanned Undersea Vehicles (UUVs) are a segment of the Navy's Family of UUVs defined as having a diameter between 3 inches and 10 inches for small UUVs and a diameter of 10 inches to 21 inches for medium UUVs. The UUVs can be launched by submarines, surface ships, or larger UUVs, and can be recovered by surface ships and submarines. This class of UUVs can have one or more types of sensors to perform multiple missions including Intelligence Preparation of the Operational Environment (IPOE), battlespace awareness, and mine warfare.

Small Unmanned Undersea Vehicle program will field a light-weight, highly portable and mission configurable UUV for use by the Navy Explosive Ordnance Disposal (EOD), Naval Special Warfare (NSW), Submarine UUV Squadron (UUVRON), the Naval Oceanographic Community (NMOC), and United States Marine Corps operators. The program will deliver a baseline UUV capability and implement an incremental development approach, including phases for prototyping, integration, demonstration and fielding of Small Diameter UUVs to integrate with mission packages from each community.

Funding supports the development of unmanned systems for the Navy's expeditionary unmanned underwater Explosive Ordnance Disposal (EOD) and Mine Countermeasures (MCM) capability. Specifically, it provides for development of affordable expeditionary, unmanned underwater systems to support Navy Expeditionary forces including EOD, Mobile Diving and Salvage, Underwater Construction Teams (UCT), Very Shallow Water (VSW), and Expeditionary Mine Countermeasures (ExMCM) mission operations. The equipment must be highly portable in order to support the Navy EOD technician to safely approach, render safe, recover, exploit, and dispose of underwater explosive threats to include sea mines, limpet mines, and unexploded ordnance. Provides support for the Navy's high priority missions of Maritime Homeland Defense and MCM, including clandestine reconnaissance and mine clearance in support of amphibious operations. Development of Expeditionary UUV systems to support localization render-safe and detailed intelligence gathering of unexploded ordnance (UXO) including Underwater Improvised Explosive Devices (IEDs). This project directly supports Department of the Navy Unmanned Campaign Framework promulgated in March 2021 and the requirements defined by the Maritime Expeditionary MCM UUV (MEMUUV) CDD and is being executed in accordance with approved CNO N9I Requirement #056-95-19, "Capability Development Document for Maritime Expeditionary Standoff Response Family of Systems," July 23 2019.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604028N I Small/Medium Unmanned Undersea Vehicles	
<p>FY24 will continue the development and testing of advanced technologies that will allow warfighters to detect, classify, and localize high priority threats in meeting mine and undersea warfare missions. Investments will continue in Artificial Intelligence and Machine Learning (AI/ML) technologies, as well as continued improvements in Automated Target Recognition (ATR) algorithms, more advanced autonomy architecture and enhancements to acoustic and electro-optic sensor performance.</p> <p>Surface Mine Countermeasures Unmanned Undersea Vehicle (SMCM UUV) - The Knifefish program develops advanced medium class UUVs to support clandestine mine detection capability against volume, bottom, and buried mines. Equipment includes vehicles and associated systems support equipment. In parallel, Block Upgrade design efforts aligned to Fleet needs are ongoing to support insertion of incremental capability when the technology is ready. Planned Block Upgrade candidates being considered include increased detection range capability, communications upgrades, on-board sonar processing and target recognition, command and control improvements, increased operational depth, and other smaller tasks, as well as future payloads as required.</p> <p>Razorback is a medium class UUV capable of persistent, autonomous, ocean sensing and data collection in support of Navy Intelligence Preparation of the Operational Environment (IPOE) mission. Razorback is deployed from host submarines in two variants: from the Dry Deck Shelter (DDS) or from the torpedo tube. The DDS deployed Razorback variant has been procured beginning in FY17 with Fleet operational deployments beginning in FY21. Development of requirements and submarine integration efforts commenced in FY19 for the torpedo tube launch and recover (TTL&R) variant, which was competitively sourced to industry in FY22.</p> <p>In order to deploy Razorback, or other small or medium class UUVs from a host submarine platform with sufficient endurance to perform a desired mission, high energy density sources such as lithium-ion batteries are used. Consequently, safety is paramount and mitigation systems must be in place to prevent or stop a high energy casualty event. SAFECAP is being developed as an active mitigation strategy that includes a shock qualified capsule that aides in the launch and recovery of small and medium sized vehicles through the torpedo tube. It also contains a Battery Casualty Detection System that constantly monitors battery health and status, providing early warning signs of a battery short via an alarm. In the event of a casualty, the capsule and vehicle portion of SAFECAP are flooded via the fire hose connections and the event is extinguished.</p> <p>MEDUSA is a medium class UUV capable of offensive mining capabilities deployed from a submarine. MEDUSA features torpedo tube launch capability, long range, high payload placement accuracy, and can handle heavy payloads. A demonstration system was developed and tested in FY21 using dummy payloads using a land-based launch facility and surface launched in-water demonstrations. Lessons learned from the demonstration will inform a competitive award to Industry in FY23 to develop and produce tactical prototype systems. The MEDUSA demonstration and Industry prototype variant differ from the Razorback Torpedo Tube Launch and Recovery (TTL&R) variant. MEDUSA is approximately 21 inches in diameter, impulse launched from the torpedo tube, and expendable once the payloads are deployed. Razorback TTL&R is expected to be less than 15 inches in diameter, swim out launch and recover from the torpedo tube, and be capable of swappable payloads to conduct a variety of missions.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0604028N I Small/Medium Unmanned Undersea Vehicles			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	79.947	106.347	82.023	-	82.023
Current President's Budget	77.806	88.839	110.506	-	110.506
Total Adjustments	-2.141	-17.508	28.483	-	28.483
• Congressional General Reductions	-	-0.528			
• Congressional Directed Reductions	-	-16.980			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.141	0.000			
• Program Adjustments	0.000	0.000	31.952	-	31.952
• Rate/Misc Adjustments	0.000	0.000	-3.469	-	-3.469
Change Summary Explanation					
Program Changes:					
Technical: Not applicable.					
Schedule: Not applicable.					
Cost:					
FY 2022: -\$2.141M Small Business Innovative Research					
FY 2023: No Change					
FY 2024: +\$31.515M program adjustments: +\$17.816M Razorback development; +\$4.591M Knifefish development; +\$9.108M Viperfish development; +\$0.822M					
Miscellaneous Adjustments					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles				Project (Number/Name) 2482 / Small Unmanned Undersea Vehicles			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2482: Small Unmanned Undersea Vehicles	4.509	11.006	7.380	8.681	-	8.681	0.533	0.311	0.314	0.321	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

As part of the Expeditionary UUV Family of Systems (FoS) the LIONFISH UUV Program of Record develops advanced SUUVs to support myriad missions across warfare domains. The missions include: expeditionary mine countermeasures, expeditionary data collection and surveillance, and intelligence preparation of the environment (IPOE). Equipment includes vehicles and associated systems support equipment. Planned block upgrades include increased detection range capability, communications upgrades, automated target recognition, cybersecurity, autonomy and command and control improvements, additional launch and recovery abilities, increased operational depth, and payloads as required. FY 2024 supports the completion of follow-on development, test and evaluation, and implementation of cybersecurity solutions to comply with current cyber requirements, leading to full rate production. Additional LIONFISH (SUUV) enhancements to include integration of forward looking sonar and synthetic aperture sonar into the baseline Lionfish architecture will be pursued.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: SMALL UNMANNED UNDERWATER VEHICLES	11.006	7.380	8.681	0.000	8.681
Articles:	-	-	-	-	-
FY 2023 Plans: FY23 efforts include the continued development and integration of cyber security, autonomy, and Automated Target Recognition (ATR) sensors. Increased testing of the SUUV baseline configuration will provide sensor data used for the development of ATR algorithms as well as OQE for future increments. Authority to Operate (ATO) is planned to occur to meet Security Classification Guide (SCG) requirements critical to meeting the multiple warfare communities UUV requirements. Autonomy efforts will include the tuning of autonomous software. Results of these efforts will culminate in production vehicles delivered to the government for government acceptance testing.					
FY 2024 Base Plans: FY24 efforts will focus on initial acceptance testing, delivery, and fielding of production units. Funding will provide additional investments in the transition of advanced technologies as they are critical to the continued development and integration of key capabilities, including improvements in cyber security, autonomy, and					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023							
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles		Project (Number/Name) 2482 / Small Unmanned Undersea Vehicles							
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)				FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total			
Automated Target Recognition (ATR) efforts. These efforts will support test and evaluation to demonstrate operational effectiveness and suitability.											
FY 2024 OCO Plans: N/A											
FY 2023 to FY 2024 Increase/Decrease Statement: Increase from FY 2023 to FY 2024 due to costs associated with production acceptance testing and evaluation of advanced capabilities.											
Accomplishments/Planned Programs Subtotals				11.006	7.380	8.681	0.000	8.681			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• 8128: Lionfish	0.000	18.354	9.494	-	9.494	17.612	16.183	17.861	0.000	0.000	79.504
Remarks											
D. Acquisition Strategy											
The LIONFISH (SUUV) Program is completing its OTA and entering production negotiations under a FAR based contract.											

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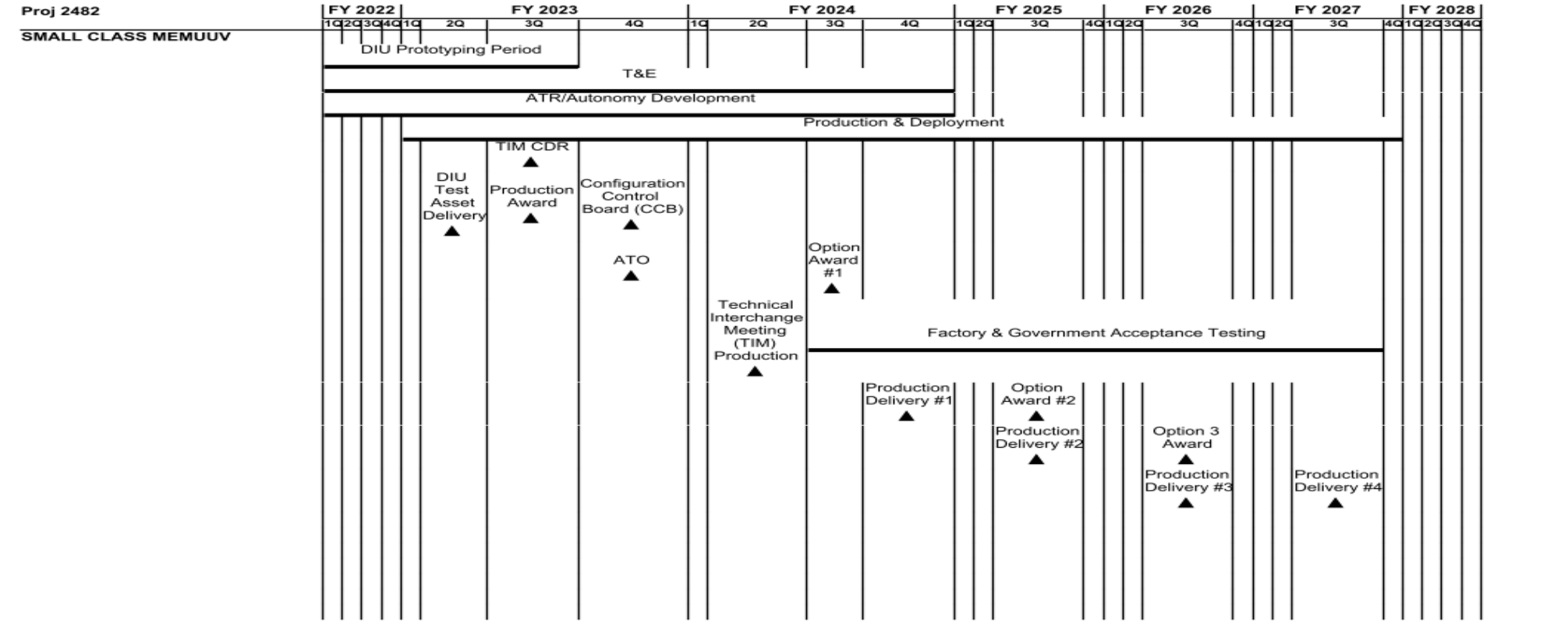
Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles				Project (Number/Name) 2482 / Small Unmanned Undersea Vehicles					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	MIPR	Defense Innovation Unit (DIU) : Mountain View, California	1.892	6.547	Nov 2021	3.048	Nov 2022	3.389	Nov 2023	-		3.389	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	NSWC, Activities : Various	0.490	1.010	Nov 2021	0.726	Nov 2022	0.899	Nov 2023	-		0.899	Continuing	Continuing	Continuing
Subtotal			2.382	7.557		3.774		4.288		-		4.288	Continuing	Continuing	N/A
Remarks FY24 increase is due to engineering changes in cybersecurity architecture.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Support	C/CPFF	Various : TBD	0.144	0.388	Nov 2021	0.184	Nov 2022	0.228	Nov 2023	-		0.228	Continuing	Continuing	Continuing
Subtotal			0.144	0.388		0.184		0.228		-		0.228	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NIWC : San Diego	1.101	1.498	Nov 2021	2.201	Nov 2022	2.545	Nov 2023	-		2.545	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NUWC : Newport	0.766	1.174	Nov 2021	1.034	Nov 2022	1.415	Nov 2023	-		1.415	Continuing	Continuing	Continuing
Subtotal			1.867	2.672		3.235		3.960		-		3.960	Continuing	Continuing	N/A
Remarks FY24 increase is due to engineering changes in cybersecurity architecture.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles				Project (Number/Name) 2482 / Small Unmanned Undersea Vehicles					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NSWCIHEODTD : Indian Head, MD	0.116	0.389	Nov 2021	0.187	Nov 2022	0.205	Nov 2023	-		0.205	Continuing	Continuing	Continuing
Subtotal			0.116	0.389		0.187		0.205		-		0.205	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			4.509	11.006		7.380		8.681		-		8.681	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity		R-1 Program Element (Number/Name)		Project (Number/Name)	
1319 / 4		PE 0604028N / Small/Medium Unmanned Undersea Vehicles		2482 / Small Unmanned Undersea Vehicles	



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604028N / <i>Small/Medium Unmanned Undersea Vehicles</i>	Project (Number/Name) 2482 / <i>Small Unmanned Undersea Vehicles</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2482				
SMALL CLASS MEMUUV: Development and User Testing	1	2022	4	2028
SMALL CLASS MEMUUV: DIU Prototyping Period	1	2022	3	2024
SMALL CLASS MEMUUV: ATR/Autonomy Development	1	2022	4	2028
SMALL CLASS MEMUUV: ECP Initiation	1	2022	1	2022
SMALL CLASS MEMUUV: DIU OTA Option Award	2	2022	2	2022
SMALL CLASS MEMUUV: Cybersecurity Compliance	4	2023	4	2028
SMALL CLASS MEMUUV: RFP Release	1	2023	1	2023
SMALL CLASS MEMUUV: DIU Test Asset Delivery (1-2)	3	2023	3	2023
SMALL CLASS MEMUUV: Production, Deployment & Sustainment	3	2023	4	2028
SMALL CLASS MEMUUV: Factory and Government Acceptance Testing	3	2022	4	2028
SMALL CLASS MEMUUV: ATO	3	2023	3	2023
SMALL CLASS MEMUUV: DIU Test Asset Delivery (3-6)	4	2023	4	2023
SMALL CLASS MEMUUV: Production Award	4	2023	4	2023
SMALL CLASS MEMUUV: PRR Production	3	2024	3	2024
SMALL CLASS MEMUUV: Option Award #1	3	2024	3	2024
SMALL CLASS MEMUUV: Production Delivery #1 (10)	4	2024	4	2024
SMALL CLASS MEMUUV: Production Delivery #2 (5)	2	2025	2	2025
SMALL CLASS MEMUUV: Option Award #2	2	2025	2	2025
SMALL CLASS MEMUUV: Production Delivery #3 (5)	2	2026	2	2026
SMALL CLASS MEMUUV: Option Award #3	3	2026	3	2026
SMALL CLASS MEMUUV: Production Delivery #4 (10)	2	2027	2	2027

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0604028N / Small/Medium Unmanned Undersea Vehicles

Project (Number/Name)

2482 / Small Unmanned Undersea Vehicles

	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
SMALL CLASS MEMUUV: Option Award #4	3	2027	3	2027
SMALL CLASS MEMUUV: Production Delivery #5 (2)	2	2028	2	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles				Project (Number/Name) 2483 / Medusa			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2483: Medusa	0.000	1.835	15.583	32.534	-	32.534	11.352	13.537	0.817	0.835	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
MEDUSA is a medium class UUV capable of offensive mining capabilities deployed from a submarine. MEDUSA features torpedo tube launch capability, long range, high payload placement accuracy, and can handle heavy payloads. A demonstration system was developed and tested in FY21 using dummy payloads using a land-based launch facility and surface launched in-water demonstrations. Lessons learned from the demonstration informed a program start in FY22 and anticipated competitive award to Industry in FY24 to develop and produce tactical prototype systems. The MEDUSA demonstration system and Industry prototype system differ from the Razorback Torpedo Tube Launch and Recovery (TTL&R) variant. MEDUSA is approximately 21 inches in diameter, impulse launched from the torpedo tube, and expendable once the payloads are deployed. Razorback TTL&R is expected to be less than 15 inches in diameter, swim out and launch and recover from the torpedo tube, and be capable of swappable payloads to conduct a variety of missions.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: MEDUSA Product Development Articles: FY 2023 Plans: Release RFP to industry and perform source selection. Initiate submarine integration planning/preparations and safety planning. Initiated submarine combat system integration development. Initiate government risk reduction efforts to address high technical risk areas. FY 2024 Base Plans: Award competitive prototyping contract to industry to design and develop MEDUSA. Initiate and quickly ramp up industry risk reduction efforts on contract and preliminary design activities. Initiate submarine integration planning/preparations and safety planning. Initiate submarine combat system integration development. Continue government risk reduction efforts. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to award of competitive prototyping contract to industry and execution of risk reduction activities and preliminary design efforts under the contract.								1.417	14.281	28.908	0.000	28.908
								-	-	-	-	-
Title: MEDUSA Support								0.250	1.075	3.158	0.000	3.158

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles		Project (Number/Name) 2483 / Medusa		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Articles:		-	-	-	-	-
FY 2023 Plans: Provide acquisition and engineering support for source selection.						
FY 2024 Base Plans: Provide acquisition and engineering support for source selection, contract management activities, and initiate submarine integration efforts, including TEMPALT development and battery certification efforts.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to contract management activities following contract award and initiation of submarine integration efforts.						
Title: MEDUSA Management Services		0.168	0.227	0.468	0.000	0.468
Articles:		-	-	-	-	-
FY 2023 Plans: Provide technical guidance, project planning, program management, financial and contracting management, and travel for contract administration and submarine integration efforts.						
FY 2024 Base Plans: Provide technical guidance, project planning, program management, financial management, and travel for contract administration and submarine integration efforts.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to contracting management activities from contract award.						
Accomplishments/Planned Programs Subtotals		1.835	15.583	32.534	0.000	32.534

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy							Date: March 2023		
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0604028N / <i>Small/Medium Unmanned Undersea Vehicles</i>			Project (Number/Name) 2483 / <i>Medusa</i>		

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPN/1611: <i>Small & Medium UUV (Medusa only)</i>	0.000	0.000	0.000	-	0.000	0.000	8.814	21.931	18.690	Continuing	Continuing

Remarks

The above OPN line item 1611 accounts for several programs. Only the MEDUSA funding is displayed above.

D. Acquisition Strategy

In FY17, development of a single MEDUSA demonstration system was initiated using Navy RDT&E funding to execute a demonstration from a host submarine as a proof of concept. The demonstration system was developed and tested in FY21 using dummy payloads using a land-based launch facility and surface launched in-water demonstrations. Lessons learned from the demonstration informed a UUV program start in FY22. Detailed acquisition planning and requirements generation commenced in FY22, with the target to competitively award a contract to Industry in FY24 for the fabrication of tactical prototype systems.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles				Project (Number/Name) 2483 / Medusa					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MEDUSA Product Development	WR	NSWC PCD : Panama City, FL	0.000	0.944	Apr 2022	6.286	Nov 2022	2.642	Nov 2023	-		2.642	Continuing	Continuing	Continuing
MEDUSA Product Development	WR	NUWC NPT : Newport, RI	0.000	0.314	Apr 2022	5.895	Nov 2022	1.094	Nov 2023	-		1.094	Continuing	Continuing	Continuing
MEDUSA Product Debelopment	WR	Various : Various	0.000	0.159	Apr 2022	2.100	Nov 2022	1.188	Nov 2023	-		1.188	Continuing	Continuing	Continuing
MEDUSA Prototype Contract	C/FPIF	TBD : TBD	0.000	0.000		0.000		23.984	Aug 2024	-		23.984	0.000	23.984	-
Subtotal			0.000	1.417		14.281		28.908		-		28.908	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MEDUSA Engineering Support	WR	NSWC PD : Panama City, FL	0.000	0.125	Apr 2022	0.716	Nov 2022	1.479	Nov 2023	-		1.479	Continuing	Continuing	Continuing
MEDUSA Engineering Support	WR	Various : Various	0.000	0.086	Apr 2022	0.300	Nov 2022	1.061	Nov 2023	-		1.061	Continuing	Continuing	Continuing
MEDUSA Safety Support	WR	NSWC IHD : Indian Head, MD	0.000	0.039	Apr 2022	0.059	Nov 2022	0.618	Nov 2023	-		0.618	0.000	0.716	-
Subtotal			0.000	0.250		1.075		3.158		-		3.158	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MEDUSA Travel	Various	NAVSEA : Washington, DC	0.000	0.010	Apr 2022	0.025	Nov 2022	0.050	Nov 2023	-		0.050	Continuing	Continuing	Continuing
MEDUSA Management	Various	Various : Various	0.000	0.158	Apr 2022	0.202	Nov 2022	0.418	Nov 2023	-		0.418	Continuing	Continuing	Continuing
Subtotal			0.000	0.168		0.227		0.468		-		0.468	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604028N / <i>Small/Medium Unmanned Undersea Vehicles</i>					Project (Number/Name) 2483 / <i>Medusa</i>			
	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	1.835		15.583		32.534		-		32.534	Continuing	Continuing	N/A

Remarks

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PE 0604028N: *Small/Medium Unmanned Undersea Vehicles*
Navy

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R-1 Program Element (Number/Name)
PE 0604028N / <i>Small/Medium Unmanned Undersea Vehicles</i>

Project (Number/Name) 2483 / <i>Medusa</i>
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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles	Project (Number/Name) 2483 / Medusa	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
MEDUSA				
,	1	2022	1	2022
MEDUSA Development: Top Level Requirements (TLR) Development:	1	2022	2	2022
MEDUSA Development: Development Contract: RFP	4	2023	4	2023
MEDUSA Development: Development Contract: Source Selection	4	2023	4	2024
MEDUSA Development: Development Contract: Contract Award	4	2024	4	2024
MEDUSA Development: Development Contract: Preliminary Design Review	4	2025	4	2025
MEDUSA Development: Development Contract: Critical Design Review	4	2026	4	2026
MEDUSA Development: Development Contract: Risk Reduction, Design, Fabricate, and Test	4	2024	4	2028
MEDUSA Development: Submarine Integration: Submarine Integration	4	2025	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles				Project (Number/Name) 3123 / SMCM UUV			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3123: SMCM UUV	57.792	20.239	19.788	9.025	-	9.025	8.153	4.341	4.309	2.848	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
As part of the UUV Family of Systems (FoS) and in support of the Mine Countermeasures (MCM) Mission Package (MP), the Surface Mine Countermeasures Unmanned Undersea Vehicle (SMCM UUV) Program, also referred to as Knifefish, develops advanced medium class UUVs to support clandestine mine detection capability against volume, bottom, and buried mines, in high clutter environments. Equipment includes UUVs and associated system support equipment. The program achieved Milestone C in FY 2019 and entered into Low-Rate Initial Production (LRIP) for five (5) Block 0 systems in FY 2019. The prime contractor for Knifefish is General Dynamics Mission Systems (GDMS) located in Quincy, MA.												
In FY 2021, GDMS was awarded a contract to retrofit the LRIP systems with Block 1 capabilities and upgrade a number of performance characteristics to meet Navy bottom and buried mine hunting requirements. The Navy will conduct a limited validation of these capabilities during system acceptance testing and sell off to the government in Q1-Q2FY24. Upon delivery of these systems to the Navy, they will be available for limited Fleet operations from LCS or Vessels of Opportunity (VOO).												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Knifefish Development								15.057	14.204	9.025	0.000	9.025
								Articles: -	-	-	-	-
FY 2023 Plans: - Complete Block 1 hardware and software development - Conduct data collection in mud bottom type environments to train and tune Post Mission Analysis (PMA) algorithm. - Execute tasking to ensure the Knifefish Block 1 system maintains Cybersecurity compliance - Conduct and complete training and tuning of Block 1 PMA algorithm FY 2024 Base Plans: Knifefish System Acceptance (\$4.0M) - Complete Factory Acceptance Test (FAT) and System Acceptance Test (SAT) for system sell off. - Accept delivery of 5 Knifefish systems - Complete Standard Operating Procedures (SOPs) for maintenance and training. - Complete orderly transition to limited operations and sustainment of delivered Knifefish systems.												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles		Project (Number/Name) 3123 / SMCM UUV		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Establish an Engineering Review Team (ERT) lead by OPNAV N95 and N97 and consisting of subject matter experts (SMEs) to include NAVSEA 05, Fleet, Academia, Warfare Centers, Science and Technology, and Acquisition representatives to (\$5.1M):</p> <ul style="list-style-type: none">- Validate the requirements and mission concept of operations and recommend changes if necessary. This will include a comparison and potential merging of similar Subsea and Seabed Warfare (SSW) requirements, if applicable, to realize cost savings, efficiency, and synergy.- Assess Knifefish system against the requirements to include sensor and platform demonstrated performance, supporting interface systems, and operations.- Capture lessons learned from Knifefish program including testing approaches, automated target recognition applications and challenges, and military utility.- Evaluate new and alternative technologies to address the remaining capability gap- Assess technical maturity, risk, schedule, cost, platform integration options, and potential improvements of alternative solutions.- Evaluate program structure <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Decrease reflects Navy funding reduction in PB24.</p>						
<p>Title: Knifefish Support</p> <p style="text-align: right;">Articles:</p> <p>FY 2023 Plans:</p> <ul style="list-style-type: none">- Preparing mine target fields and provide test support vessels for conduct of data collections in mud environments to train and tune Post Mission Analysis (PMA) algorithm. <p>FY 2024 Base Plans: N/A</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p>		2.805 -	2.514 -	0.000 -	0.000 -	0.000 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy								Date: March 2023			
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles			Project (Number/Name) 3123 / SMCM UUV			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)											
					FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total		
Decrease reflects Navy funding reduction in PB24.											
Title: Knifefish Test and Evaluation					1.527	2.210	0.000	0.000	0.000		
Articles:					-	-	-	-	-		
FY 2023 Plans:											
N/A											
FY 2024 Base Plans:											
N/A											
FY 2024 OCO Plans:											
N/A											
FY 2023 to FY 2024 Increase/Decrease Statement:											
Decrease reflects Navy funding reduction in PB24.											
Title: Knifefish Management Services					0.850	0.860	0.000	0.000	0.000		
Articles:					-	-	-	-	-		
FY 2023 Plans:											
- Execute tasking and prepare artifacts for the basis of authorization to transition the program.											
FY 2024 Base Plans:											
N/A											
FY 2024 OCO Plans:											
N/A											
FY 2023 to FY 2024 Increase/Decrease Statement:											
Decrease reflects Navy funding reduction in PB24.											
Accomplishments/Planned Programs Subtotals					20.239	19.788	9.025	0.000	9.025		
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• OPN/1601: LCS	30.119	92.495	93.961	-	93.961	122.654	103.972	59.906	61.344	1,508.277	2,664.640
MCM Mission Modules											

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy									Date: March 2023		
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles				Project (Number/Name) 3123 / SMCM UUV			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• OPN/1611: Small & Medium UUV	44.534	49.763	61.951	-	61.951	47.916	68.156	107.839	102.724	Continuing	Continuing
Remarks											
OPN 1601 and OPN 1611 funding lines account for several programs, of which the Knifefish program is only a portion.											
D. Acquisition Strategy											
The Knifefish program, initiated in FY11 and competitively sourced to General Dynamics Mission Systems (GDMS), develops Surface Mine Countermeasures Unmanned Undersea Vehicles (SMCM UUVs) equipped with advanced Low Frequency Broadband (LFBB) sonar to provide volume, bottom, and buried mine detection capability, in high clutter environments, when operated from the Littoral Combat Ship (LCS) Mine Countermeasures Mission Package (MCM MP) or Vessel of Opportunity (VOO). An Engineering Development Model (EDM) system was fabricated and tested through Developmental Testing (DT). After incorporating fixes and upgrades discovered during DT and from Fleet operator inputs, an Operational Assessment (OA) was completed from a VOO in order to inform the Milestone C (MS C) decision and Low Rate Initial Production (LRIP) award of five (5) Knifefish systems. Initial integration testing with the LCS was completed prior to MS C. The MS C decision included direction to retrofit Block I changes onto the LRIP Block 0 systems and test, prior to delivery to the Fleet. A Block 1 retrofit contract was awarded in Q3FY21 to develop the Engineering Change Proposals (ECPs) to address additional Block 1 requirements, and to deliver Block 0 to Block 1 retrofit kits for the 5 Block 0 LRIP systems. The Navy will conduct a limited validation of these capabilities during system acceptance testing and sell off to the government in Q1-Q2FY24. Upon delivery of these systems to the Navy, they will be available for limited Fleet operations from LCS or Vessels of Opportunity (VOO)											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles				Project (Number/Name) 3123 / SMCM UUV					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Knifefish Development & Engineering Support	C/CPIF	General Dynamics AIS : McLeansville, NC	10.723	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Knifefish Block 1 Development Contractor	C/CPIF	GDMS : McLeansville, NC	25.259	14.105	Nov 2021	10.452	Nov 2022	4.000	Nov 2023	-		4.000	Continuing	Continuing	Continuing
Knifefish Block 1 Development	C/CPIF	Various : Various	3.427	0.952	Nov 2021	0.971	Nov 2022	2.425	Nov 2023	-		2.425	0.000	7.775	-
LFBB technology improvements	WR	NRL : Washington DC	0.000	0.000		0.781	Nov 2022	0.000		-		0.000	0.000	0.781	-
Knifefish Engineering Review Team	WR	NSWC PC : Panama City, FL	0.000	0.000		0.000		2.600	Nov 2023	-		2.600	0.000	2.600	-
Subtotal			39.409	15.057		12.204		9.025		-		9.025	Continuing	Continuing	N/A
Remarks															
Knifefish program is investigating options for integrating future low frequency broadband technology (e.g. NRL Skyfish) into existing UUVs as an incremental upgrade. Existing technology demonstrators have been shown to physically fit and are expected to be easily integrated as a new payload to current UUVs to provide additional buried minehunting capability.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	WR	NSWC, PC : Panama City, FL	5.449	1.210	Dec 2021	1.734	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Engineering Support	WR	NUWC, Newport : Newport, RI	2.905	0.745	Nov 2021	0.530	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Engineering Support	WR	Various : Various	2.771	0.850	Nov 2021	0.250	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			11.125	2.805		2.514		0.000		-		0.000	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles						Project (Number/Name) 3123 / SMCM UUV			
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	Various : Various	0.412	0.325	Dec 2021	0.850	Dec 2022	0.000		-		0.000	0.000	1.587	-
Operational Test & Evaluation (OT&E)	WR	COMOPTEVFOR : Norfolk, VA	0.930	0.400	Nov 2021	0.408	Nov 2022	0.000		-		0.000	0.000	1.738	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC, PC : Panama City, FL	3.302	0.802	Nov 2021	2.952	Nov 2022	0.000		-		0.000	0.000	7.056	-
Subtotal			4.644	1.527		4.210		0.000		-		0.000	0.000	10.381	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	Various : Washington, DC	2.364	0.800	Dec 2021	0.810	Dec 2022	0.000		-		0.000	0.000	3.974	-
Travel	WR	NAVSEA : WNY, DC	0.250	0.050	Nov 2021	0.050	Nov 2022	0.000		-		0.000	0.000	0.350	-
Subtotal			2.614	0.850		0.860		0.000		-		0.000	0.000	4.324	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			57.792	20.239		19.788		9.025		-		9.025	Continuing	Continuing	N/A
Remarks															

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PE 0604028N: *Small/Medium Unmanned Undersea Vehicles*
Navy

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R-1 Program Element (Number/Name) PE 0604028N / <i>Small/Medium Unmanned Undersea Vehicles</i>
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3123 / SMCM UUV

Knifefish		FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028						
		1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q			
Knifefish Acquisition Program								SAT Ph I and Ph II			SAT PH III																					
Milestones									IPR ◆				Fleet Utilization and Demonstration																			
Test Events				LCS IND MCM MP IOT&E																												
Knifefish Block Upgrade 1																																
		Retrofit Five LRIP Systems to Block 1																														

2024PB - 0604028N - 3123

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604028N / <i>Small/Medium Unmanned Undersea Vehicles</i>	Project (Number/Name) 3123 / <i>SMCM UUV</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Knifefish</i>				
Knifefish Acquisition Program: Fleet Utilization and Demonstration	3	2024	1	2028
Knifefish Acquisition Program: SAT Ph I and Ph II	3	2023	3	2023
Knifefish Acquisition Program: SAT Ph III	1	2024	1	2024
Knifefish Acquisition Program: Milestones: In Progress Review (IPR)	4	2023	4	2023
Knifefish Acquisition Program: Test Events: LCS Independence MCM MP IOT&E	4	2022	4	2022
Knifefish Acquisition Program: Test Events: Block 1 Data Collection	4	2022	3	2023
Knifefish Block Upgrade 1: Retrofit Five LRIP Systems to Block 1	1	2022	1	2024
Knifefish Block Upgrade 1: Deliver Block 1 Retrofits (QTY 5)	2	2024	3	2024
Knifefish Block Upgrade 1: PMA Training and Tuning	3	2023	4	2023
Knifefish Block Upgrade 1: Final PMA HW & SW Integration	4	2023	1	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles				Project (Number/Name) 3785 / Razorback			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3785: Razorback	22.767	32.687	31.985	37.091	-	37.091	21.861	20.377	9.358	9.546	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Project 3785 Razorback realigned from PE 0604218N starting in FY 2020.

Shock and Fire Enclosure Capsule (SAFECAp) is a continuation effort being transferred from PE 0603561N Project 2033 to PE 0604028N Project 3785 beginning FY 2020.

A. Mission Description and Budget Item Justification

A part of the Family of UUVs, Razorback is a medium class UUV capable of persistent, autonomous, ocean sensing and data collection in support of Navy Intelligence Preparation of the Operational Environment (IPOE) mission. Razorback is deployed from host submarines in two variants: from the Dry Deck Shelter (DDS) or from the torpedo tube. The DDS deployed Razorback variant has been procured beginning in FY17 with Fleet operational deployments planned for FY21-FY27. Development of requirements and submarine integration efforts commenced in FY19 for the torpedo tube launch and recover (TTL&R) variant, which was competitively sourced to industry in FY22. Razorback TTL&R leverages risk reduction efforts for torpedo launch and recovery and host submarine integration performed under PE 0604029N UUV Core Technologies.

In order to deploy Razorback or other small or medium class UUVs from a host submarine platform with sufficient endurance to perform a desired mission, high energy density sources such as lithium-ion batteries are used. Consequently, safety is paramount and mitigation systems must be in place to prevent or stop a high energy casualty event. Shock and Fire Enclosure Capsule (SAFECAp) is being developed as an active mitigation strategy that includes a shock qualified capsule that aides in the launch and recovery of small and medium sized UUVs through the torpedo tube, including Razorback. It also contains a Battery Casualty Detection System that constantly monitors battery health and status, providing early warning signs of a battery short. In the event of a casualty, the capsule and vehicle portion of SAFECAp are flooded via fire hose connections and the event is extinguished.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Product Development - Razorback	26.340	21.954	24.926	0.000	24.926
Articles:	-	-	-	-	-
FY 2023 Plans: Complete preliminary design and conduct Preliminary Design Review (PDR). Conduct detailed design and Critical Design Review (CDR). Initiate EDM fabrication. Continue data products development and analysis					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles		Project (Number/Name) 3785 / Razorback		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
for submarine integration including Temporary Alteration (TEMPALT) and Li-ion battery certification efforts. Continue submarine combat system integration development. FY 2024 Base Plans: Complete EDM fabrication. Conduct EDM Contractor Design Verification Testing (DVT). Initiate EDM Government DVT. Continue data products development and analysis for submarine integration including Temporary Alteration (TEMPALT) and Li-ion battery certification efforts. Continue submarine combat system integration development. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: No significant change						
Title: Product Development - SAFECAP Articles:		3.296 -	8.304 -	8.921 -	0.000 -	8.921 -
FY 2023 Plans: Leverage Shock Test Virginia Class VACL. Continue Capsule Production increased levels. FY 2024 Base Plans: Continue integration testing and increased Capsule Production levels. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Increase in FY24 due to Capsule Production efforts.						
Title: Support Articles:		2.198 -	0.832 -	2.332 -	0.000 -	2.332 -
FY 2023 Plans: Provide acquisition and engineering support for contract management activities and submarine integration efforts, including TEMPALT development and technical reviews, and Li-ion battery certification efforts. FY 2024 Base Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy								Date: March 2023				
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles				Project (Number/Name) 3785 / Razorback				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Provide acquisition and engineering support for contract management activities and submarine integration efforts, including TEMPALT development and technical reviews, and Li-ion battery certification efforts. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: No significant change												
Title: Management Services Articles: FY 2023 Plans: Provide technical guidance, project planning, program management, financial and contracting management, and travel for contract administration and submarine integration efforts. FY 2024 Base Plans: Provide technical guidance, project planning, program management, financial and contracting management, and travel for contract administration and submarine integration efforts. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: No significant change								0.853 -	0.895 -	0.912 -	0.000 -	0.912 -
Accomplishments/Planned Programs Subtotals								32.687	31.985	37.091	0.000	37.091
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
• OPN 1611: Small & Medium UUV (Razorback only)	5.725	10.306	16.178	-	16.178	23.533	22.973	38.375	39.193	Continuing	Continuing	
Remarks The above OPN line item 1611 accounts for several programs. Only the RAZORBACK funding is displayed above.												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604028N / <i>Small/Medium Unmanned Undersea Vehicles</i>	Project (Number/Name) 3785 / <i>Razorback</i>
<p>D. Acquisition Strategy</p> <p>The Razorback torpedo tube launch and recover (TTL&R) variant will be a competitively sourced medium class UUV to support missions for the Submarine Force. The Razorback TTL&R acquisition strategy leverages collaboration with the Explosive Ordinance Disposal (EOD) community's Viperfish Maritime Expeditionary Minehunting UUV (MEMUUV) medium class UUV for contracting order quantity, training, and sustainment efficiencies. Razorback TTL&R will leverage lessons learned about mission capabilities and submarine integration from previous science and technology efforts, parallel risk reduction and demonstrations of torpedo tube launch and recovery under UUV Core Technology PE 0604029N, Project 4053 UxS Platform efforts, the Mine Countermeasures Urgent Operational Need (MCM UON), the LBS-AUV systems operated by Naval Oceanographic Command (NAVO), and from the Razorback Dry Deck Shelter variant. Requirements generation and initial submarine integration efforts began in FY19, followed by Request for Proposal (RFP) release to industry in FY20, and an award in FY22 for the Medium UUV contract (for both the Razorback TTL&R and Viperfish). Both the Razorback TTL&R and Viperfish will utilize a Government-designed Forward Section, featuring highly capable sensor, sonar, and communications technologies developed by the University of Texas Applied Research Laboratory. Initial forward sections for testing will be Government furnished, followed by transition to Industry production. SAFECAP development and submarine integration efforts will continue in parallel in order to provide Li-ion battery casualty mitigations to support Razorback vehicles.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0604028N / Small/Medium Unmanned Undersea Vehicles

Project (Number/Name)

3785 / Razorback

Product Development (\$ in Millions)

				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
RAZORBACK Product Development -	WR	NUWC NPT : Newport, RI	4.917	5.605	Nov 2021	1.544	Nov 2022	3.580	Nov 2023	-		3.580	0.000	15.646	-
RAZORBACK EDM Contract	C/CPIF	Leidos : Reston, VA	1.997	8.118	Jul 2022	12.989	Jun 2023	11.433	Nov 2023	-		11.433	0.000	34.537	-
RAZORBACK Product Development	C/CPFF	ARL/UT : Austin, TX	4.276	9.704	Jun 2022	0.757	Nov 2022	3.977	Nov 2023	-		3.977	0.000	18.714	-
RAZORBACK Product Development	WR	Various : Various	0.589	2.913	Nov 2021	6.664	Nov 2022	5.936	Nov 2023	-		5.936	0.000	16.102	-
Product Development - SAFECAP	WR	NUWC NPT : Newport, RI	1.350	0.841	Nov 2021	4.793	Nov 2022	4.335	Nov 2023	-		4.335	Continuing	Continuing	Continuing
Product Development - SAFECAP	C/CPFF	Inventus Power : Woodridge, IL	2.250	0.900	Dec 2021	0.652	Dec 2022	3.260	Dec 2023	-		3.260	Continuing	Continuing	Continuing
Product Development - SAFECAP	WR	NSWC CD : West Bethesda, MD	0.325	0.260	Nov 2021	0.815	Nov 2022	0.168	Nov 2023	-		0.168	Continuing	Continuing	Continuing
Product Development - SAFECAP	WR	NSWC Crane : Crane, Indiana	0.325	0.196	Nov 2021	1.570	Nov 2022	0.184	Nov 2023	-		0.184	Continuing	Continuing	Continuing
Product Development - SAFECAP	C/CPAF	HII Undersea : TBD	0.627	0.369	Dec 2021	0.368	Dec 2022	0.655	Dec 2023	-		0.655	0.000	2.019	-
Product Development - SAFECAP	C/CPAF	HII (Advex) : Norfolk, VA	0.600	0.730	Dec 2021	0.106	Dec 2022	0.319	Dec 2023	-		0.319	0.000	1.755	-
Subtotal			17.256	29.636		30.258		33.847		-		33.847	Continuing	Continuing	N/A

Support (\$ in Millions)

				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support - RAZORBACK	WR	NUWC Newport : Newport, RI	4.350	2.198	Nov 2021	0.832	Nov 2022	2.332	Nov 2023	-		2.332	0.000	9.712	-
Subtotal			4.350	2.198		0.832		2.332		-		2.332	0.000	9.712	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles						Project (Number/Name) 3785 / Razorback			
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Management - SAFECAP	Various	Various : Washington DC	0.293	0.383	Nov 2021	0.395	Nov 2022	0.400	Nov 2023	-		0.400	Continuing	Continuing	Continuing
Travel - RAZORBACK	Various	NAVSEA HQ : Washington DC	0.060	0.070	Nov 2021	0.085	Nov 2022	0.085	Nov 2023	-		0.085	0.000	0.300	-
Management - RAZORBACK	Various	Various : Various	0.808	0.400	Nov 2021	0.415	Nov 2022	0.427	Nov 2023	-		0.427	0.000	2.050	-
Subtotal			1.161	0.853		0.895		0.912		-		0.912	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			22.767	32.687		31.985		37.091		-		37.091	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

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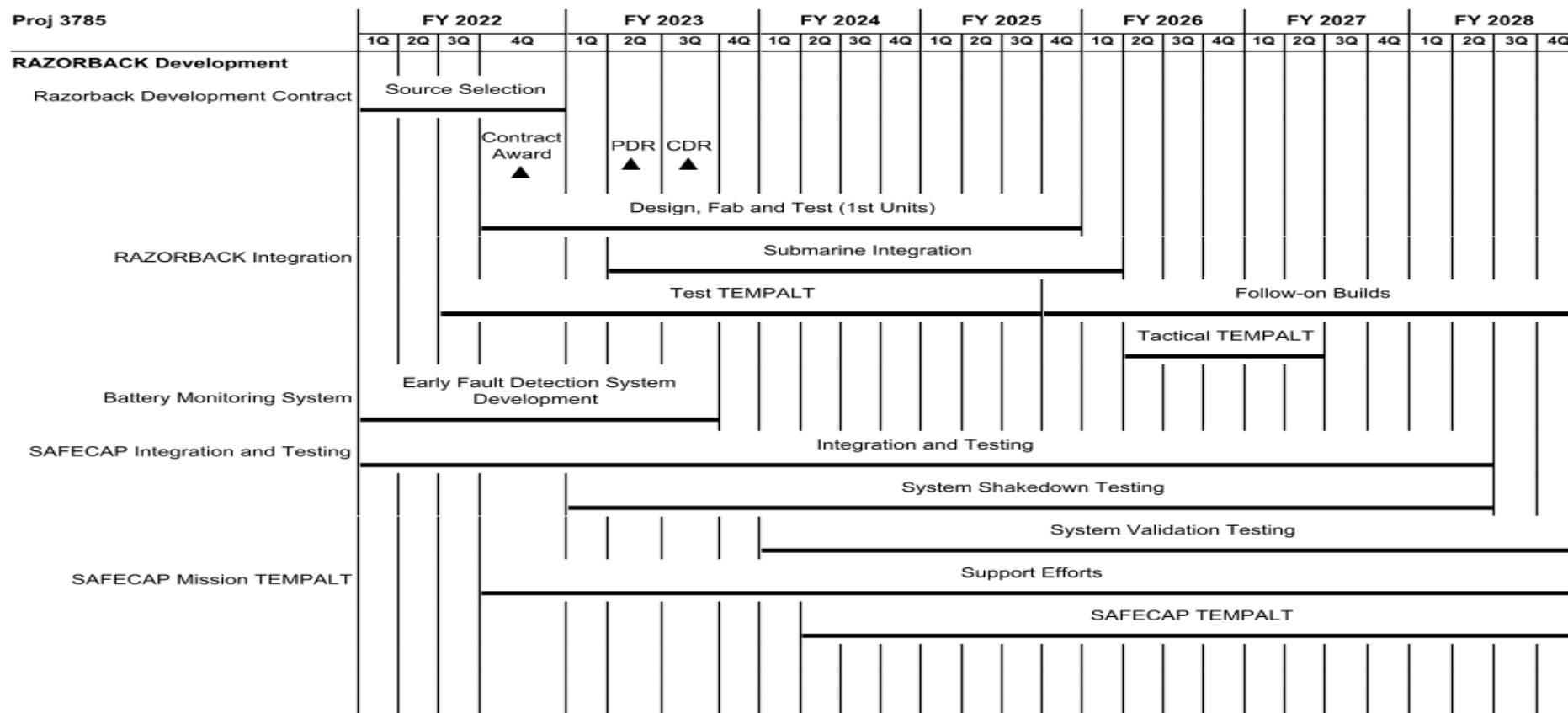
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PE 0604028N / Small/Medium Unmanned

Undersea Vehicles

Project (Number/Name)	Start Date	End Date	Duration (Days)	Team Lead	Status	Progress (%)	Budget (USD)	Actual Cost (USD)	Variance (USD)	Risk Level	Notes
101/Alpha	2023-01-15	2023-03-10	55	John Doe	Completed	100	120000	118000	2000	Low	Exceeded budget by 2000.
102/Beta	2023-02-01	2023-04-15	74	Jane Smith	In Progress	75	150000	155000	-5000	Medium	Minor budget overrun.
103/Gamma	2023-03-01	2023-05-20	79	Mike Johnson	On Hold	30	180000	180000	0	High	Waiting for client approval.
104/Delta	2023-04-01	2023-06-10	70	Sarah Lee	Planned	10	200000	200000	0	Medium	Initial planning phase.
105/Epsilon	2023-05-01	2023-07-15	75	David Kim	Not Started	0	220000	220000	0	Low	Awaiting resources.

3785 / Razorback



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0604028N / Small/Medium Unmanned
Undersea Vehicles

Project (Number/Name)

3785 / Razorback

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3785				
RAZORBACK Development: Razorback Development Contract: Source Selection	1	2022	4	2022
RAZORBACK Development: Razorback Development Contract: Contract Award	4	2022	4	2022
RAZORBACK Development: Razorback Development Contract: Preliminary Design Review	2	2023	2	2023
RAZORBACK Development: Razorback Development Contract: Critical Design Review	3	2023	3	2023
RAZORBACK Development: Razorback Development Contract: Design, Fabricate, and Test	4	2022	4	2025
RAZORBACK Development: RAZORBACK Integration: Submarine Integration	2	2023	1	2026
RAZORBACK Development: RAZORBACK Integration: Follow-on Builds	4	2025	4	2028
RAZORBACK Development: RAZORBACK Integration: Test TEMPALT	3	2022	3	2025
RAZORBACK Development: RAZORBACK Integration: Tactical TEMPALT	2	2026	2	2027
RAZORBACK Development: Battery Monitoring System: Early Fault Detection System Development	1	2022	3	2023
RAZORBACK Development: SAFECAP Integration and Testing: Procurement and Integration	1	2022	2	2028
RAZORBACK Development: SAFECAP Integration and Testing: System Shakedown Testing	1	2023	2	2028
RAZORBACK Development: SAFECAP Integration and Testing: System Validation Testing	1	2024	4	2028
RAZORBACK Development: SAFECAP Mission TEMPALT: TEMPALT Support Efforts	4	2022	4	2028
RAZORBACK Development: SAFECAP Mission TEMPALT: TEMPALT	2	2024	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles				Project (Number/Name) 4023 / Expeditionary Underwater Systems			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
4023: Expeditionary Underwater Systems	159.114	12.039	14.103	23.175	-	23.175	14.687	12.243	12.305	12.559	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funding supports the development of unmanned systems for the Navy's expeditionary unmanned underwater Explosive Ordnance Disposal (EOD) and Mine Countermeasures (MCM) capability. Specifically, it provides for development of affordable expeditionary, unmanned underwater systems to support Navy Expeditionary forces including EOD, Mobile Diving and Salvage, Underwater Construction Teams (UCT), Very Shallow Water (VSW), and Expeditionary Mine Countermeasures (ExMCM) mission operations. The equipment must be highly portable in order to support the Navy EOD technician to safely approach, render safe, recover, exploit, and dispose of underwater explosive threats to include sea mines, limpet mines, and unexploded ordnance. Provides support for the Navy's high priority missions of Maritime Homeland Defense and MCM, including reconnaissance and mine clearance in support of amphibious operations. Development of Expeditionary UUV systems to support localization render-safe and detailed intelligence gathering of unexploded ordnance (UXO) including Underwater Improvised Explosive Devices (IEDs). This project directly supports the requirements defined by the Maritime Expeditionary MCM UUV (MEMUUV) CDD.

MK 18 Mod 2 Increment II upgrade will provide improved Automated Target Recognition (ATR) algorithms, more advanced autonomy architecture and continue to enhance electro-optic sensor performance. Increment II development and testing will focus on improving MCM performance and reducing the tactical timeline through development of a Reacquire, Identify and Mark capability.

Viperfish UUV is an incremental increase in capability from MK18 MOD 2. It will leverage simultaneous volume and bottom mine hunting capabilities, increase endurance from the Mod 2 system, increased depth capability, and will have embedded automated target recognition (ATR).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Expeditionary UUV Family of Systems	12.039	14.103	23.175	0.000	23.175
Articles:	-	-	-	-	-
Description: This program supports MK18 FOS and Viperfish development, testing and Fleet approval for evolving generations of affordable, expeditionary Unmanned Underwater Vehicle (UUVs) systems to address validated requirements in support of Expeditionary SW and VSW UMCM mission areas defined by the Maritime Expeditionary MCM UUV (MEMUUV) Capability Development Document (CDD) approved in September 2017.					
FY 2023 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles		Project (Number/Name) 4023 / Expeditionary Underwater Systems	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>FY23 efforts will conduct System Functionality Review, System Requirements Review, Preliminary Design Review, and Critical Design Review (CDR) leading to fabrication, testing, and integration. FY23 will also complete the development and testing of the MK 18 Mod 2 Increment II leading to achieving Initial Operational Capability (IOC). ATR investments will continue to enable the transition of Artificial Intelligence/Machine Learning (AI/ML) capabilities into fleet systems. Investments in data warehousing and data pipeline development will continue in FY23 leading to more responsive and agile ATR during GPC scenarios.</p> <p>FY 2024 Base Plans: FY24 development of MEMUUVs will focus on maturing technology and continue the transition of mature technology candidates that resulted from ONR investments in Future Naval Capabilities (FNC) programs and collaborative efforts with DIU. The technologies developed and transitioned will enable Viperfish and future increments of MEMUUVs to take full advantage of improved computing power, batteries, and hardware/ software architecture. Test and evaluation events in FY24 will focus on demonstrating performance of Advanced Sensor Packages in operationally realistic environments with significant fleet user engagement. Additionally, environmental and system acceptance testing will commence to demonstrate compliance with the system performance specification requirements. Viperfish FY24 efforts will include the integration of the GFE Front Nose Section, continued testing and evaluation of the MUUV system, continued software development, and Automated Target Recognition development.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to funding required for Viperfish wholeness, development, testing, and technology integration. Increase provides critical government support and oversight to the MUUV contract execution through design and T&E. Increase will provide funding for FY24 events to include: Engineering Development Model fabrication, Test Readiness Review, Contractor-led Design Verification Testing, Quality Assurance testing, Government-led Design Verification Testing, Risk Management Framework steps 3 & 4, initial hazard analysis, Contract Data Requirement List government reviews, and Front Nose Section integration.</p>					
Accomplishments/Planned Programs Subtotals					
	12.039	14.103	23.175	0.000	23.175
C. Other Program Funding Summary (\$ in Millions)					
N/A					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604028N / <i>Small/Medium Unmanned Undersea Vehicles</i>	Project (Number/Name) 4023 / <i>Expeditionary Underwater Systems</i>
C. Other Program Funding Summary (\$ in Millions)		
Remarks		
D. Acquisition Strategy		
<p>Viperfish: A competitive contract was awarded to Leidos in July of 2022 in coordination with PMS 406's Razorback Torpedo Tube Launch & Recovery UUV program. The 10 year contract is broken into 2 phases, design and production. Viperfish design phase began in FY22 and will continue into FY26 (System Requirements Review, System Functionality Review, Preliminary Design Review, Critical Design Review, Design Verification Testing, Quality Assurance Testing, Proof Testing, Production Readiness Review). Future technology exploration will continue through the FYDP to incrementally increase the Viperfish system to meet the needs of the Expeditionary community.</p> <p>MK 18 Legacy: This ongoing program leverages on-going S&T investments by ONR, academia, and industry to transition mature technologies into the Programs of Record to address identified capability gaps. Innovative acquisition approaches, such as the use of User Operational Evaluation System (UOES) strategies, are employed to accelerate the delivery of capability to the Fleet. These approaches provide unique opportunities to engage Fleet operators in tactical experimentation with prototype systems and technologies prior to fielding baseline systems and capability improvement package increments.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles				Project (Number/Name) 4023 / Expeditionary Underwater Systems					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	Various : Various	30.450	2.810	Nov 2021	3.325	Nov 2022	5.855	Nov 2023	-		5.855	Continuing	Continuing	Continuing
Primary Hardware Development	WR	NSWC IH EODTD : Indian, Head, MD	16.238	0.000		0.000		0.000		-		0.000	0.000	16.238	-
Systems Engineering	WR	Various : Various	49.027	3.469	Nov 2021	4.068	Nov 2022	6.698	Nov 2023	-		6.698	Continuing	Continuing	Continuing
Subtotal			95.715	6.279		7.393		12.553		-		12.553	Continuing	Continuing	N/A
Remarks FY24 increase supports design, development, testing, integration, and evaluation of the Viperfish system as a result of POM-24 Viperfish Wholeness investment decisions to properly fund Viperfish Development.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Support	C/CPFF	Various : Various	7.417	0.406	Nov 2021	0.563	Nov 2022	0.925	Nov 2023	-		0.925	Continuing	Continuing	Continuing
Subtotal			7.417	0.406		0.563		0.925		-		0.925	Continuing	Continuing	N/A
Remarks FY24 increase supports design, development, testing, integration, and evaluation of the Viperfish system as a result of POM-24 Viperfish Wholeness investment decisions to properly fund Viperfish Development.															
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	Various : Various	46.477	5.253	Nov 2021	6.022	Nov 2022	9.461	Nov 2023	-		9.461	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NSWC IHEODTD : Indian Head, MD	1.424	0.000	Nov 2021	0.000	Nov 2022	0.000		-		0.000	0.000	1.424	-
Subtotal			47.901	5.253		6.022		9.461		-		9.461	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604028N / <i>Small/Medium Unmanned Undersea Vehicles</i>						Project (Number/Name) 4023 / <i>Expeditionary Underwater Systems</i>			
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks FY24 increase supports design, development, testing, integration, and evaluation of the Viperfish system as a result of POM-24 Viperfish Wholeness investment decisions to properly fund Viperfish Development.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NSWCIHEODTD : Indian Head, MD	5.350	0.000		0.000		0.000		-		0.000	0.000	5.350	-
Miscellaneous	WR	Various : Various	2.713	0.101	Nov 2021	0.125	Nov 2022	0.236	Nov 2023	-		0.236	Continuing	Continuing	Continuing
DAWDF	WR	Not Specified : Not Specified	0.018	0.000		0.000		0.000		-		0.000	0.000	0.018	-
Subtotal			8.081	0.101		0.125		0.236		-		0.236	Continuing	Continuing	N/A
Remarks FY24 increase supports design, development, testing, integration, and evaluation of the Viperfish system as a result of POM-24 Viperfish Wholeness investment decisions to properly fund Viperfish Development.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			159.114	12.039		14.103		23.175		-		23.175	Continuing	Continuing	N/A
Remarks															

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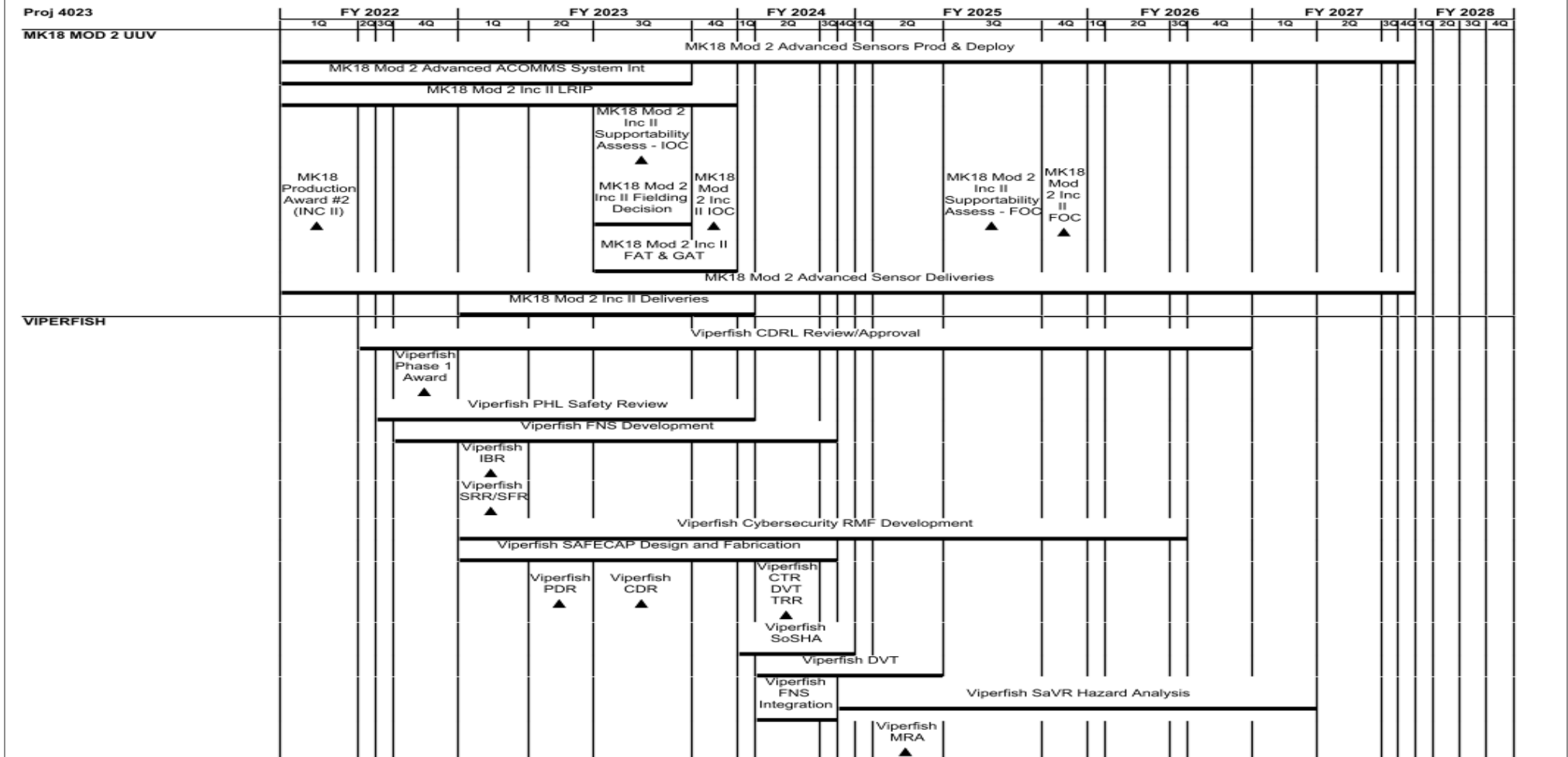
Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0604028N / Small/Medium Unmanned
Undersea Vehicles

Project (Number/Name)
4023 / Expeditionary Underwater Systems



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0604028N / Small/Medium Unmanned
Undersea Vehicles

Project (Number/Name)

4023 / Expeditionary Underwater Systems

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 4023				
MK18 MOD 2 UUV: Production and Deployment (Inc II, Advanced Sensors)	1	2022	4	2027
MK18 MOD 2 UUV: Engineering Change & System Integration (Inc II, Advanced ACOMMS)	1	2022	3	2023
MK18 MOD 2 UUV: Low Rate Initial Production (Inc II)	1	2022	4	2023
MK18 MOD 2 UUV: Supportability Assessment (Inc II) - IOC	3	2023	3	2023
MK18 MOD 2 UUV: Fielding Decision (Inc II)	3	2023	3	2023
MK18 MOD 2 UUV: IOC (Inc II)	4	2023	4	2023
MK18 MOD 2 UUV: Supportability Assessment (Inc II) - FOC	3	2025	3	2025
MK18 MOD 2 UUV: FOC (Inc II)	4	2025	4	2025
MK18 MOD 2 UUV: Production Award #2 (Inc II)	1	2022	1	2022
MK18 MOD 2 UUV: Factory and Government Acceptance Testing (Inc II)	3	2023	4	2023
MK18 MOD 2 UUV: Advanced Sensor Deliveries	1	2022	4	2027
MK18 MOD 2 UUV: Inc II Deliveries	1	2023	1	2024
VIPERFISH: Viperfish (Medium MEMUUV) CDRL Review/Approval	2	2022	4	2026
VIPERFISH: Viperfish (Medium MEMUUV) Phase 1 Award	4	2022	4	2022
VIPERFISH: Viperfish (Medium MEMUUV) PHL Safety Review	3	2022	1	2024
VIPERFISH: Viperfish (Medium MEMUUV) FNS Development	4	2022	3	2024
VIPERFISH: Viperfish (Medium MEMUUV) IBR	1	2023	1	2023
VIPERFISH: Viperfish (Medium MEMUUV) SRR/SFR	1	2023	1	2023
VIPERFISH: Viperfish (Medium MEMUUV) Cybersecurity RMF Development	1	2023	3	2026
VIPERFISH: Viperfish (Medium MEMUUV) SAFECAP Design and Fabrication	1	2023	3	2024

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604028N / Small/Medium Unmanned Undersea Vehicles		Project (Number/Name) 4023 / Expeditionary Underwater Systems	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
VIPERFISH: Viperfish (Medium MEMUUV) PDR		2	2023	2	2023
VIPERFISH: Viperfish (Medium MEMUUV) CDR		3	2023	3	2023
VIPERFISH: Viperfish (Medium MEMUUV) CTR DVT TRR		2	2024	2	2024
VIPERFISH: Viperfish (Medium MEMUUV) SoSHA		1	2024	4	2024
VIPERFISH: Viperfish (Medium MEMUUV) DVT		2	2024	2	2025
VIPERFISH: Viperfish (Medium MEMUUV) FNS Integration		2	2024	3	2024
VIPERFISH: Viperfish (Medium MEMUUV) SaVR Hazard Analysis		4	2024	1	2027
VIPERFISH: Viperfish (Medium MEMUUV) MRA		2	2025	2	2025
VIPERFISH: Viperfish (Medium MEMUUV) SVR/FCA		2	2025	2	2025
VIPERFISH: Viperfish (Medium MEMUUV) Phase 2 Source Selection		2	2025	3	2025
VIPERFISH: Viperfish (Medium MEMUUV) PRR		3	2025	3	2025
VIPERFISH: Viperfish (Medium MEMUUV) Phase 2 Award		3	2025	3	2025
VIPERFISH: Viperfish (Medium MEMUUV) Production Lot 1		3	2025	1	2027
VIPERFISH: Viperfish (Medium MEMUUV) TTL&R		3	2025	1	2026
VIPERFISH: Viperfish (Medium MEMUUV) Production Lot 2		2	2026	3	2027
VIPERFISH: Viperfish (Medium MEMUUV) Prod. FAQT TRR		2	2026	2	2026
VIPERFISH: Viperfish (Medium MEMUUV) ATO Submission		2	2026	1	2027
VIPERFISH: Viperfish (Medium MEMUUV) PCA		4	2026	4	2026
VIPERFISH: Viperfish (Medium MEMUUV) IOC		1	2027	1	2027
VIPERFISH: Viperfish (Medium MEMUUV) ATO Approval		2	2027	2	2027
VIPERFISH: Viperfish (Medium MEMUUV) Production Lot 3		2	2027	3	2028
VIPERFISH: Viperfish (Medium MEMUUV) Production Lot 4		2	2028	4	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604029N / UUV Core Technologies
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	110.367	63.262	59.652	71.156	-	71.156	76.465	68.228	63.967	64.262	Continuing	Continuing
3393: UxS Autonomy, C2	25.001	21.673	27.582	29.708	-	29.708	37.580	32.521	31.819	31.816	Continuing	Continuing
3395: UxS Payloads	29.380	6.631	10.028	13.513	-	13.513	12.100	11.970	9.007	8.878	Continuing	Continuing
3396: UxS Endurance	43.056	14.556	10.960	15.356	-	15.356	17.660	16.081	15.589	15.893	Continuing	Continuing
4053: UxS Platform	12.930	10.755	11.082	12.579	-	12.579	9.125	7.656	7.552	7.675	Continuing	Continuing
9999: Congressional Adds	0.000	9.647	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.647

A. Mission Description and Budget Item Justification

The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	64.860	60.697	67.864	-	67.864
Current President's Budget	63.262	59.652	71.156	-	71.156
Total Adjustments	-1.598	-1.045	3.292	-	3.292
• Congressional General Reductions	-	-1.045			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.598	0.000			
• Program Adjustments	0.000	0.000	6.729	-	6.729
• Rate/Misc Adjustments	0.000	0.000	-3.437	-	-3.437

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604029N / UUV Core Technologies				Project (Number/Name) 3393 / UxS Autonomy, C2			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3393: UxS Autonomy, C2	25.001	21.673	27.582	29.708	-	29.708	37.580	32.521	31.819	31.816	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604029N / UUV Core Technologies				Project (Number/Name) 3395 / UxS Payloads			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3395: UxS Payloads	29.380	6.631	10.028	13.513	-	13.513	12.100	11.970	9.007	8.878	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604029N / UUV Core Technologies				Project (Number/Name) 3396 / UxS Endurance			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3396: UxS Endurance	43.056	14.556	10.960	15.356	-	15.356	17.660	16.081	15.589	15.893	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604029N / UUV Core Technologies				Project (Number/Name) 4053 / UxS Platform			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
4053: UxS Platform	12.930	10.755	11.082	12.579	-	12.579	9.125	7.656	7.552	7.675	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604029N / UUV Core Technologies				Project (Number/Name) 9999 / Congressional Adds			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: Congressional Adds	0.000	9.647	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.647
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Congressional Interest Items not included in other Projects.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	50.580	214.100	-	214.100	0.000	0.000	0.000	0.000	0.000	264.680
0385: Rapid Prototype Development	0.000	0.000	0.000	214.100	-	214.100	0.000	0.000	0.000	0.000	0.000	214.100
2803: Classified #5	0.000	0.000	3.500	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.500
2804: OCTOPUS	0.000	0.000	17.580	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	17.580
2805: GRASP-X	0.000	0.000	3.750	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.750
2806: Classified #1	0.000	0.000	20.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	20.000
2807: Classified #2	0.000	0.000	5.750	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.750

Note

The Navy's Rapid Prototyping, Experimentation and Demonstration (RPED) program with oversight and accountability of projects funded by the DON Accelerated Acquisition Board of Directors (AABoD) concluded in FY21. As a result, Navy did not request FY22 RPED funding. To support the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)), Rapid Defense Experimentation Reserve (RDER) initiative, the projects described herein are the Navy RDER projects, or the Navy's portion of joint service RDER projects, as directed by OUSD(R&E).

A. Mission Description and Budget Item Justification

To facilitate rapid modernization of the force, the RDER initiative was established in the Defense Planning Guidance for Fiscal Year 2023-2027, to encourage multi-component experimentation through a campaign of learning. Services, Agencies, and other participating organizations are to identify "best of breed" capabilities developed among the DoD prototyping programs, and execute approved projects through large-scale experiments in order to refine and/or validate the Joint Warfighting Concept (JWC). Organizations are to nominate proposals to the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) that are multi-component involving Joint Services, International partners and/or other government agencies and link to one or more of the four key supporting concepts ("functional battles") of the Joint Warfighting Concept: Joint Concept for Fires, Joint Concept for Command and Control, Joint Concept for Contested Logistics, and Joint Concept for Information Advantage.

The Department will implement multiple RDER experimentation series through Service nominated projects with execution timelines ranging from one to two years. The USD (R&E) will review project progress, and recommend new projects at least annually with the goal of quickly incorporating the most promising innovative prototypes into experiments, and promptly terminating projects that fail to achieve expectations. To incentivize a disciplined approach to rapidly identify, incorporate, and execute projects largely through the Military Services, the Department will fund approved Service projects for the upcoming fiscal year out of the Department reserves. Funding decisions on additional funds in follow-on years for new projects, and funding decrements for project terminations will be incorporated in budgets annually based on emerging requirements and periodic assessments of project viability. Services will execute these funds under oversight of the OSD in a manner consistent with the experimentation scenario for which individual projects were selected.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem				
Service experimentation outcomes will be designed to validate required capabilities enabling the JWC by evaluating and integrating prototyped technologies in operationally relevant, multi-domain environments. Experimentation results will facilitate Joint Staff analysis in the evaluation of the Joint Warfighting Concept, assist the Joint Requirements Oversight Counsel in requirements determination, and inform the Deputy's Management Action Group to make budget decisions that effect changes throughout the Department.						
Advanced Component Development and Prototypes (ACD&P) efforts necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment are funded in this Program Element (PE). Most of the work in this PE can be classified between Technology Readiness Level (TRL) 6 (system/subsystem model or prototype demonstration in a relevant environment) and TRL 7 (system prototype demonstration in an operational environment).						
B. Program Change Summary (\$ in Millions)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget		0.000	57.000	0.000	-	0.000
Current President's Budget		0.000	50.580	214.100	-	214.100
Total Adjustments		0.000	-6.420	214.100	-	214.100
• Congressional General Reductions		-	-			
• Congressional Directed Reductions		-	-6.420			
• Congressional Rescissions		-	-			
• Congressional Adds		-	-			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-	-			
• Program Adjustments		0.000	0.000	214.100	-	214.100
Change Summary Explanation						
FY24 Funding increase supports selection of 24 Rapid Defense Experimentation Reserve (RDER) initiatives for the Department of Navy (DON).						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem				Project (Number/Name) 0385 / Rapid Prototype Development			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0385: Rapid Prototype Development	0.000	0.000	0.000	214.100	-	214.100	0.000	0.000	0.000	0.000	0.000	214.100
Quantity of RDT&E Articles		-	-	39	-	39	-	-	-	-		

Note

Each planned program contained under project 0385 for FY 2024 will receive the below unique project units for execution to promote acquisition oversight and fiscal clarity of RDER initiatives.

6000 GRANDSTAND
 6001 MARKHOR
 3468 MTC A/X
 2802 MATADOR
 6002 JAW BREAKER
 6003 KRAKEN
 6004 DAWG
 3423 LOCUST
 6005 Maritime Decoy and Deception
 6006 PEGASUS
 6007 MADS
 6008 METEOR
 6009 RLAC
 6010 APEX-AIW
 6011 SPEARHEAD
 6012 SEDNA
 6013 STING
 6014 JTEN
 6015 Cyber SHIELD
 6016 MIM
 6017 DoM
 6018 Osprey
 6019 CoSyCo
 6020 LTAMDS-V

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem		Project (Number/Name) 0385 / Rapid Prototype Development		
A. Mission Description and Budget Item Justification						
To facilitate rapid modernization of the force, the RDER initiative was established in the Defense Planning Guidance for Fiscal Year 2023-2027, to encourage multi-component experimentation through a campaign of learning. Services, Agencies, and other participating organizations are to identify "best of breed" capabilities developed among the DoD prototyping programs and execute approved projects through large-scale experiments in order to refine and/or validate the Joint Warfighting Concept (JWC). Organizations are to nominate proposals to the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) that are multi-component involving Joint Services, International partners and/or other government agencies and link to one or more of the four key supporting concepts ("functional battles") of the Joint Warfighting Concept: Joint Concept for Fires, Joint Concept for Command and Control, Joint Concept for Contested Logistics, and Joint Concept for Information Advantage.						
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: GRANDSTAND		0.000	0.000	10.600	0.000	10.600
Articles:		-	-	-	-	-
Description: Project GRANDSTAND will provide Indications and Warnings (I&W) of adversary communications. Provide warning of impending fires and targeting solutions for potential kinetic solution. Please refer to Top Secret//Sensitive Compartmented Information (TS//SCI) Supplement for more details.						
FY 2023 Plans:						
N/A						
FY 2024 Base Plans:						
Please refer to Top Secret//Sensitive Compartmented Information (TS//SCI) Supplement for more details.						
FY 2024 OCO Plans:						
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement:						
FY 2024 funding increase reflects selection of GRANDSTAND as a RDER initiative.						
Title: MARKHOR		0.000	0.000	17.000	0.000	17.000
Articles:		-	-	-	-	-
Description: Project MARKHOR will build and experiment on a single threat of interest to the INDOPACOM theatre. Please refer to Top Secret//Sensitive Compartmented Information (TS//SCI) Supplement for more details.						
FY 2023 Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem		Project (Number/Name) 0385 / Rapid Prototype Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
FY 2024 Base Plans: Please refer to Top Secret//Sensitive Compartmented Information (TS//SCI) Supplement for more details						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of MARKHOR as a RDER initiative.						
Title: MTC A/X		0.000	0.000	5.000	0.000	5.000
Articles:		-	-	-	-	-
Description: The details of this project are classified SECRET and are submitted annually to Congress in the classified budget justification books.						
FY 2023 Plans: N/A						
FY 2024 Base Plans: The details of this project are classified SECRET and are submitted annually to Congress in the classified budget justification books.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of MTC-A/X as a RDER initiative.						
Title: MATADOR		0.000	0.000	4.500	0.000	4.500
Articles:		-	-	-	-	-
Description: MATADOR will improve upon existing Over The Horizon Radar (OTHR) systems by utilizing known reference points (Targets of Opportunity) to enhance the current target registration. This in turn will increase accuracy on targets of which no information is known. This project will leverage existing contract agreement with WR Systems as well as on-site labor by Naval Research Laboratory to develop the software required to achieve this goal.						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem		Project (Number/Name) 0385 / Rapid Prototype Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
PRJ 2802-MATADOR, is a new start for FY 2024.						
FY 2023 Plans: N/A						
FY 2024 Base Plans: This project will begin with a period of software development to improve existing MASOR OTHR radar systems to enhance current targeting capabilities by implementing an improved coordination system. After the initial development, an initial data collection and experimentation phase shall occur. The results of the data collection and experimentation shall be used to test the overall software package before final delivery to the OTHR Program Office.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of MATADOR as a RDER initiative.						
Title: JAW BREAKER		0.000	0.000	9.800	0.000	9.800
Articles: Description: PRJ 6002- JAW BREAKER is a not a new start for FY2024. JAW BREAKER is tied to the Tactical Edge Targeting (TET) program in PE 0304785N, PU 3786.		-	-	-	-	-
Project JAW BREAKER supports long-range fires of interest to INDOPACOM. Additional details held at a higher classification.						
FY 2023 Plans: N/A						
FY 2024 Base Plans: FY 2024 JAW BREAKER funds will accelerate development and integration efforts to demonstrate federation of Tactical Edge Targeting (TET) capabilities to key Fleets, Combatant Commands, and Coalition partners; thereby adding scale, capacity, and resiliency to JOINT/COMBINED tracking and targeting architectures. Additional details held at a higher classification.						
FY 2024 OCO Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem		Project (Number/Name) 0385 / Rapid Prototype Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of JAW BREAKER as a RDER initiative.						
Title: KRAKEN Articles: Description: The details of this project are classified SECRET and are submitted annually to Congress in the classified budget justification books. FY 2023 Plans: N/A FY 2024 Base Plans: The details of this project are classified SECRET and are submitted annually to Congress in the classified budget justification books. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of KRAKEN as a RDER initiative.		0.000 -	0.000 -	10.000 -	0.000 -	10.000 -
Title: DAWG Articles: Description: The details of this project are classified Top Secret//Sensitive Compartmented Information (TS//SCI) and are submitted annually to Congress in the classified budget justification books. FY 2023 Plans: N/A FY 2024 Base Plans: The details of this project are classified Top Secret//Sensitive Compartmented Information (TS//SCI) and are submitted annually to Congress in the classified budget justification books. FY 2024 OCO Plans:		0.000 -	0.000 -	1.800 -	0.000 -	1.800 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem		Project (Number/Name) 0385 / Rapid Prototype Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of DAWG as a RDER initiative.						
Title: LOCUST		0.000	0.000	10.000	0.000	10.000
Articles:		-	-	36	-	36
Description: LOCUST will provide ISR and precision loitering munitions capable of being launched from air, surface, ground, and sub-surface platforms to conduct both singular and swarm operations across battlespace in conjunction with Joint and manned operations. It will demonstrate multi-domain launch and strike operations, heterogeneous air platform payloads, unmanned from unmanned operations, distributed control of the strike mission, and refined cost elements for critical technologies that have supply chain assurance addressed.						
This effort is not a new start continuing efforts from the LOCUST Innovative Naval Prototype (INP) under the Office of Naval Research (ONR). LOCUST is transitioning to a program office to support combatant commander requirements, PE 0604230N, PU 1130 Expeditionary Loitering Munitions Capability Development (GOALKEEPER) under Naval Sea System Command (NAVSEA)						
FY 2023 Plans: N/A						
FY 2024 Base Plans: Procures 36 All up Rounds (AUR) for operational test assets in support of GOALKEEPER test schedule.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of LOCUST as a RDER initiative.						
Title: Maritime Decoy and Deception		0.000	0.000	5.600	0.000	5.600
Articles:		-	-	-	-	-
Description: Maritime Decoy and Deception will incorporate NSWC Crane Loki Payloads into Wave Glider and Ocean Aero autonomous UAVs to perform missions of interest to USINDOPACOM. This project will leverage several COTS and GOTS hardware/software packages for final integration and testing at Northern Edge 25.						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem		Project (Number/Name) 0385 / Rapid Prototype Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
PRJ 6005-Maritime Decoy and Deception, is a new start for FY 2024.						
FY 2023 Plans: N/A						
FY 2024 Base Plans: This project will begin by developing Computer Aided Design (CAD) models of both payloads and autonomous vehicles for integration. M&S capabilities will be utilized to develop a Live Virtual Constructive (LVC) environment for simulating the integrated technology. As a milestone event, integrated technology will be demonstrated at Northern Edge 25.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of Maritime Decoy and Deception as a RDER initiative.						
Title: PEGASUS		0.000	0.000	3.410	0.000	3.410
Articles:		-	-	-	-	-
Description: This C5ISR-T project will explore specific frequency measurements of Department of Navy (DoN) and/or other Service rotorcraft, tilt-rotor and fixed wing aircraft, evaluate the transition of Naval shipboard capabilities to those aircraft including the production of prototype HW and SW algorithms that may be aircraft category or type, model series (TMS) unique. Modelling and development of new Simultaneous Transmit and Receive (STaR) antenna apertures will be explored and prototyped/ integrated onto DoN or DoD representative platforms for flight testing and performance assessments. While testing may be focused on DoN platforms, testing may be conducted on any DoD platform and will be applicable and transferable to all Tri-Service rotorcraft and tilt-rotor platforms.						
This effort is not a new start as C5ISR-T (PEGASUS) received additional funding (\$2.4M) in FY23 from USMC Future Vertical Lift and (\$0.3M) from OUSD (A&S) to move capability assessments left.						
FY 2023 Plans: N/A						
FY 2024 Base Plans: Finalize specific frequency collection/ analysis						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem		Project (Number/Name) 0385 / Rapid Prototype Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Develop requirements for aircraft incorporation of DoN Shipboard capability Initiate rotor craft unique SW algorithm and assess requirement for TMS vice aircraft classification algorithm Initiate prototype hardware matched to rotorcraft SWaP Continue analysis/development of STaR antenna options and evaluate against option for individual transmit and receive antennas Flight test on DoN or DoD representative rotorcraft utilizing DoN Shipboard HW and rotorcraft unique SW algorithms Provide reports/presentations associated with project progress (successes and challenges) to stakeholders FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of Pegasus as a RDER initiative.						
Title: MADS Articles: Description: Multi-domain Area Denial from Small-USV (MADS) integrates the fielded FIM-92 Stinger weapons launchers and necessary targeting and fire controls on a high-TRL Navy-funded small USV (SUSV) to provide a low-cost, persistent anti-air and anti-surface maritime defense capability. MADS is intended to be scaled to "n" number of systems where multiple systems deployed simultaneously will overwhelm enemy kill chains as well as be difficult and costly to target. The resulting capability would be unmatched in terms of size, endurance, and cost and is suitable for littoral, chokepoint, and EABO operations, and organic stand-off defense for manned naval vessels such as MSC ships of USTRANSCOM. The experimentation will integrate existing weapons, platform, targeting, fire control and C2 systems into a new CONOP and validate performance and operational utility of stand-off weapons employed from low-cost SUSVs through Live-fire engagement of target drones and small boats. Peer or near peer competitors are building naval forces that will soon be significantly more numerous than those of the US Navy and our allies. During future conflicts, US and allied forces will be greatly outnumbered by peer or near peer competitors in both tactical platforms and munitions. To counter this threat, Distributed Maritime Operations (DMO) are planned that will require large numbers of smaller tactical platforms including unmanned surface vessels (USVs). Large numbers of small, low signature, attributable unmanned missile launching vessels have the potential to improve surface force magazine depth and reduce risk to force in denied areas. Small-USV		0.000 -	0.000 -	5.000 -	0.000 -	5.000 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem		Project (Number/Name) 0385 / Rapid Prototype Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
(GARC) launched surface-to-air missiles (Stinger) neutralize low-altitude red aircraft and provide blue forces with the freedom of maneuver to conduct myriad missions.						
PRJ 6007- MADS, is a new start for FY 2024						
FY 2023 Plans: N/A						
FY 2024 Base Plans: The experiment will consist of a single sensor/shooter platform conducting Live-fire engagements against air target drones to validate the hypothesis that low cost, attributable, small USVs with integrated weapons offer a capable stand-off area denial system. The integrated capability of the system to accomplish the sensor/shooter roles from a single platform and test the datalink architecture required for human-on-the-loop fire control will be proven out. Initial technical feasibility will be established early through a number of land-based smaller system integration and experimentation efforts. The experimentation will develop and validate CONOPS and TTP for employment of MADS. Modeling and simulation, such as Table Top Exercise (TTX) wargaming, will be used to close-in and/or refine architectural frameworks in support of USN and USMC joint operations. The TTX and real-world experimentation results will inform refinement of CONOPS and CONEMP for scaling the capability to large-n number of platforms.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of MADS as a RDER initiative.						
Title: METEOR		0.000	0.000	1.590	0.000	1.590
Articles:		-	-	-	-	-
Description: Currently, the Joint Force suffers from a lack of redundant, resilient hard kill/soft kill options against stressing stream raid threats of Anti-Ship Ballistic Missiles (ASBM). The issue is particularly acute in the USINDOPACOM AOR due to the vast geographic distances involved, ship magazine size and adversary actions. Without additional hard kill/soft kill options preserving magazine depth, US forces in the AOR face unacceptably high risks to the mission and to the force. Available assets in the AOR are limited with a limited number of missile inventory. HPM payload capability will solve this problem by supplementing and conserving the ships kinetic defensive weapons. HPM Acceleration will also develop novel Radio Frequency waveforms						

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Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem		Project (Number/Name) 0385 / Rapid Prototype Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
to improve HPM effectiveness. When combined with other non-kinetic capabilities and integrated with the ship's command and control (C2), the program will provide a low cost-per-shot, deep magazine capability for significantly expanding the self-defense capabilities of afloat and ashore platforms. Rapid engagement of targets for large threat raid defeat is a major feature of the system. The system will demonstrate full kill chain integration from find to assess. The payoffs for the program include integrated non-kinetic air defense systems to improve the layered defense, optimized use of defensive kinetic weapons and improved sensor and control systems. PRJ 6008-METEOR, is a new start in FY 2024. FY 2023 Plans: N/A FY 2024 Base Plans: The program will begin development by leveraging ONR's ongoing technology maturation projects for pulsed power driver, energy magazine, embedded controls and weapon console. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of METEOR as a RDER initiative.						
Title: RLAC <div>Articles:</div> Description: Rapid Large Area Clearance for EOD Missions (RLAC) will develop new tools and equipment for EOD technicians. RLAC will decrease the unexploded ordnance (UxO) clearance timeline for bases and ports by using a distributed networked system of (2) person portable unmanned capabilities, advanced sensors, automated target recognition, directed energy, and standoff technologies. Additionally, cooperative autonomy developed under this program will reduce human cognitive loads and improve human/machine teaming. PRJ 6009-RLAC, is a new start for FY 2024. FY 2023 Plans: N/A FY 2024 Base Plans:		0.000 -	0.000 -	10.200 -	0.000 -	10.200 -

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Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem		Project (Number/Name) 0385 / Rapid Prototype Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Phase 1 of this project includes building, integrating, and testing small UAS and ATR algorithms against potential UxO items. UGV Cooperative Autonomy, Target Recognition, and Deep Detection algorithms will be developed. Standoff neutralization of submunitions and testing of individual capabilities will occur at the end of the FY. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of RLAC as a RDER initiative.						
Title: APEX-AIW Articles: Description: Allied & Partnered/Expeditionary Asymmetric Industrial Warfare (APEX-AIW) will augment organic Additive/Advanced Manufacturing (AM) capability that resides within our Expeditionary forces, Allies, and Partners with a large-format Foundry Operational Prototype. This project will provide a digital design eco-system for Joint Warfighter and Allies and Partners to manufacture vessels, structures, and parts in theatre. APEX-AIW will exercise the Foundry through a series of builds to demonstrate military utility via the production of useful prototypes in relevant quantities, including Littoral Maneuver Piers, Low-Profile Vessels, Quick Reaction Small USVs, and Allied and Partner replacement parts. This project leverages technology developed under the Manufacturing Autonomous System at Scale (MASS) Innovative Naval Prototype (INP) effort at ONR. FY 2023 Plans: N/A FY 2024 Base Plans: Work in FY24 is broken into 3 tasks: Task 1: Foundry Design Tool sizing to meet product size and build rate Tooling final Design Hardware for Advanced Manufacturing Task 2: Littoral Maneuver Pier System Integration Stakeholders User Requirement/Use Case for Demo System analysis and requirements		0.000 -	0.000 -	10.100 -	0.000 -	10.100 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem		Project (Number/Name) 0385 / Rapid Prototype Development	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Inflatable Causeway Design Modifications AIW Dock Conceptual Design Task 3: Small USV Concept Design (White Team) Component/module identify (e.g. propulsion, autonomy kit) Manufacturing support from foundry FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of APEX-AIW as a RDER initiative.					
Title: SPEARHEAD Articles: Description: SPEARHEAD is a multicomponent fuel management system, driven by AI/ML models, that supports distributed fuel operations for survivability and enhanced logistics. This project will utilize existing fuel monitoring systems to develop a robust logistics pipeline for increased visibility into fuel delivery and status throughout an AOR and permit strategic fuel placement and prepositioning for force projection. FY 2023 Plans: N/A FY 2024 Base Plans: Phase 1 efforts include initial integration of SPEARHEAD system software and performing a proof-of-concept demonstration. Also, a preliminary design review will take place and go/no go decisions will determine way ahead. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of SPEARHEAD as a RDER initiative.	0.000 -	0.000 -	9.000 -	0.000 -	9.000 -
Title: SEDNA Articles:	0.000 -	0.000 -	10.000 -	0.000 -	10.000 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem		Project (Number/Name) 0385 / Rapid Prototype Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Description: The details of this project are classified SECRET and are submitted annually to Congress in the classified budget justification books.</p> <p>FY 2023 Plans: N/A</p> <p>FY 2024 Base Plans: The details of this project are classified SECRET and are submitted annually to Congress in the classified budget justification books.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of SEDNA as a RDER initiative.</p>						
<p>Title: STtNG</p> <p style="text-align: right;">Articles:</p> <p>Description: Satellite Terminal (transportable) Non-Geostationary (STtNG) is a militarized terminal and common interface system to access Non-Geostationary Satellite Orbits (NGSO) Proliferated Low/Medium/High Earth Orbit (PLEO/MEO/HEO) constellations. STtNG will enhance resilient communications in support of long-range fires. STtNG augments the CBSP family of terminals, taking advantage of additional commercial space segments, to provide a simultaneous multiband failover capability to current MIL/COMSATCOM systems. STtNG falls under the CBSP CPD dated 27 Apr 2009 and has been validated by Fleet war gaming exercises. STtNG supports the Naval Operational Architecture (NOA) by adding satellite frequency diversity through a transportable system which will support current and future modems.</p> <p>Satellite Terminal (transportable) Non-Geostationary (STtNG) is a not a new start for FY 2024. STtNG is a subvariant of CBSP. STtNG efforts are currently being funded under PE 0604280N, PRJ C887 (FY23 Congressional Add), and the FY 2024 funding is an extension of the efforts.</p> <p>FY 2023 Plans: N/A</p> <p>FY 2024 Base Plans:</p>		0.000 -	0.000 -	8.300 2	0.000 -	8.300 2

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem		Project (Number/Name) 0385 / Rapid Prototype Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Phase one includes design and initial prototyping of mobile, tactical edge node systems, and Common Submarine Radio Room (CSRR) variants including software/hardware development, integration and laboratory testing. Once developed, the program will test connectivity of procured prototypes, which will be measured and studied for best performance. Submarine antennas will utilize Luneberg Lens technology. Inc 3 brings enhanced capabilities including: Assured PNT, S-band connectivity, and special mode connectivity. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of STtNG as a RDER initiative.						
Title: JTEN Articles: Description: The Joint Tactical Edge Network (JTEN) is an overlay network and data architecture for tactical communications systems helps enable information sharing across dissimilar communications and datalinks. JTEN's approach is to build the network by leveraging technology from the Service efforts that have already been established with the end goal being a leave-behind hardware agnostic capability that enables the Joint Warfighter to share relevant data across domains. This budget requirement provides resources to integrate each of the Service projects into JTEN, and conduct an experiment during a major Joint force exercise evaluating JTEN's use to close specific long range kill chains in the USINDOPACOM AOR. The intent is to leverage ongoing Navy, Air Force and Army JADC2-related projects to provide the opportunity to share time-critical data across the joint tactical grid created through JTEN. An investment by the RDER program will enable the critical activities of integrating the Service solutions to provide Joint interoperability. Specifically, the RDER funds will be used to conduct live-fly demonstrations, extensive high-fidelity virtual constructive modeling and military utility assessments that will yield data in support of a commitment by each service to a production and fielding decision of JTEN to the operating forces. This effort is not a new start and builds upon FY22 and FY23 JADC2 efforts. FY 2023 Plans: N/A FY 2024 Base Plans:		0.000 -	0.000 -	15.100 -	0.000 -	15.100 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem		Project (Number/Name) 0385 / Rapid Prototype Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Funding will be used to conduct a joint service field experiment either at White Sands Missile Range or a pre-established operational exercise such as Trident Warrior 24. To get to this milestone, the services will develop joint architecture to provide a guideline for subsequent development, integration, and test activities. This will include development of the necessary system interfaces to allow integration of these technologies for experimentation and eventual operational use. Exploratory integration and test will be conducted to assist in identify the necessary interfaces. In FY24, we planned Live-Virtual-Constructive simulations of JTEN systems-of-systems architecture in order to identify and resolve technical issues in order to reduce risks during our field experimentation. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of JTEN as a RDER initiative.						
Title: Cyber SHIELD Articles: Description: Cyber Systems Hardening of Infrastructure to Ensure Land-based Defense (Cyber SHIELD) is a follow on to the MOSAICS Joint Capabilities Technology Demonstration (JCTD) project which developed and demonstrated cyber defensive capabilities for USINDOPACOM critical infrastructure control systems (electrical, natural gas, water). Cyber SHIELD will continue to build upon work demonstrated by the MOSAICS JCTD for cyber defensive capabilities. PRJ 6015-Cyber SHIELD, is a new start for FY 2024. FY 2023 Plans: N/A FY 2024 Base Plans: Efforts will support the application and validation of the MOSAICS foundation for a cyber resilient capability and extensibility to a new infrastructure domain (e.g., water). Additionally, demonstrate the level of resilience improvement of incorporating automated technologies, such as Software Defined Networking (SDN), to reduce the time to mitigated response. Cyber security for control system critical infrastructure is necessary for the DOD to provide combat-credible mission readiness to deter war and protect the nation's safety.		0.000 -	0.000 -	6.900 -	0.000 -	6.900 -

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Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem	Project (Number/Name) 0385 / Rapid Prototype Development			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
-Spiral 0. Primary Objectives: Develop, deploy, integrate, and test enhanced capability based on the MOSAICS JCTD MUA demonstration and OT SDN technology in lab testbeds. Examine automated build, configuration, and deployment capabilities.						
-Spiral 1. Primary Objectives: Complete evaluation of alternate technologies; Integrate OT SDN data into architecture for network alerting; Integrate OT SDN control to support fine-grained mitigations; Develop extended mitigations playbook(s); Finalize automated build and deployment approach.						
-Spiral 2. Primary Objectives: Perform Guam site survey; Integrate alternate COTS technologies selected for Baselining, Alerting, and Visualization; Complete development of automated failover and recovery playbooks to improve resiliency; Integrate PLC technologies into architecture for improved resiliency.						
-Spiral 3. Primary Objectives: Transition integrity checking to a Windows/Unix service implementation; Begin transition of orchestration playbooks; Extend Information Sharing architecture to support situational awareness requirements; Perform second Guam site survey; Build automated deployment packages(s).						
-Spiral 4. Primary Objectives: Deploy all virtual images and capabilities to Guam facility; Integrate with Guam control system environment; Perform end-to-end functional test; Back fit images to Naval pilot deployment.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of Cyber SHIELD as a RDER initiative.						
Title: MIM		0.000	0.000	6.700	0.000	6.700
Articles:		-	-	3	-	3
Description: The Rapidly Fieldable Moored Influence Mine (MIM) project seeks to augment the fielded bottom mine (Quick Strike, CDM) with moored systems and reestablish a surface launch capability. This prototyping effort will develop novel methods of mine deployment and incorporate technical advancements in mining technology while leveraging legacy hardware designs and concepts from demilitarized moored mines.						
PRJ 6016-MIM, is a new start for FY 2024.						

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
FY 2023 Plans: N/A						
FY 2024 Base Plans: -Develop Moored Influence Mine (MIM) system -Modify launcher prototype for use with MIM -Commence fabrication of three MIM prototypes and one MIM launcher prototype						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of MIM as a RDER initiative.						
Title: DoM		0.000	0.000	3.500	0.000	3.500
Articles:		-	-	-	-	-
Description: Data on the Move (DoM) will test and evaluate emerging operational level-of-war planning (days to 30+ days) to assist Joint Force Maritime Component Command staff's ability to generate what if courses of actions to understand the relationship between fires, contested logistics, and maneuver for joint maritime forces. This combined Operations and Logistics planner schedules high-volume multi-domain fires, including heterogeneous salvos, against defended targets while accounting for contested logistics to support that Operations plan. That is, do we have enough stuff for the operational duration, and can we get it there in time?						
In FY 2023 Q2, MARFORPAC and COMPACFLT used DoM planning software to support Logisitics Rehearsal of Concept event to help generate class 5 (ammunition) requirements for a future engagement. They intend to use Dreamcatcher for the next four LOG ROCs to help define requirements for Class of Supplies IV (fortification materials), III (fuel), I (food), and VIII (medical).						
To reduce risk of DoM RDER's FY 2024 fleet evaluation exercises, ONR in partnership with C7F, C3F, I MEF, 3d MLR, COMSUBPAC, COMPACFLT, MARFORPAC, and OPNAV N4 will evaluate DoM software for a simulated stressing INDOPACOM engagement in October 2023 at Oahu. The October evaluation will identify areas that need to be corrected before the RDER 24-2 FY 2024 fleet evaluation exercise.						
PRJ 6017-DoM, is not a new start for FY 2024.						

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Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem		Project (Number/Name) 0385 / Rapid Prototype Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
FY 2023 Plans: N/A						
FY 2024 Base Plans: Task 1 - Integrate and deploy DoM planning software to RDER FY24-2's FY24 fleet testing event (e.g., Valient Shield 24). DoM funding will allow Joint Force Maritime Component Command, Maritime Operations Centers, and Marine Expeditionary Force staffs to access DoM planning software from their SIPR watch stations. Task 2 - develop DoM user and training guides to FY24 test event. Task 3 - revise planning software based on fleet feedback from October 2023 test event at Oahu. Task 4 - participate in RDER FY24-2's FY24 fleet test event planning conferences to ensure DoM software accounts for joint needs						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of DoM as a RDER initiative.						
Title: Osprey Articles:		0.000 -	0.000 -	20.000 -	0.000 -	20.000 -
Description: The Osprey program explores advanced anti-surface warfare (ASuW) and antisubmarine warfare (ASW) weapons concepts. The Osprey program will conduct detailed design, risk reduction, and development of the weapons concepts culminating in final demonstrations against representative targets. Osprey will continue work funded by DARPA in the area of ASuW and ASW and is jointly connected to both the Navy and USMC. Additional details at a higher classification.						
FY 2023 Plans: N/A						
FY 2024 Base Plans:						

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Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem		Project (Number/Name) 0385 / Rapid Prototype Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Additional details at a higher classification.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of Osprey as a RDER initiative.						
Title: CoSyCo		0.000	0.000	10.000	0.000	10.000
Articles:		-	-	-	-	-
Description: Control Systems for Coordinated Operations (CoSyCo) will validate and rapidly deliver field-able datalinks and Command and Control networks, along with CONOPS and Tactics, Techniques, and Procedures (TTPs), for manned-unmanned teaming (MUM-T) between aircraft. This project will attempt to prove out the concept for in live-fly operations, accelerate the community understanding of acceptable cognitive loads for fighter pilots, and discover unrecognized synergy between these platforms. The CoSYCo effort is lead by the USAF out of Air Combat Command and the Navy will be playing a supporting role to their overall effort, aligning USN aerial target and autonomy development and demonstration efforts to reduce risk and field "playbooks" early (a playbook is a set of behaviors air vehicles will fly). The intent is to leverage ongoing USN projects and develop technology to provide the opportunity to fly USAF developed CoSyCo playbooks in a live environment on Navy targets. This risk reducing activity will create an organic ability to fly design reference missions (DRM) that are pertinent to adversary air, combat collaborative aircraft (CCA), and weapon system behavior development. Additionally, due to the lower Technology Readiness Level (TRL) or the end state USAF aerial platform, Navy targets is positioned to provide a "fly early" opportunity for the CoSyCo effort. The Navy will be focused on the rapid fielding capability of the autonomous behaviors required by the playbooks. Project 6019 funds Phase 1.						
PRJ 6019-CoSyCo, is a new start for FY 2024.						
FY 2023 Plans: N/A						
FY 2024 Base Plans: In preparation for Playbook flight test, begin digital engineering for software, networks, and autonomy. Start BQM-177 hardware design and procurement. Design and integrate Hyman Machine Interface (HMI)/Ground Control System (GCS) which will leverage Strategic Capabilities office (SCO) Avatar program to allow for target						

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Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem		Project (Number/Name) 0385 / Rapid Prototype Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
control on a tablet and explore the technology transfer of that functionality to a more traditional ground station. Begin software and hardware system integration and installation. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of CoSyCo as a RDER initiative.						
Title: LTAMDS-V <div>Articles:</div> Description: Lower Tier Anti-Missile Defense System - Variance (LTAMDS-V) is an experiment building on the Army's LTAMDS program of record. This experiment will incorporate a multi-mission expeditionary sensor capable of conducting cruise missile defense, counter air breathing threat (ABT) missions, and cUAS missions while supporting a broader kill chain. This project will test hardware and software implementation for possible inclusion into the SPY RADAR families. PRJ 6020-LTAMDS-V, is a new start for FY 2024 FY 2023 Plans: N/A FY 2024 Base Plans: Phase 1 will involve three tasks: Task 1: Draft experimental details, including scenarios, test systems, location, and time frame Task 2: Develop and test TBD C2 Interface Task 3: Refinement and further development of CUAS capability FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: FY 2024 funding increase reflects selection of LTAMDS-V as a RDER initiative.		0.000 -	0.000 -	20.000 -	0.000 -	20.000 -
Accomplishments/Planned Programs Subtotals		0.000	0.000	214.100	0.000	214.100

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Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604030N / <i>Rapid Prototyping, Experimentation & Dem</i>	Project (Number/Name) 0385 / <i>Rapid Prototype Development</i>
C. Other Program Funding Summary (\$ in Millions) N/A Remarks D. Acquisition Strategy <p>MATADOR-PRJ 2802- Improved software will be transitioned to current Relocatable Other The Horizon Radar (ROTHR) Program Office to operate the improved MASOR system.</p> <p>JAW Breaker- PRJ 6002- Aligns to the Tactical Edge Targeting (TET) program which is a Middle Tier Acquisition (MTA) Rapid Prototyping program within the Program Executive Office (PEO) Command, Control, Communications, Computers, Intelligence (C4I) and Space Systems. JAW BREAKER will support the development and integration of a new capability, and the refinement of Concepts of Operations, to enhance the ability of our warfighters to track and target adversaries in tactically challenging environments.</p> <p>Maritime Decoy and Deception-PRJ 6005- Hardware and software design, integration, and testing to demonstrate a new capability in support of fleet requirements and to further inform Joint operations. Various performers will be funded on their technology and level of effort to support integration and test events.</p> <p>PEGASUS- PRJ 6006- Design and develop Software and Hardware suitable for rotorcraft SWaP and frequency specific requirements, prototype, integrate, test and assess performance of capability to inform leadership as to the applicability for transition to a Program of Record.</p> <p>MADS-PRJ 6007- Short-term: Potential transition of experiment system to Fleet for risk-reduction activities and experimentation (current plan is to use a GFE GARC funded under separate program lines). Marinized Stinger launcher will be immediately available as an operational prototype for use by services on other vessels. Long-term: Full certification of the weapons and C3 system and new Program of Record to field the capability.</p> <p>METEOR-PRJ 6008- will transition to N96 upon completion. Hardware leave-behind for future operational experiments and incremental development. Transition to N96 for sustainment and inform future HPM increments, Terminal Defense NIF and emerging programs.</p> <p>RLAC-PRJ 6009- prototypes will transition to N957 and PMS 408.</p> <p>APEX-AIW-PRJ 6010- Hardware and software design, integration, and testing to demonstrate a new capability in support of the Joint force.</p> <p>STtNG- PRJ 6013- STtNG technology will be transitioned to OPNAV N2N6 and the CBSP program. Funding will be placed on SBIR II contract and will leverage NUWC Engineers.</p> <p>JTEN- PRJ 6014- Digital Engineering for modeling and Simulation will be a co-development between NIWC-PAC and NRL</p>		

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<p>Software development, integration and Test will be contracted on existing NRL contract with MITRE. Joint Architecture development will be a co-development between NRL and NIWC-PAC working with JTEN Architecture Working Group (government labor)</p> <p>Live-Virtual-Constructive (LVC) testing will be executed by the NIWC-PAC and NRL Navy team working with the other service labs (government labor). Analysis will be led by NIW-Pacific with NRL supported by MITRE Corp (using NRL's existing contract with MITRE). LVC, lab and field experiments will be led by NIWC-PAC/NRL supported by a contract (TBD) on existing NIWC-PAC contract.</p> <p>Cyber SHIELD- PRJ 6015- Validated design prototype at NAVFAC Power & Water Facilities at PACOM site. Architectures and training plans to support Service facilities commands & Industry. TTP and automation to NAVFAC plus other Services & Utilities.</p> <p>Key Partners / Participants: CCMD Sponsor(s): USINDOPACOM / USNORTHCOM Service Sponsor(s): USN / USMC / USARMY / USAF Government Technical Manager: NIWC LANT Mr. Salvatore (Rich) Scalco Overall Design Lead: JHU/APL Mr. Harley Parkes DOE Technical Lead: PNNL Mr. Mark Hadley Cyber Test Team: USAF 47th & USAF 346th</p> <p>Other Partners: UARC National Labs: JHU-APL, Sandia , PNNL, INL Industry partners: Cisco, SEL Inc., Palo Alto Networks, Dragos, Siemens (*Commercial vendors are pre-decisional pending OT site evaluations).</p> <p>MIM-PRJ 6016- The technology developed in this program will transition to PMS-495 and be resourced by OPNAV N952.</p> <p>DoM- PRJ 6017- Technology developed from this project will be used to inform Joint Force Maritime Component Command operational planners in the INDOPACOM theatre. Individual components will transition to USMC Tactical Services Oriented Architecture program of record and Navy's Distributed Operations program of record.</p> <p>CoSyCo-PRJ 6019- Digital engineering for software, networks, and autonomy development will be contracted on an existing contract with the Johns Hopkins University Applied Physics Laboratory. BQM-177 autonomy payload design, hardware procurement, and integration will be contracted on an existing PMA-208 contract with Kratos. Human Machine Interface (HMI)/SNTC Ground Control Station (GCS) modification will be contracted on an existing PMA-208 contract with MSI. Flight testing will be conducted at a the Pt Mugu Sea Range. Fund flight test costs at range(s). Fund BQM-177 launch and recovery at the Pacific Targets Management Office (PTMO).</p> <p>LTAMDS-V-PRJ 6020- Technology developed in this experiment is directly aligned with the Army's LTAMDS program and will transition to that program of record.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem				Project (Number/Name) 0385 / Rapid Prototype Development					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CoSyCo-Software Development and testing	SS/CPFF	JHU APL : Laurel, MD	0.000	0.000		0.000		2.000	Dec 2023	-		2.000	0.000	2.000	-
CoSyCo-BQM Hardware Development and Procurement	SS/CPFF	Kratos Defense and Security Solution : Sacramento, CA	0.000	0.000		0.000		2.750	Dec 2023	-		2.750	0.000	2.750	-
MATADOR- Govt Software Eng Support	WR	NRL : Washington D.C.	0.000	0.000		0.000		0.500	Oct 2023	-		0.500	0.000	0.500	-
MATADOR- Software Development	Various	WR Systems : Fairfax, VA	0.000	0.000		0.000		3.500	Oct 2023	-		3.500	0.000	3.500	-
RLAC- Develop and demonstrate standoff neutralization with Silent Saber, Compact Laser for Explosive Ordnance Disposal Neutralization	C/CPFF	Applied Research Associates : Albuquerque, New Mexico	0.000	0.000		0.000		1.100	Nov 2023	-		1.100	0.000	1.100	-
RLAC- Deliver small Unmanned Airborne Systems (sUAS) with automated target recognition and sensors for Explosive Ordnance Disposal detection, location and identification of unexploded ordnance	WR	NRL : Washington, D.C.	0.000	0.000		0.000		2.100	Nov 2023	-		2.100	0.000	2.100	-
RLAC- Deliver explosive tools, diagnostic capabilities and detection capabilities for subsurface targets	WR	NSWC IHD : Indian Head, Maryland	0.000	0.000		0.000		2.500	Nov 2023	-		2.500	0.000	2.500	-
RLAC- Provide damage repair detection and sensing capabilities for test and demonstration	WR	NSWC PCD : Panama City, Florida	0.000	0.000		0.000		2.500	Nov 2023	-		2.500	0.000	2.500	-
DoM- Task 1	Various	Various : Various	0.000	0.000		0.000		2.000	Oct 2023	-		2.000	0.000	2.000	-

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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
DoM- Task 2	Various	Various : Various	0.000	0.000		0.000		0.750	Dec 2023	-		0.750	0.000	0.750	-
DoM- Task 3	Various	Various : Various	0.000	0.000		0.000		0.650	Jan 2024	-		0.650	0.000	0.650	-
DoM- Task 4	Various	Various : Various	0.000	0.000		0.000		0.100	Oct 2023	-		0.100	0.000	0.100	-
MIM- Development & Demo	WR	NSWC PCD : Panama City, Florida	0.000	0.000		0.000		3.350	Oct 2023	-		3.350	0.000	3.350	-
MIM- Development & Demo	WR	NSWC CD : Bethesda, MD	0.000	0.000		0.000		1.675	Oct 2023	-		1.675	0.000	1.675	-
MIM- Development & Demo	C/CPFF	JHU APL : Laurel, MD	0.000	0.000		0.000		1.675	Nov 2023	-		1.675	0.000	1.675	-
JAW BREAKER	Various	Classified : Classified	0.000	0.000		0.000		9.800	Nov 2023	-		9.800	0.000	9.800	-
MTC A/X	Various	Classified : Classified	0.000	0.000		0.000		5.000	Oct 2023	-		5.000	0.000	5.000	-
STtNG- Inc. 3 Prototyping	C/CPFF	BASCOM : Baton Rouge, LA	0.000	0.000		0.000		7.000	Jan 2024	-		7.000	0.000	7.000	-
APEX-AIW- Govt Eng Support	WR	NSWC Carderock : Washington D.C.	0.000	0.000		0.000		0.300	Jan 2024	-		0.300	0.000	0.300	-
APEX-AIW- Hardware for Advanced Manufacturing	TBD	TBD : TBD	0.000	0.000		0.000		2.750	Jan 2024	-		2.750	0.000	2.750	-
APEX-AIW-USV and connector development	WR	various : various	0.000	0.000		0.000		1.550	Jan 2024	-		1.550	0.000	1.550	-
LOCUST-All Up Round Hardware	C/CPFF	Raytheon : Tuscon, AZ	0.000	0.000		0.000		10.000	Apr 2024	-		10.000	0.000	10.000	-
GRANDSTAND	Various	Classified : Classified	0.000	0.000		0.000		10.600	Nov 2023	-		10.600	0.000	10.600	-
MARKHOR	Various	Classified : Classified	0.000	0.000		0.000		17.000	Nov 2023	-		17.000	0.000	17.000	-
KRAKEN	Various	Classified : Classified	0.000	0.000		0.000		10.000	Nov 2023	-		10.000	0.000	10.000	-
DAWG	Various	Classified : Classified	0.000	0.000		0.000		1.800	Nov 2023	-		1.800	0.000	1.800	-
SEDNA	Various	Classified : Classified	0.000	0.000		0.000		10.000	Nov 2023	-		10.000	0.000	10.000	-
JTEN- Software development, Integration and testing	C/CPFF	MITRE : Boston, MA	0.000	0.000		0.000		2.100	Dec 2023	-		2.100	0.000	2.100	-

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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
JTEN- Joint Architecture development and interface definition	WR	NIWC PAC and NRL : San Diego, CA and Washington, D.C	0.000	0.000		0.000		0.900	Oct 2023	-		0.900	0.000	0.900	-
JTEN- Scenario development/Test plan	WR	NIWC PAC and NRL : San Diego, CA and Washington, D.C	0.000	0.000		0.000		0.720	Dec 2023	-		0.720	0.000	0.720	-
JTEN- Model development	WR	NIWC PAC : San Diego, CA	0.000	0.000		0.000		0.800	Dec 2023	-		0.800	0.000	0.800	-
Osprey	Various	Classified : Classified	0.000	0.000		0.000		20.000	Nov 2023	-		20.000	0.000	20.000	-
SPEARHEAD	WR	GTRI : Atlanta, GA	0.000	0.000		0.000		9.000	Dec 2023	-		9.000	0.000	9.000	-
LTAMDS-V- Development of C2 interface and CUAS capability	Various	Various : Various	0.000	0.000		0.000		20.000	Dec 2023	-		20.000	0.000	20.000	-
Cyber SHIELD- Development of cyber defense capabilities	Various	Various : Various	0.000	0.000		0.000		6.900	Oct 2023	-		6.900	0.000	6.900	-
Maritime Decoy and Deception	Various	Various : Various	0.000	0.000		0.000		5.600	Dec 2023	-		5.600	0.000	5.600	-
PEGASUS	Various	Various : Various	0.000	0.000		0.000		3.410	Oct 2023	-		3.410	0.000	3.410	-
MADS	Various	Various : Various	0.000	0.000		0.000		5.000	Nov 2023	-		5.000	0.000	5.000	-
METEOR	Various	Various : Various	0.000	0.000		0.000		1.590	Nov 2023	-		1.590	0.000	1.590	-
CoSyCo-HMI/GCS Modification	SS/CPFF	MSI : Fort Walton Beach, FL	0.000	0.000		0.000		2.750	Dec 2023	-		2.750	0.000	2.750	-
Subtotal			0.000	0.000		0.000		191.720		-		191.720	0.000	191.720	N/A
Remarks															
MIM- This project will develop and deliver three prototype MIMs, modify and deliver a prototype surface ship MIM launcher, and conduct an in-water demonstration on a Navy test range in Panama City, FL.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604030N / <i>Rapid Prototyping, Experimentation & Dem</i>						Project (Number/Name) 0385 / <i>Rapid Prototype Development</i>			
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CoSyCo-Program Management	WR	NAWCAD : Pax River, MD	0.000	0.000		0.000		0.300	Dec 2023	-		0.300	0.000	0.300	-
CoSyCo- Range Support	WR	Pt.Mugu Sea Range : NAS Ventura County, CA	0.000	0.000		0.000		0.800	Jan 2024	-		0.800	0.000	0.800	-
CoSyCo-Target Launch Support	WR	Pacific Targets Management Office : NAS Ventura County, CA	0.000	0.000		0.000		1.300	Feb 2024	-		1.300	0.000	1.300	-
RLAC- Labor, shipment and test execution for damage repair test events	WR	NSWC Panama City : Panama City, Florida	0.000	0.000		0.000		1.500	Nov 2023	-		1.500	0.000	1.500	-
APEX-AIW- Small test event demonstrations	WR	various : various	0.000	0.000		0.000		2.500	Jan 2024	-		2.500	0.000	2.500	-
APEX-AIW-Preperation for large test event (Talisman Saber)	WR	various : various	0.000	0.000		0.000		3.000	Jan 2024	-		3.000	0.000	3.000	-
JTEN- Software test	C/CPFF	TBD : TBD	0.000	0.000		0.000		2.500	Dec 2023	-		2.500	0.000	2.500	-
JTEN- Architecture validation	WR	NIWC PAC and NRL : San Diego, CA and Washington, D.C	0.000	0.000		0.000		0.620	Oct 2023	-		0.620	0.000	0.620	-
JTEN- System Engineering Review	WR	NIWC PAC and NRL : San Diego, CA and Washington, D.C	0.000	0.000		0.000		0.270	Oct 2023	-		0.270	0.000	0.270	-
JTEN- Test Planning/ validation	WR	NIWC PAC and NRL : San Diego, CA and Washington, D.C	0.000	0.000		0.000		0.450	Oct 2023	-		0.450	0.000	0.450	-
JTEN- M&S Support	C/CPFF	TBD : TBD	0.000	0.000		0.000		2.500	Dec 2023	-		2.500	0.000	2.500	-
JTEN- LVC Lab Capability Analysis	WR	NIWC PAC and NRL : San Diego, CA and Washington, D.C	0.000	0.000		0.000		0.780	Oct 2023	-		0.780	0.000	0.780	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem				Project (Number/Name) 0385 / Rapid Prototype Development					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
JTEN- LVC Lab Prep/Test Execution	WR	NIWC PAC and NRL : San Diego, CA and Washington, D.C	0.000	0.000		0.000		0.780	Oct 2023	-		0.780	0.000	0.780	-
JTEN- Field Experiment	WR	NIWC PAC and NRL : San Diego, CA and Washington, D.C	0.000	0.000		0.000		1.800	Oct 2023	-		1.800	0.000	1.800	-
JTEN- Range Cost	WR	NIWC PAC and NRL : San Diego, CA and Washington, D.C	0.000	0.000		0.000		0.500	Oct 2023	-		0.500	0.000	0.500	-
Subtotal			0.000	0.000		0.000		19.600		-		19.600	0.000	19.600	N/A
Remarks															
Identification of technology candidates and prototypes approved by the Office of the Under Secretary of Defense for Research and Engineering (OUSD(R&E)) Rapid Defense Experimentation Reserve (RDER) initiative															
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Test & Evaluation (OT&E)	WR	NRL : Washington, D.C.	0.000	0.000		0.000		0.500	Oct 2023	-		0.500	0.000	0.500	-
Subtotal			0.000	0.000		0.000		0.500		-		0.500	0.000	0.500	N/A
Remarks															
OT&E related to PRJ 2802, MATADOR															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CoSyCo-Engineering Services Support	TBD	TBD : TBD	0.000	0.000		0.000		0.100	Mar 2024	-		0.100	0.000	0.100	-

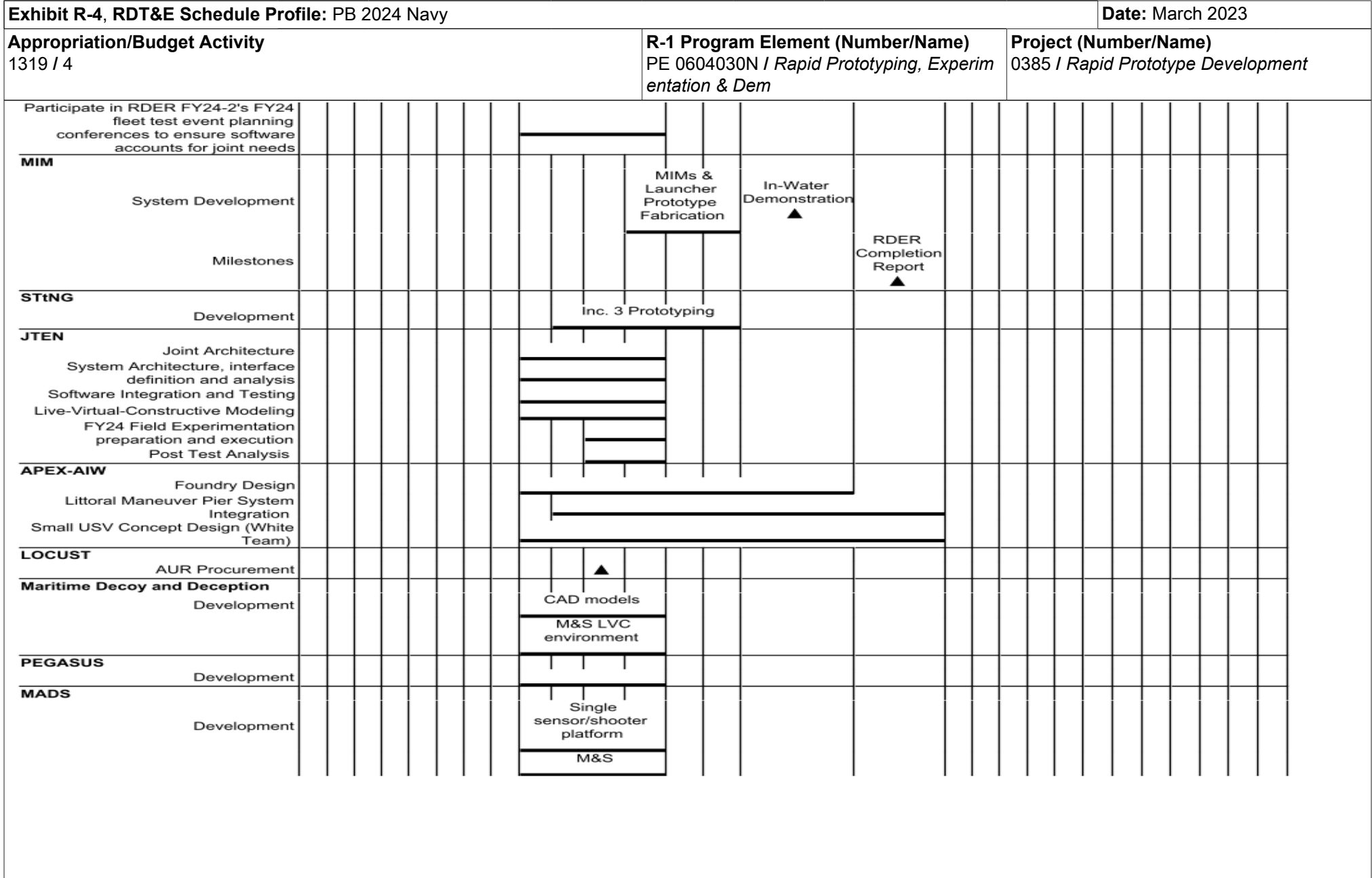
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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem						Project (Number/Name) 0385 / Rapid Prototype Development			
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
RLAC-Management Services includes support for cost, schedule and performance tracking	SS/CPFF	Proteq : Herndon, Virginia	0.000	0.000		0.000		0.500	Nov 2023	-		0.500	0.000	0.500	-
STtNG- Engineering Services Support	WR	NUWC Newport : Newport, RI	0.000	0.000		0.000		1.300	Jan 2024	-		1.300	0.000	1.300	-
JTEN- Program Management	WR	NIWC PAC and NRL : San Diego, CA and Washington, D.C	0.000	0.000		0.000		0.380	Dec 2023	-		0.380	0.000	0.380	-
Subtotal			0.000	0.000		0.000		2.280		-		2.280	0.000	2.280	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		0.000		214.100		-		214.100	0.000	214.100	N/A
Remarks															
JTEN- This project will coordinate with USAF CTEN project and US Army's Tactical Software Defined Network projects (e.g. ModRF). CoSyCo- Thie project will collaborate with the USAF CoSyCo team to host playbooks on Navy targets that are modified to provide this capability.															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																		Date: March 2023																								
Appropriation/Budget Activity 1319 / 4														R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem						Project (Number/Name) 0385 / Rapid Prototype Development																						
FY 2024 RDER Initiatives														FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				
														1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	
CoSyCo																																										
Digital engineering for software, networks, and autonomy																																										
BQM-177 hardware design and procurement																																										
Human Machine Interface Development																																										
Software and hardware system integration																																										
System Execution: Playbook flight event																																										
MATADOR																																										
Initial software developments for improvement to OTRH systems																																										
Initial data collection and experimentation																																										
Review findings of the experimentation and finalize software package																																										
RLAC																																										
Individual subsystem testing in operationally relevant test environments																																										
Unmanned System Flights for verification of Automated Target Recognition integrated with Silent Saber target handover, integrated detection and sensor																																										
Shipments of systems to combatant command areas for test and evaluation, operator training and evaluation of the Rapid Large Area Clearance capability																																										
Analysis, Synthesis and Report writing as well as CONUS demonstration for stakeholders.																																										
DoM																																										
Integrate and deploy planning software to RDER FY24-2's FY24 fleet testing event (e.g., Valient Shield 24).																																										
Develop user and training guides to FY24 test event.																																										
Revise planning software based on fleet feedback from October 2023 test event at Oahu.																																										

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PE 0604030N: *Rapid Prototyping, Experimentation & Dem*
Navy

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PE 0604030N / Rapid Prototyping, Experimentation & Dem

0385 / Rapid Prototype Development



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604030N / <i>Rapid Prototyping, Experimentation & Dem</i>	Project (Number/Name) 0385 / <i>Rapid Prototype Development</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>FY 2024 RDER Initiatives</i>				
CoSyCo: Digital engineering for software, networks, and autonomy:	1	2024	4	2024
CoSyCo: BQM-177 hardware design and procurement:	1	2024	4	2024
CoSyCo: Human Machine Interface Development:	1	2024	4	2024
CoSyCo: Software and hardware system integration:	3	2024	1	2025
CoSyCo: System Execution: Playbook flight event:	3	2024	1	2025
MATADOR: Initial software developments for improvement to OTRH systems: Task 1	1	2024	2	2024
MATADOR: Initial data collection and experimentation: Task 2	3	2024	3	2024
MATADOR: Review findings of the experimentation and finalize software package: Task 3	3	2024	4	2024
RLAC: Individual subsystem testing in operationally relevant test environments: Q1	1	2024	1	2024
RLAC: Unmanned System Flights for verification of Automated Target Recognition integrated with Silent Saber target handover, integrated detection and sensor: Q2	2	2024	2	2024
RLAC: Shipments of systems to combatant command areas for test and evaluation, operator training and evaluation of the Rapid Large Area Clearance capability: Q3	3	2024	3	2024
RLAC: Analysis, Synthesis and Report writing as well as CONUS demonstration for stakeholders.: Q4	4	2024	4	2024
DoM: Integrate and deploy planning software to RDER FY24-2's FY24 fleet testing event (e.g., Valient Shield 24): Task 1	1	2024	4	2024
DoM: Develop user and training guides to FY24 test event.: Task 2	2	2024	4	2024
DoM: Revise planning software based on fleet feedback from October 2023 test event at Oahu.: Task 3	2	2024	4	2024
DoM: Participate in RDER FY24-2's FY24 fleet test event planning conferences to ensure software accounts for joint needs: Task 4	1	2024	4	2024

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0604030N / *Rapid Prototyping, Experimentation & Dem*

Project (Number/Name)

0385 / *Rapid Prototype Development*

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
MIM: System Development: System Development	1	2024	4	2024
MIM: System Development: Launcher Design Modification	2	2024	4	2024
MIM: System Development: MIMs & Launcher Prototype Fabrication	4	2024	2	2025
MIM: System Development: In-Water Demonstration	3	2025	3	2025
MIM: Milestones: RDER Completion Report	4	2025	4	2025
STtNG: Development: Inc. 3 Prototyping	2	2024	2	2025
JTEN: Joint Architecture:	1	2024	4	2024
JTEN: System Architecture, interface definition and analysis:	1	2024	4	2024
JTEN: Software Integration and Testing:	1	2024	4	2024
JTEN: Live-Virtual-Constructive Modeling:	1	2024	4	2024
JTEN: FY24 Field Experimentation preparation and execution:	3	2024	4	2024
JTEN: Post Test Analysis:	3	2024	4	2024
APEX-AIW: Foundry Design: Task 1	1	2024	3	2025
APEX-AIW: Littoral Maneuver Pier System Integration: Task 2	2	2024	4	2025
APEX-AIW: Small USV Concept Design (White Team): Task 3	1	2024	4	2025
LOCUST: AUR Procurement:	3	2024	3	2024
Maritime Decoy and Deception: Development: CAD models	1	2024	4	2024
Maritime Decoy and Deception: Development: M&S LVC environment	1	2024	4	2024
PEGASUS: Development:	1	2024	4	2024
MADS: Development: Single sensor/shooter platform	1	2024	4	2024
MADS: Development: M&S	1	2024	4	2024
METEOR: Development:	1	2024	4	2024
SPEARHEAD: Development: System software and proof-of-concept	1	2024	4	2024
LTAMDS-V: Draft experimental details, including scenarios, test systems, location, and time frame: Task 1	1	2024	4	2024
LTAMDS-V: Develop and test TBD C2 Interface: Task 2	1	2024	4	2024

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem		Project (Number/Name) 0385 / Rapid Prototype Development	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
LTAMDS-V: Refinement and further development of CUAS capability: Task 3		1	2024	4	2024
Cyber SHIELD: Phase 1: Task 1: Spiral 0 - Integrate OT SDN into Testbed		1	2024	1	2024
Cyber SHIELD: Phase 1: Task 2: Spiral 1 - Integrate OT SDN into Architecture		2	2024	2	2024
Cyber SHIELD: Phase 1: Task 3: Spiral 2 - Guam Site Survey for two sectors (e.g., water and power utility), including decomposition		1	2024	4	2024
Cyber SHIELD: Phase 1: Task 4: Spiral 3 - Transition Integrity Checks/Orchestration		3	2024	1	2025
Cyber SHIELD: Deliverables: Technical Report (Build/Deployment Approach)		1	2025	1	2025
Cyber SHIELD: Deliverables: Extended Mitigation Playbook(s)		1	2025	1	2025
Cyber SHIELD: Go/No-Go Decision: Decision 1- Guam site survey validation		2	2025	2	2025
Cyber SHIELD: Go/No-Go Decision: Decision 2- Testbed Success		2	2025	2	2025
Cyber SHIELD: Go/No-Go Decision: Decision 3- OT SDN functionality capability cybersecurity demonstration		2	2025	2	2025
Cyber SHIELD: Phase 2: Task 1: Spiral 4 - Guam Deployment		1	2025	2	2025
Cyber SHIELD: Phase 2: Task 2: Final design specifications and As-built installation drawings		2	2025	3	2025
Cyber SHIELD: Phase 2 : Task 3: DOD CIO Cybersecurity Reference Architecture Appendix D for Control Systems update		2	2025	3	2025
Cyber SHIELD: Deliverables: Comprehensive Final Report		4	2025	4	2025
Cyber SHIELD: Deliverables: Design guide updates to the DOD Unified Capabilities Requirements (UCR) Unified Facilities		4	2025	4	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604030N / <i>Rapid Prototyping, Experimentation & Dem</i>				Project (Number/Name) 2803 / <i>Classified #5</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2803: <i>Classified #5</i>	0.000	0.000	3.500	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.500
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification Details held at a higher classification												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)												
							FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	
Title: Classified #5							0.000	3.500	0.000	0.000	0.000	
Articles:							-	-	-	-	-	
FY 2023 Plans: Details held at a higher classification												
FY 2024 Base Plans: N/A												
FY 2024 OCO Plans: N/A												
FY 2023 to FY 2024 Increase/Decrease Statement: Details held at a higher classification												
Accomplishments/Planned Programs Subtotals							0.000	3.500	0.000	0.000	0.000	
C. Other Program Funding Summary (\$ in Millions) N/A												
Remarks												
D. Acquisition Strategy N/A												

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem						Project (Number/Name) 2803 / Classified #5			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
classified	TBD	TBD : TBD	0.000	0.000		3.500	Nov 2022	0.000		-		0.000	0.000	3.500	-
Subtotal			0.000	0.000		3.500		0.000		-		0.000	0.000	3.500	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		3.500		0.000		-		0.000	0.000	3.500	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy										Date: March 2023																			
Appropriation/Budget Activity 1319 / 4										R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem										Project (Number/Name) 2803 / Classified #5									

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 2803																												
Classified																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604030N / <i>Rapid Prototyping, Experimentation & Dem</i>	Project (Number/Name) 2803 / <i>Classified #5</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 2803</i>				
Classified	1	2023	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem				Project (Number/Name) 2804 / OCTOPUS			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2804: OCTOPUS	0.000	0.000	17.580	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	17.580
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Note PRJ 2804- OCTOPUS, is a new start for FY2023.												
A. Mission Description and Budget Item Justification Octopus is an integration of multi-modal communication technologies enabling multi-domain remote command and control (C2), long-range fires, and enhanced communications to support Joint Warfighting operations in a contested environment. Octopus will enable remote C2 by leveraging a rapidly deployed, cabled infrastructure, to employ acoustic, optical, and Radio Frequency (RF) communications and allow remote operators to communicate with air, surface, and subsurface assets. Octopus provides resilient communications to the battlespace Commander in a denied environment. This effort directly supports several of the Combatant Commands Integrated Priority List (IPLs), and will provide insight into Concept of Operations (CONOPs) development in support of the Joint Warfighting Concept (JWC).												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Octopus Articles: FY 2023 Plans: This system will integrate and test various existing technologies by first modeling each integrated capability into a Live Virtual Constructed (LVC) operation and mission planning event. Each one of these technologies will be integrated into a common C2 suite, that will allow operators to utilize each type of communication method based on situational requirements and needs. As a milestone test event, Octopus will participate in a Fleet Experiment (Northern Edge 2023) from a remote location to exercise its remote C2 and communications capabilities. FY 2024 Base Plans: N/A FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Decrease due to project completion.								0.000	17.580	0.000	0.000	0.000
								-	-	-	-	-
Accomplishments/Planned Programs Subtotals								0.000	17.580	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604030N / <i>Rapid Prototyping, Experimentation & Dem</i>	Project (Number/Name) 2804 / <i>OCTOPUS</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy Hardware and software design, integration and testing to demonstrate a new capability in support of fleet requirements and to further inform Joint operations. Various performers will be funded based on their technology and level of effort to support integration and test events.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0604030N / Rapid Prototyping, Experimentation & Dem

Project (Number/Name)

2804 / OCTOPUS

Product Development (\$ in Millions)

				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
C2 Integration, software development and communications enabler development	MIPR	NUWC NP : Newport RI	0.000	0.000		1.100	Mar 2023	0.000		-		0.000	0.000	1.100	-
Communications equipment procurement and cyber security development	MIPR	NUWC NP : Newport RI	0.000	0.000		0.300	Mar 2023	0.000		-		0.000	0.000	0.300	-
System Engineering/ Integration; Technical Management; Subsystem Development; Independent Assesor	MIPR	NIWC PAC : San Diego, CA	0.000	0.000		6.880	Mar 2023	0.000		-		0.000	0.000	6.880	-
Product Procurements for Communications Nodes and mission engineering	MIPR	NIWC PAC : San Diego, CA	0.000	0.000		2.200	Mar 2023	0.000		-		0.000	0.000	2.200	-
Subtotal			0.000	0.000		10.480		0.000		-		0.000	0.000	10.480	N/A

Test and Evaluation (\$ in Millions)

				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	MIPR	NAVFAC EXWC : Port Hueneme, CA	0.000	0.000		4.800	Mar 2023	0.000		-		0.000	0.000	4.800	-
Developmental Test & Evaluation (DT&E)	MIPR	NIWC PAC : San Diego, CA	0.000	0.000		1.400	Mar 2023	0.000		-		0.000	0.000	1.400	-
Developmental Test & Evaluation (DT&E)	MIPR	NUWC NP : Newport RI	0.000	0.000		0.200	Mar 2023	0.000		-		0.000	0.000	0.200	-
Subtotal			0.000	0.000		6.400		0.000		-		0.000	0.000	6.400	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem						Project (Number/Name) 2804 / OCTOPUS			
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Management and Oversight	MIPR	USINDOPACOM : Aiea, HI	0.000	0.000		0.700	Apr 2023	0.000		-		0.000	0.000	0.700	-
Subtotal			0.000	0.000		0.700		0.000		-		0.000	0.000	0.700	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		17.580		0.000		-		0.000	0.000	17.580	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy												Date: March 2023					
Appropriation/Budget Activity 1319 / 4								R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem						Project (Number/Name) 2804 / OCTOPUS			

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 2804																												
Finalize system architecture and requirements																												
Preliminary design development/review and long lead procurements initiated																												
Modeling and Simulation created and executed via the LVC event																												
Lab Based integrated system demonstration and verification																												
Participation in Tech Demonstration; Risk Reduction Testing																												
Critical Design Review																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604030N / <i>Rapid Prototyping, Experimentation & Dem</i>	Project (Number/Name) 2804 / <i>OCTOPUS</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2804				
Finalize system architecture and requirements	2	2023	3	2023
Preliminary design development/review and long lead procurements initiated	3	2023	4	2023
Modeling and Simulation created and executed via the LVC event	4	2023	1	2024
Lab Based integrated system demonstration and verification	4	2023	1	2024
Participation in Tech Demonstration; Risk Reduction Testing	4	2023	1	2024
Critical Design Review	1	2024	1	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem				Project (Number/Name) 2805 / GRASP-X			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2805: GRASP-X	0.000	0.000	3.750	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.750
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Note PRJ 2805- GRASP-X, is a new start for FY2023. GRASP-X is a follow-on to the FY-20 GRASP Warfighter Lab Incentive Fund (WLIF) project which automated geolocation and reporting against a single threat threat system of interest to USINDOPACOM and the EA-18G Growler. In addition to addressing additional, new signals of interest, GRASP-X also integrates and demonstrates an interface to more rapidly obtain additional overhead collection. GRASP WLIF project was previously funded in Program Element 0603829J.												
A. Mission Description and Budget Item Justification Geo-location and Reporting of Advanced Signals Pacific - eXpanded (GRASP-X) project 2805 is a follow-on project to expand the GRASP capability to additional threat signals of interest to USINDOPACOM. NAVAIR PMA-265 Program Office, EA-18G will transition capability into base Command & Control (C2) and Electromagnetic Support (ES) programs. Initial Operational Capability (IOC) by Q2 FY24.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: GRASP-X Articles: FY 2023 Plans: -GRASPX interface to AIM enabled -Field demo, software mods to add 2 new threats, AARGM-ER Precision Strike Options -GRASPx Limited Operations FY 2024 Base Plans: N/A FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: decrease due to project completion.								0.000	3.750	0.000	0.000	0.000
								-	-	-	-	-
Accomplishments/Planned Programs Subtotals								0.000	3.750	0.000	0.000	0.000

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604030N / <i>Rapid Prototyping, Experimentation & Dem</i>	Project (Number/Name) 2805 / <i>GRASP-X</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy Leverage existing USINDOPACOM FFRDC (GTRI), AFRL, and NRO contracts to develop, integrate, test, and deliver new capability.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem						Project (Number/Name) 2805 / GRASP-X			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	SS/CPFF	NGC : Falls Church, VA	0.000	0.000		0.800	Mar 2023	0.000		-		0.000	0.000	0.800	0.800
Software Development	SS/CPFF	ZETA : Fairfax, VA	0.000	0.000		0.600	Mar 2023	0.000		-		0.000	0.000	0.600	0.600
Primary Hardware Development	SS/CPFF	MSRL : Lorton, VA	0.000	0.000		0.950	Mar 2023	0.000		-		0.000	0.000	0.950	0.950
Subtotal			0.000	0.000		2.350		0.000		-		0.000	0.000	2.350	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Eng & Tech Services	TBD	NSWC : Crane, IN	0.000	0.000		0.800	Mar 2023	0.000		-		0.000	0.000	0.800	0.800
Development Support	SS/CPFF	GTRI : Atlanta, GA	0.000	0.000		0.600	Mar 2023	0.000		-		0.000	0.000	0.600	0.600
Subtotal			0.000	0.000		1.400		0.000		-		0.000	0.000	1.400	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		3.750		0.000		-		0.000	0.000	3.750	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

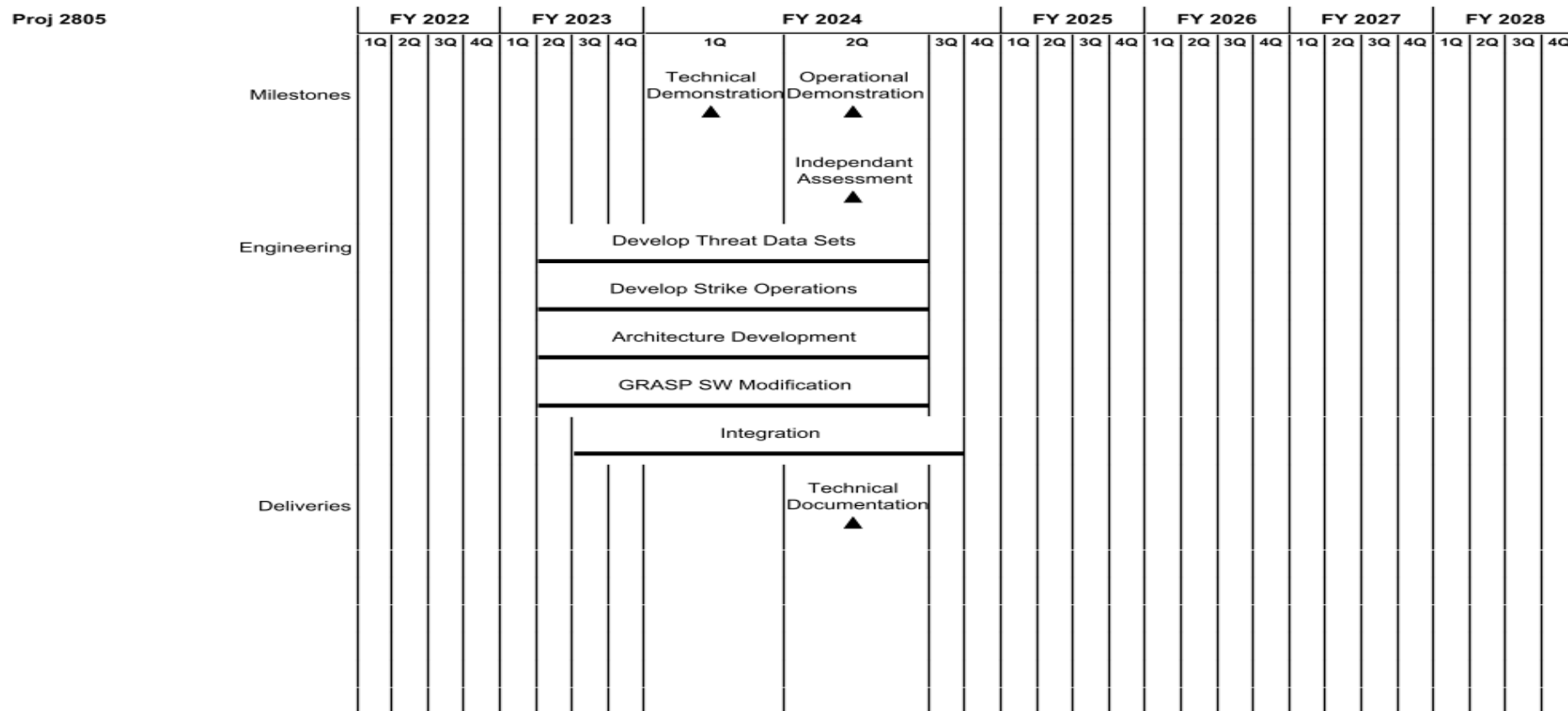
1319 / 4

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PE 0604030N / Rapid Prototyping, Experimentation & Dem

Project (Number/Name)	Start Date	End Date	Status	Manager	Budget (USD)	Actual Cost (USD)	Progress (%)	Risk Level	Notes
101/Alpha	2023-01-15	2023-03-31	Completed	J. Doe	120,000	118,500	100	Low	Exceeded budget by 1.25%
102/Beta	2023-02-01	2023-05-15	In Progress	A. Smith	250,000	180,000	72	Medium	Minor delays in procurement
103/Gamma	2023-03-10	2023-06-30	On Hold	M. Chen	80,000	0	0	High	Waiting for client approval
104/Delta	2023-04-01	2023-07-31	Planned	S. Kim	150,000	0	0	Medium	Initial planning phase
105/Epsilon	2023-05-01	2023-08-31	Not Started	L. Garcia	90,000	0	0	Low	Resource allocation pending
106/Zeta	2023-06-01	2023-09-30	On Hold	K. Lee	110,000	0	0	Medium	Scope creep concerns
107/Eta	2023-07-01	2023-10-31	Planned	H. Patel	130,000	0	0	Low	Vendor selection in progress
108/Theta	2023-08-01	2023-11-30	Not Started	D. Brown	70,000	0	0	Medium	Initial requirements gathering
109/Iota	2023-09-01	2023-12-31	Planned	R. White	100,000	0	0	Low	Contract review phase
110/Kappa	2023-10-01	2024-01-31	Not Started	C. Black	140,000	0	0	Medium	Market research ongoing

2805 / GRASP-X



2024PB - 0604030N - 2805

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem	Project (Number/Name) 2805 / GRASP-X	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2805				
Milestones: Technical Demonstration	1	2024	1	2024
Milestones: Operational Demonstration	2	2024	2	2024
Milestones: Independant Assessment	2	2024	2	2024
Engineering: Develop Threat Data Sets	2	2023	2	2024
Engineering: Develop Strike Operations	2	2023	2	2024
Engineering: Architecture Development	2	2023	2	2024
Engineering: GRASP SW Modification	2	2023	2	2024
Engineering: Integration	3	2023	3	2024
Deliveries: Technical Documentation	2	2024	2	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604030N / <i>Rapid Prototyping, Experimentation & Dem</i>				Project (Number/Name) 2806 / <i>Classified #1</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2806: <i>Classified #1</i>	0.000	0.000	20.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	20.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification Details held at a higher classification												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)												
							FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	
Title: Classified #1							0.000	20.000	0.000	0.000	0.000	
Articles:							-	-	-	-	-	
FY 2023 Plans: Details held at a higher classification												
FY 2024 Base Plans: N/A												
FY 2024 OCO Plans: N/A												
FY 2023 to FY 2024 Increase/Decrease Statement: Details held at a higher classification												
Accomplishments/Planned Programs Subtotals							0.000	20.000	0.000	0.000	0.000	
C. Other Program Funding Summary (\$ in Millions) N/A												
Remarks												
D. Acquisition Strategy N/A												

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem						Project (Number/Name) 2806 / Classified #1			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
classified	TBD	TBD : TBD	0.000	0.000		20.000	Nov 2022	0.000		-		0.000	0.000	20.000	-
Subtotal			0.000	0.000		20.000		0.000		-		0.000	0.000	20.000	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		20.000		0.000		-		0.000	0.000	20.000	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy										Date: March 2023																			
Appropriation/Budget Activity 1319 / 4										R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem										Project (Number/Name) 2806 / Classified #1									

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 2806																												
classified																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem	Project (Number/Name) 2806 / Classified #1

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2806				
classified	1	2023	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604030N / <i>Rapid Prototyping, Experimentation & Dem</i>				Project (Number/Name) 2807 / <i>Classified #2</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2807: <i>Classified #2</i>	0.000	0.000	5.750	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.750
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification Details held at a higher classification												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)												
							FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	
Title: Hyperspectral Upgrade to Classified #2							0.000	5.750	0.000	0.000	0.000	
Articles:							-	-	-	-	-	
FY 2023 Plans: Details held at a higher classification												
FY 2024 Base Plans: N/A												
FY 2024 OCO Plans: N/A												
FY 2023 to FY 2024 Increase/Decrease Statement: Details held at a higher classification												
Accomplishments/Planned Programs Subtotals							0.000	5.750	0.000	0.000	0.000	
C. Other Program Funding Summary (\$ in Millions) N/A												
Remarks												
D. Acquisition Strategy N/A												

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem						Project (Number/Name) 2807 / Classified #2			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
classified	TBD	TBD : TBD	0.000	0.000		5.750	Nov 2022	0.000		-		0.000	0.000	5.750	-
Subtotal			0.000	0.000		5.750		0.000		-		0.000	0.000	5.750	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		5.750		0.000		-		0.000	0.000	5.750	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy										Date: March 2023																			
Appropriation/Budget Activity 1319 / 4										R-1 Program Element (Number/Name) PE 0604030N / Rapid Prototyping, Experimentation & Dem										Project (Number/Name) 2807 / Classified #2									

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 2807																												
classified																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604030N / <i>Rapid Prototyping, Experimentation & Dem</i>	Project (Number/Name) 2807 / <i>Classified #2</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 2807</i>				
classified	1	2023	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	PE 0604031N / <i>Large Unmanned Undersea Vehicles</i>											
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	208.714	27.510	0.000	6.900	-	6.900	7.037	5.284	2.753	2.736	Continuing	Continuing
2094: <i>Unmanned Underwater Vehicle</i>	208.714	27.510	0.000	6.900	-	6.900	7.037	5.284	2.753	2.736	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Snakehead Large Displacement Unmanned Undersea Vehicle (LDUUV) is the Navy's Large UUV effort as part of the Family of UUVs, in support of maintaining the Navy's undersea superiority. It is the Navy's largest Submarine-launched UUV, providing increased endurance, depth capability, and payload capacity beyond small and medium class submarine deployed UUVs. The Snakehead LDUUV is modular in design and includes high accuracy mission sensors and communications links, as well as modular payload capabilities. Modules have well defined interfaces for the purposes of implementing cost-effective upgrades in future increments to leverage advances in technology.

The Snakehead LDUUV program is a CNO/ASN(RDA) approved Accelerated Acquisition, featuring a phased approach to grow capabilities at a manageable level of risk. Phase 1 is a Government developed prototype with significant Industry involvement to develop Techniques, Tactics, and Procedures (TTPs), Concepts of Operation (CONOPS), and risk reductions for submarine and surface ship integration. One Phase 1 vehicle, with sufficient test spares, was fabricated and commenced subsystem testing in FY21 and vehicle in-water testing in FY22. Future LDUUV requirements include increased capabilities and integration onto Modernized DDS, as well as integration onto surface ships. Phase 2 efforts were stopped in FY22.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	65.672	0.000	0.000	-	0.000
Current President's Budget	27.510	0.000	6.900	-	6.900
Total Adjustments	-38.162	0.000	6.900	-	6.900
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-36.000	0.000			
• SBIR/STTR Transfer	-2.162	0.000			
• Program Adjustments	0.000	0.000	6.839	-	6.839
• Rate/Misc Adjustments	0.000	0.000	0.061	-	0.061

Change Summary Explanation

Technical: Not applicable.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	
1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	PE 0604031N / Large Unmanned Undersea Vehicles	
Schedule: Not applicable.		
Cost:		
FY 2022: -\$2.162M Small Business Innovative Research (SBIR), -\$36.0M Above Threshold Reprogramming (ATR)		
FY 2023: No Change		
FY 2024: +6.839M Program adjustment: Continue LDUUV Phase I Testing and Experimentation; +\$0.061M Miscellaneous Adjustment		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604031N / Large Unmanned Undersea Vehicles				Project (Number/Name) 2094 / Unmanned Underwater Vehicle			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2094: Unmanned Underwater Vehicle	208.714	27.510	0.000	6.900	-	6.900	7.037	5.284	2.753	2.736	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

FY22 Funding - \$36.0M Above Threshold Reprogramming (ATR) completed

A. Mission Description and Budget Item Justification

The Snakehead Large Displacement Unmanned Undersea Vehicle (LDUUV) is the Navy's Large UUV effort as part of the Family of UUVs, in support of maintaining the Navy's undersea superiority. It is the Navy's largest Submarine-launched UUV, providing increased endurance, depth capability, and payload capacity beyond small and medium class submarine deployed UUVs. The Snakehead LDUUV is modular in design and includes high accuracy mission sensors and communications links, as well as modular payload capabilities. Modules have well defined interfaces for the purposes of implementing cost-effective upgrades in future increments to leverage advances in technology. The Snakehead program is a CNO/ASN(RDA) approved Accelerated Acquisition, featuring a phased approach to build capabilities at a manageable level of risk in the Navy's class of Large Displacement Unmanned Undersea Vehicles.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: LDUUV Product Development	24.260	0.000	5.800	0.000	5.800
Articles:	-	-	-	-	-
FY 2023 Plans: N/A					
FY 2024 Base Plans: Re-start LDUUV Program with demonstrations and experimentation of the prototype system. Provide technical and systems engineering for execution of demos, testing, and system refurbishment, and upgrades as required.					
FY 2024 OCO Plans: N/A					
FY 2023 to FY 2024 Increase/Decrease Statement: Increase from FY23 to FY24 is for continuation of the LDUUV program with demonstrations and experimentation of the prototype system.					
Title: LDUUV Support	2.250	0.000	0.525	0.000	0.525
Articles:	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023				
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604031N / Large Unmanned Undersea Vehicles		Project (Number/Name) 2094 / Unmanned Underwater Vehicle				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)				FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
FY 2023 Plans: N/A								
FY 2024 Base Plans: Support re-start of LDUUV ILS efforts.								
FY 2024 OCO Plans: N/A								
FY 2023 to FY 2024 Increase/Decrease Statement: Increase due to FY2023 being zeroed out.								
Title: LDUUV Management Services				1.000	0.000	0.575	0.000	0.575
Articles:				-	-	-	-	-
FY 2023 Plans: N/A								
FY 2024 Base Plans: Provide program management support and travel for Phase 1 in-water test execution and fleet demonstrations.								
FY 2024 OCO Plans: N/A								
FY 2023 to FY 2024 Increase/Decrease Statement: Increase from FY23 to FY24 is for the continuation of management of the demonstrations, experimentation, engineering and integration of the prototype system.								
Accomplishments/Planned Programs Subtotals				27.510	0.000	6.900	0.000	6.900
C. Other Program Funding Summary (\$ in Millions)								
N/A								
Remarks								
D. Acquisition Strategy								
Snakehead LDUUV Phase 1 is a single Government developed prototype with significant Industry involvement to develop Techniques, Tactics, and Procedures (TTP) and Concepts of Operation (CONOPS) and reduce risk for submarine and surface ship integration. The Navy shared a Phase 1 Technical Data Package with Industry. Due to the lack of funds in FY23 and out, Phase 2 efforts were stopped in FY22.								

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604031N / Large Unmanned Undersea Vehicles				Project (Number/Name) 2094 / Unmanned Underwater Vehicle					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
LDUUV Industry Prototypes and Demos	Various	Various : Various	0.000	2.670	Apr 2022	0.000		0.000		-		0.000	0.000	2.670	-
LDUUV Vehicles, Hardware, Design, & Demos	WR	NUWC Newport : Newport, RI	57.760	7.000	Nov 2021	0.000		4.000	Nov 2023	-		4.000	Continuing	Continuing	Continuing
LDUUV Vehicles, Hardware, Design, & Demos	C/CPFF	Various : Various	46.369	0.200	Oct 2021	0.000		0.500	Jan 2024	-		0.500	Continuing	Continuing	Continuing
LDUUV Vehicles, Hardware, Design, & Demos	WR	NSWC Carderock : West Bethesda, MD	21.113	2.500	Nov 2021	0.000		0.800	Nov 2023	-		0.800	0.000	24.413	-
LDUUV Vehicles, Hardware,& Design	WR	NSWC Panama City : Panama City, FL	0.166	0.000		0.000		0.000		-		0.000	0.000	0.166	-
LDUUV Vehicles, Hardware, Design, & Demos	SS/CPFF	ARL PSU : State College, PA	30.977	1.000	Dec 2021	0.000		0.500	Jan 2024	-		0.500	0.000	32.477	-
LDUUV Vehicles, Hardware, Design, & Demos	WR	SSC Pacific : San Diego, CA	1.989	0.150	Oct 2021	0.000		0.000		-		0.000	0.000	2.139	-
LDUUV Vehicles, Hardware, Design, & Demos	WR	NUWC Keyport : Keyport, WA	16.706	3.000	Nov 2021	0.000		0.000		-		0.000	0.000	19.706	-
LDUUV Experimentation and Risk Reduction - Battery Certification	WR	NSWC Crane : Crane, IN	2.353	0.340	Nov 2021	0.000		0.000		-		0.000	0.000	2.693	-
LDUUV Platform Integration	Various	Various : Various	6.515	0.100	Feb 2022	0.000		0.000		-		0.000	0.000	6.615	-
LDUUV Risk Reduction Sonar	SS/CPFF	ARL UT : Austin, TX	0.551	0.000		0.000		0.000		-		0.000	0.000	0.551	-
FLEET Expirimentation	WR	NUWC NPT : Newport, RI	4.092	6.000	Dec 2021	0.000		0.000		-		0.000	0.000	10.092	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604031N / Large Unmanned Undersea Vehicles				Project (Number/Name) 2094 / Unmanned Underwater Vehicle					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
FLEET Expiration	SS/CPFF	ARL PSU : State College, PA	0.000	0.300	Jan 2022	0.000		0.000		-		0.000	0.000	0.300	-
FLEET Expiration	Various	Various : various	0.950	1.000	Oct 2021	0.000		0.000		-		0.000	0.000	1.950	-
Subtotal			189.541	24.260		0.000		5.800		-		5.800	Continuing	Continuing	N/A
Remarks FY22 - \$36.0M Above Threshold Reprogramming (ATR)															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
LDUUV Engineering Support	WR	NUWC Newport : Newport, RI	2.636	1.100	Nov 2021	0.000		0.000		-		0.000	0.000	3.736	-
LDUUV Launch and Recovery Engineering Support	WR	NSWC Panama City : Panama City, FL	0.306	0.000		0.000		0.000		-		0.000	0.000	0.306	-
LDUUV Hydrodynamics and Propulsion Engineering Support	C/CPFF	Various : Various	0.846	0.500	Nov 2021	0.000		0.000		-		0.000	0.000	1.346	-
LDUUV Hull and Propulsion Engineering Support	WR	NSWC Carderock : West Bethesda, MD	3.121	0.200	Nov 2021	0.000		0.000		-		0.000	0.000	3.321	-
LDUUV Command and Control Engineering Support	WR	SSC Pacific : San Diego, CA	1.380	0.150	Dec 2021	0.000		0.000		-		0.000	0.000	1.530	-
LDUUV Engineering Support	SS/CPFF	APL/JHU : Laurel, MD	1.635	0.000	Jan 2022	0.000		0.000		-		0.000	0.000	1.635	-
LDUUV ILS and Engineering Support	WR	NUWC Keyport : Keyport, WA	0.658	0.300	Nov 2021	0.000		0.525	Nov 2023	-		0.525	0.000	1.483	-
Subtotal			10.582	2.250		0.000		0.525		-		0.525	0.000	13.357	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604031N / Large Unmanned Undersea Vehicles						Project (Number/Name) 2094 / Unmanned Underwater Vehicle			
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
LDUUV Program Management	WR	NUWC Newport : Newport, RI	1.816	0.400	Nov 2021	0.000		0.250	Nov 2023	-		0.250	Continuing	Continuing	Continuing
LDUUV Program Management	Various	Various : Various	6.278	0.500	Dec 2021	0.000		0.250	Dec 2023	-		0.250	Continuing	Continuing	Continuing
LDUUV Travel	Various	NAVSEA : Washington, DC	0.497	0.100	Dec 2021	0.000		0.075	Dec 2023	-		0.075	Continuing	Continuing	Continuing
Subtotal			8.591	1.000		0.000		0.575		-		0.575	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			208.714	27.510		0.000		6.900		-		6.900	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy													Date: March 2023															
Appropriation/Budget Activity 1319 / 4													R-1 Program Element (Number/Name) PE 0604031N / Large Unmanned Undersea Vehicles				Project (Number/Name) 2094 / Unmanned Underwater Vehicle											
LDUUV	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
LDUUV Development																												
Experimentation Risk Reduction													Experimentation Risk Reduction and TRL Maturation															
Vehicle Refurbishment													Vehicle Refurbishment															
Restart Battery Certification Efforts													Restart Battery Certification Efforts															
VOO Demo													VOO Demo															
Continue Capability Demos													Continue Capability Demos															
Fleet Demos													Fleet Demos															
Design Reviews													Phase 1 TRR ▲															
Phase 1													Government Testing															

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604031N / Large Unmanned Undersea Vehicles	Project (Number/Name) 2094 / Unmanned Underwater Vehicle	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
LDUUV				
LDUUV Development: Experimentation Risk Reduction:	1	2022	4	2022
LDUUV Development: Vehicle Refurbishment: Schedule Detail	1	2024	3	2024
LDUUV Development: Restart Battery Certification Efforts: Schedule Detail	1	2024	4	2024
LDUUV Development: VOO Demo: Schedule Detail	1	2025	1	2025
LDUUV Development: Continue Capability Demos: Schedule Detail	1	2025	4	2026
LDUUV Development: Fleet Demos: Schedule Detail	1	2027	4	2028
Design Reviews: Phase 1 Test Readiness Review	1	2022	1	2022
Phase 1: Government Testing:	1	2022	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	584.157	117.878	116.498	118.182	-	118.182	78.504	95.504	106.139	55.900	Continuing	Continuing
2208: CVN 21	442.157	105.904	99.243	117.401	-	117.401	68.992	81.980	93.337	55.900	Continuing	Continuing
4004: EMALS	142.000	11.974	17.255	0.781	-	0.781	9.512	13.524	12.802	0.000	0.000	207.848
Program MDAP/MAIS Code: Project MDAP/MAIS Code(s): 223												
A. Mission Description and Budget Item Justification This Navy program addresses unique technologies on Ford Class carriers. The program includes: - (2208) - Development of ship hull, mechanical, propulsion, electrical, aviation, and combat support systems, subsystems and components to significantly improve aircraft carrier affordability, manpower requirements, survivability, and operational capabilities, and to meet the requirements of existing and pending regulations and statutes critical to the operation of existing and future aircraft carriers. - (4004) - Development of an advanced technology aircraft launch system in support of the CVN 78 Class design and construction schedule. The Electro Magnetic Aircraft Launch System (EMALS) will replace the current steam catapult on CVN 78 Class ships. EMALS provides better control of applied forces, both peak and transient dynamic, improved reliability and maintainability, increased operational availability and reduced operator and maintainer workload. This Program Element (PE) and associated projects represent a continuation of efforts previously funded under PE 0603512N projects 2208 and 4004 in FY 2014 and earlier. Project Unit (PU) 2208 now includes PUs 3179, 3108 and 4007 in FY 2024 and later, which are a continuation of efforts previously funded under Program Element (PE) 0604567N. Navy consolidated all Ford Class project units into one program element for improved transparency of all R&D efforts associated with the CVN 78 Class.												

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	121.509	116.498	45.574	-	45.574
Current President's Budget	117.878	116.498	118.182	-	118.182
Total Adjustments	-3.631	0.000	72.608	-	72.608
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.631	0.000			
• Program Adjustments	0.000	0.000	71.901	-	71.901
• Rate/Misc Adjustments	0.000	0.000	0.707	-	0.707
Change Summary Explanation					
2208 CVN 21 Cost:					
FY24 PROJ PU 2208: Addition of PUs 3179, 3108 and 4007 in FY 2024 and later from PE 0604567N (+\$40.1M)					
FY24 PROJ PU 2208: Added additional funds for Integrated Digital Shipbuilding (iDS) (+\$20.0M)					
FY24 PROJ PU 2208: Added additional funds for CVN 78 Class Developmental Testing (DT) / Operational Testing (OT) (+\$15.3M)					
4004 EMALS					
Cost: Program adjustments (-\$1.9M)					
Technical: N/A					
Schedule:					
Integrated Test & Evaluation (IT&E) end date moved from 1Q FY2022 to 2Q FY2022 to complete the top system safety issue for EMALS Block Switch Sensor (BSS), which was identified during CVN78 Post Delivery Test & Trials (PDT&T).					
Phased Depot Standup (Component & Overhaul) moved from Development to Sustainment.					
Depot Planning/Logistics Dev end date moved from 3Q 2023 to 1Q 2024 to include Depot Overhaul Capability efforts.					
Added Automated Software Testing in 1Q FY2024 through 4Q FY2026.					
Added Electrical Isolation Development starting 1Q FY2025 through 4Q FY2027.					
CVN 79 events were updated to reflect the most current Post Delivery Test & Trials (PDT&T) ship schedule.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80				Project (Number/Name) 2208 / CVN 21			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2208: CVN 21	442.157	105.904	99.243	117.401	-	117.401	68.992	81.980	93.337	55.900	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 223												
Note Project Unit (PU) 2208 now includes PUs 3179, 3108, and 4007 in FY 2024 and later, which are a continuation of efforts previously funded under Program Element (PE) 0604567N. FY 2023 R2A Category "CVN 21 - Test and Evaluation (T&E)" has been renamed to "CVN 78 Class Test & Evaluation (T&E)." FY 2023 R2A Category "Integrated Digital Shipbuilding (iDS)" has been renamed to "CVN 78 Class Digital Transformation."												
A. Mission Description and Budget Item Justification This project provides the development of aircraft carrier specific technologies, the infusion of the ship technology base into existing and future aircraft carriers, and the potential realization of subsystem design capabilities not currently feasible. All systems developed in this project support current or emerging requirements and other promising systems technologies for insertion into existing and new aircraft carrier designs. The emphasis is directed toward developing ship hull, mechanical, propulsion, electrical, aviation, and warfare systems to significantly improve aircraft carrier affordability, manpower requirements, survivability, and operational capabilities required to meet existing and pending regulations and statutes critical to the operation of future aircraft carriers. This project also encompasses those tasks required to support CVN 78 Class procurement, including, but not limited to engineering support, programmatic and program support, logistics support, modeling and simulation, test and evaluation, manpower and program related studies, and design support systems, such as the Integrated Digital Environment (IDE).												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)							FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	
Title: CVN 78 Class Digital Transformation							53.000	86.243	46.247	0.000	46.247	
Articles:							-	-	-	-	-	
Description: CVN 78 Class Digital Transformation - to develop, refine, and implement digital structures such as the FORD class product model, Integrated Digital Shipbuilding (iDS), and cloud based product exchanges.												
FY 2023 Plans: Continue CVN 80/81 FY23 Integrated Digital Shipbuilding implementation plan and execute the installment plan of the total contract by the Navy. These efforts are directly tied to the construction trade products needed to support the build sequence in the shops and on the waterfront. Failure to fully fund installment clause would result in a change to the contract as funding requirements would not be met. HII-NNS will continue to apply upgrades to their Product Lifecycle Management (PLM) toolsets, Product Data Management (PDM)												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80		Project (Number/Name) 2208 / CVN 21		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
methodology, and other resource planning software in order to support developing toolset integration, new business processes, and overall shipbuilding efficiency increase. Continue to support engineering efforts to define and add product manufacturing information into the Product Model to allow design disclosure to the Navy and digital disclosure of work instructions and related technical references on tablet computers for the trades to use in the construction of CVN 80/81. Continue planning efforts to develop visual work instructions for manufacturing and constructions Trades. Continue to develop visual build management plans and Critical Chain Project Plans (CCPP) that will enable development of efficiently sequenced build plans. FY 2024 Base Plans: Continue CVN 80/81 FY24 Integrated Digital Shipbuilding (iDS) implementation plan and execute the installment schedule per the contract. This effort will enable HII-NNS to achieve 2-ship-buy savings and drive the modernization of the shipbuilding base. iDS Products are directly tied to construction needs and are issued to the individual trades which utilize them on the deckplate to support the CVN 80/81 build on the waterfront. Failure to fully fund installment clause would result in a change to the contract as funding requirements would not be met. HII-NNS is continually looking at ways to increase efficiency of developing iDS products through upgrades to their Product Lifecycle Management (PLM) toolsets, Model Based Enterprise methodology, and other resource planning software. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: The decrease in FY 2024 supports the contractual installments with the shipbuilder.						
Title: CVN 78 Class Test & Evaluation (T&E) <div>Articles:</div> Description: Test and Evaluation includes test planning, system modeling and simulation, incorporating laboratory and land based facilities support, conducting test events, and evaluating and documenting test results. Title 10, US Code, Section 2366 also requires survivability assessment; for the CVN 78 Class this entails testing, analysis, and documentation. T&E results in refinement of future FORD Class capabilities and survivability, system analysis, verification and validation of requirements, and fulfilling statutory requirements. FY 2023 Plans: Conclude Consolidated Test Working Group (CTWG), and Carrier Integrated Test Team (CITT) efforts upon completion of the final phase of Developmental Testing (DT/IT-5). Conduct the first phase of Operational		37.904 -	13.000 -	24.967 -	0.000 -	24.967 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80		Project (Number/Name) 2208 / CVN 21		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Testing (OT-C1). OT-C1 test events include lab-based cyber survivability testing, interoperability data collection, and collection of OT data. Begin planning to support the Sortie Generation Rate demonstration event. Continue to collect reliability data on new and legacy systems. Continue to monitor corrective actions and track installation and performance on ship. FY 2024 Base Plans: Finalize Operational Testing (OT) on CVN 78. Conduct platform combat systems testing against high-speed surface targets. Plan and execute CVN 78 platform cyber survivability test event. Continue reliability, availability, and maintainability (RAM) studies on CVN 78 class. Complete Total Ship Survivability Trial (TSST) Reporting to assess and improve ship systems recoverability against simulated damage from realistic threats. Complete survivability modeling improvements, analyses and documentation and the final Survivability Analysis Report (SAR). Continue to collect reliability data on new and legacy systems. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: The increase in FY 2024 is due to the consolidation of the Live Fire Test & Evaluation (LFT&E) Project Unit 4007 from PE 0604567N. Additionally, FY 2024 funding is needed to execute Operational Test events and the Total Ship Survivability Trial on CVN 78.						
Title: CVN 78 Class Transformation and Affordability <div>Articles:</div> Description: Investments in technology insertion to assist in stabilizing the supply chain, reducing the cost of production, improving industrial capacity, increasing supplier throughput, reducing schedule risk, improving material quality and performance specifications. These investments provide opportunities to incorporate affordability into the design, engineering, manufacturing and overhead of future Aircraft Carriers. FY 2023 Plans: N/A FY 2024 Base Plans: Provide support for cyber related penetration testing for shipboard systems. Support for topside activities. Design and development of new Land Based Testing Facility (LBTF) to support Programmable Logic Controllers (PLCs)		0.000 -	0.000 -	14.362 -	0.000 -	14.362 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80		Project (Number/Name) 2208 / CVN 21		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
for propulsion system monitoring. Development of cost saving initiatives, process improvements, business case analyses, and design for affordability initiatives to continue to drive affordability into the carrier program.						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: The increase is due to the consolidation of efforts previously funded under PU 3108 PE 0604567N along with new FY 2024 specific tasking: cyber penetration efforts, topside activity support, and design and development of new LBTF to support PLC's for propulsion system monitoring.						
Title: CVN 78 Class Systems Analysis & Total Ship Integration		0.000	0.000	31.825	0.000	31.825
Articles:		-	-	-	-	-
Description: Integrate mission systems into platform design, while also addressing fact-of-life configuration changes from obsolescence, advances in technology, late and/or poor quality material, and other adverse program impacts to mitigate cost, schedule or performance risk. This includes divestments in legacy technologies and materials, which offset forward pricing rates in procurement, and feasibility and tradeoff studies that enhance naval capability and reduce total ownership cost.						
FY 2023 Plans: N/A						
FY 2024 Base Plans: Continue to perform technical analysis and engineering calculations in support of validating Technical Performance Measures (TPMs), System/Component, Environmental Safety and Health Qualification, and Human Factors Engineering, Ship/System/Component Survivability and Vulnerability Qualification, System/Component Shock and Vibration Qualification, and other miscellaneous system related calculations. Continue to address design and construction issues, and technically resolve class system integration issues based on the results of CVN 78 testing and initial operations. Refine system integration and testing strategies for implementation testing by evaluating improvements needed to capitalize on CVN 78 lessons learned. Manage and resolve fact-of-life obsolescence changes on government-furnished equipment and contractor-furnished equipment systems to support construction. Continue conducting and supporting feasibility and tradeoff studies on new and modified shipboard systems and equipment.						
FY 2024 OCO Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80		Project (Number/Name) 2208 / CVN 21		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: The increase is due to the consolidation of efforts previously funded under PU 3108 and PU 3179 from PE 0604567N, along with an increase to conduct software analysis and compatibility studies, complete FORD Class component shock qualification program, and perform design and feasibility studies related to configuration changes.						
Title: CVN 78 Full Ship Shock Trial (FSST) Articles: Description: No efforts for FSST are required after FY22. FY 2023 Plans: N/A FY 2024 Base Plans: N/A FY 2024 OCO Plans: N/A		12.000 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: CVN 78 Class Advanced Technology Design & Development Articles: Description: No efforts for CVN 78 Class Advanced Technology Design & Development are required after FY22. FY 2023 Plans: N/A FY 2024 Base Plans: N/A FY 2024 OCO Plans: N/A		3.000 -	0.000 -	0.000 -	0.000 -	0.000 -
Accomplishments/Planned Programs Subtotals		105.904	99.243	117.401	0.000	117.401

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80				Project (Number/Name) 2208 / CVN 21				
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
• RD TEN / 0604567N: Project Units 3108, 3179, 4007	42.563	45.717	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	572.789	
• SCN / 2001: Carrier Replacement Program	1,062.205	1,465.880	1,115.296	-	1,115.296	2,416.717	1,159.211	1,842.376	2,119.562	Continuing	Continuing	
• SCN / 2004: CVN 81	1,287.719	1,052.024	800.492	-	800.492	666.045	1,922.144	2,011.766	1,724.982	0.000	12,929.104	
• SCN / 5300: Completion of PY Shipbldg Progr	291.000	461.700	624.600	-	624.600	0.000	0.000	0.000	0.000	0.000	1,377.300	
• OPN / 5664: Surface Training Equipment	2.475	2.468	2.430	-	2.430	2.497	2.664	2.722	2.780	Continuing	Continuing	
• OMN / 1B2B: CVN 78 Ford Class Training and Sustainment	5.176	5.601	6.064	-	6.064	6.167	6.245	6.281	6.253	Continuing	Continuing	
• OMN / 1B5B: Ford Class PCU Housing	1.100	11.818	15.587	-	15.587	5.100	0.800	10.600	10.812	Continuing	Continuing	
Remarks												
D. Acquisition Strategy												
The CVN 78 Class of aircraft carriers is designed to replace USS ENTERPRISE and the ships of the NIMITZ Class. The CVN 78 Class features a new nuclear propulsion and electrical generation/distribution system, Electro Magnetic Aircraft Launch System (EMALS), Advanced Arresting Gear (AAG) system, all electric auxiliaries, warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the NIMITZ Class. Additionally, the following war fighting benefits will be realized: increased sortie generation rate, improved ship self-defense capability, increased launch and recovery capability/flexibility, increased operational availability, and increased flexibility to support future upgrades.												

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80				Project (Number/Name) 2208 / CVN 21					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Digital Shipbuilding	C/CPAF	HII : VA	93.965	53.000	Nov 2021	86.243	Nov 2022	46.247	Nov 2023	-		46.247	Continuing	Continuing	Continuing
Class Transformation and Affordability	Various	NSWC PHILADELPHIA : PA	0.000	0.000		0.000		10.150	Nov 2023	-		10.150	Continuing	Continuing	Continuing
Class Transformation and Affordability	Various	VARIOUS : VARIOUS	0.000	0.000		0.000		4.212	Nov 2023	-		4.212	Continuing	Continuing	Continuing
Systems Analysis & Total Ship Integration	C/CPFF	GRYPHON : DC	0.000	0.000		0.000		2.225	Nov 2023	-		2.225	Continuing	Continuing	Continuing
Systems Analysis & Total Ship Integration	WR	NAWC PATUXENT RIVER : MD	0.000	0.000		0.000		1.250	Nov 2023	-		1.250	Continuing	Continuing	Continuing
Systems Analysis & Total Ship Integration	C/CPFF	CACI : DC	0.000	0.000		0.000		5.500	Nov 2023	-		5.500	0.000	5.500	-
Systems Analysis & Total Ship Integration	C/CPAF	HII : VA	0.000	0.000		0.000		20.262	Nov 2023	-		20.262	Continuing	Continuing	Continuing
Systems Analysis & Total Ship Integration	Various	VARIOUS : VARIOUS	0.000	0.000		0.000		2.588	Nov 2023	-		2.588	Continuing	Continuing	Continuing
Advanced Design & Development	C/CPAF	HII : VA	32.266	0.230	Nov 2021	0.000		0.000		-		0.000	0.000	32.496	-
Advanced Design & Development	WR	NSWC DAHLGREN : VA	7.781	1.300	Nov 2021	0.000		0.000		-		0.000	0.000	9.081	-
Advanced Design & Development	WR	NSWC PHILADELPHIA : PA	22.495	1.120	Nov 2021	0.000		0.000		-		0.000	0.000	23.615	-
Advanced Design & Development	C/CPFF	GRYPHON : DC	0.352	0.350	Nov 2021	0.000		0.000		-		0.000	0.000	0.702	-
Prior Year AD&D No Longer Funded in the FYDP	Various	VARIOUS : VARIOUS	84.386	0.000		0.000		0.000		-		0.000	0.000	84.386	-
Subtotal			241.245	56.000		86.243		92.434		-		92.434	Continuing	Continuing	N/A

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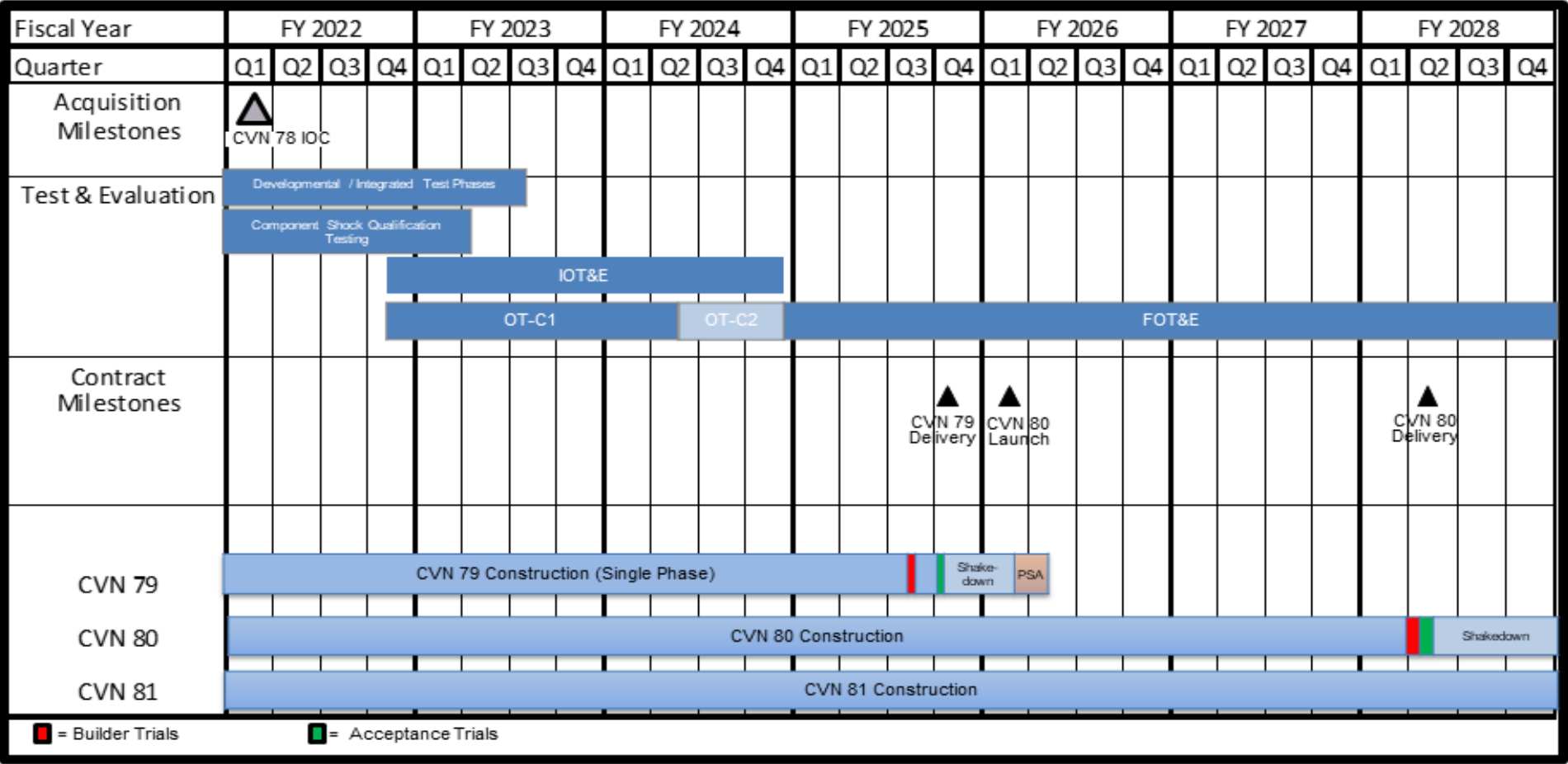
Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80				Project (Number/Name) 2208 / CVN 21					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	C/CPAF	HII : VA	11.057	1.131	Nov 2021	0.000		0.000		-		0.000	0.000	12.188	-
Developmental Test & Evaluation (DT&E)	WR	NAWC PATUXENT RIVER : MD	4.153	0.174	Nov 2021	0.000		0.000		-		0.000	0.000	4.327	-
Developmental Test & Evaluation (DT&E)	WR	NSWC DAHLGREN : VA	15.067	3.742	Nov 2021	2.700	Nov 2022	4.792	Nov 2023	-		4.792	0.000	26.301	-
Developmental Test & Evaluation (DT&E)	WR	NSWC CARDEROCK : MD	2.481	1.166	Nov 2021	0.400	Nov 2022	0.000		-		0.000	0.000	4.047	-
Developmental Test & Evaluation (DT&E)	Various	MISCELLANEOUS : VARIOUS	5.848	2.385	Nov 2021	0.380	Nov 2022	2.510	Nov 2023	-		2.510	0.000	11.123	-
Developmental Test & Evaluation (DT&E)	C/BA	NSWC PORT HUENEME : CA	2.934	8.628	Nov 2021	0.000		0.000		-		0.000	0.000	11.562	-
Developmental Test & Evaluation (DT&E)	C/BA	NSWC CORONA : CA	0.263	0.592	Nov 2021	0.000		0.000		-		0.000	0.000	0.855	-
Developmental Test & Evaluation (DT&E)	WR	NAWC LAKEHURST : NJ	12.358	1.741	Nov 2021	1.300	Nov 2022	1.765	Nov 2023	-		1.765	0.000	17.164	-
Operational Test & Evaluation (OT&E)	WR	COMOPTEVFOR : VA	15.011	18.345	Nov 2021	5.400	Nov 2022	9.331	Nov 2023	-		9.331	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	WR	NAWC PATUXENT RIVER : MD	0.213	0.000		0.400	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	Various	MISCELLANEOUS : VARIOUS	0.000	0.000		0.500	Nov 2022	0.895	Nov 2023	-		0.895	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	WR	NSWC PHILADELPHIA : PA	0.000	0.000		1.120	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	C/CPFF	GRYPHON : DC	0.000	0.000		0.300	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	WR	NSWC CORONA : CA	0.000	0.000		0.500	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Live Fire Test & Evaluation (LFT&E)	Various	MISCELLANEOUS : VARIOUS	0.000	0.000		0.000		2.559	Nov 2023	-		2.559	Continuing	Continuing	Continuing
Live Fire Test & Evaluation (LFT&E)	C/CPFF	BECHTEL : PA	9.132	0.400	Nov 2021	0.000		0.000		-		0.000	0.000	9.532	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80				Project (Number/Name) 2208 / CVN 21					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Live Fire Test & Evaluation (LFT&E)	WR	NAWC PATUXENT RIVER : MD	5.944	0.330	Nov 2021	0.000		0.000		-		0.000	0.000	6.274	-
Live Fire Test & Evaluation (LFT&E)	WR	NSWC DAHLGREN : VA	1.844	0.150	Nov 2021	0.000		0.000		-		0.000	0.000	1.994	-
Live Fire Test & Evaluation (LFT&E)	WR	NSWC CARDEROCK : MD	37.884	1.116	Nov 2021	0.000		3.115	Nov 2023	-		3.115	0.000	42.115	-
Live Fire Test & Evaluation (LFT&E)	WR	NSWC PHILADELPHIA : PA	12.634	0.204	Nov 2021	0.000		0.000		-		0.000	0.000	12.838	-
Live Fire Test & Evaluation (LFT&E)	C/CPAF	HII : VA	18.729	9.800	Nov 2021	0.000		0.000		-		0.000	0.000	28.529	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	Various	VARIOUS : VARIOUS	38.280	0.000		0.000		0.000		-		0.000	0.000	38.280	-
Prior Year Live Fire Test & Evaluation Not Funded FYDP (PYLFT&E)	Various	VARIOUS : VARIOUS	7.080	0.000		0.000		0.000		-		0.000	0.000	7.080	-
Subtotal			200.912	49.904		13.000		24.967		-		24.967	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			442.157	105.904		99.243		117.401		-		117.401	Continuing	Continuing	N/A
Remarks															

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																	Date: March 2023				
Appropriation/Budget Activity 1319 / 4										R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80							Project (Number/Name) 2208 / CVN 21				

Gerald R. Ford Class Carriers



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80	Project (Number/Name) 2208 / CVN 21

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2208				
CVN 21	1	2022	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80				Project (Number/Name) 4004 / EMALS			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
4004: EMALS	142.000	11.974	17.255	0.781	-	0.781	9.512	13.524	12.802	0.000	0.000	207.848
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 223												
A. Mission Description and Budget Item Justification												
This project provides for the development of an advanced technology aircraft launch system in support of the CVN 78 design and construction schedule, as well as Engineering and Life Cycle System (E&LCS) design. The Electromagnetic Aircraft Launch System (EMALS) will be the aircraft catapult for CVN 78 Class ships. EMALS provides better control of applied forces, both peak and transient dynamic, improved reliability and maintainability, increased operational availability, and reduced operator and maintainer workload.												
The EMALS program will undergo future development efforts for system improvements. Automated software testing development provides for rapid, repeatable tests, resulting in higher quality software. Automated testing enables rapid diagnosis of system faults and decrease troubleshooting response time for the fleet. EMALS is a software intensive system and highly dependent on reliable software operation. The readiness and mission benefits include the ability to provide the fleet with affordable, quality, well-tested software capable of launching and recovering aircraft on Ford-Class carriers.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: EMALS Articles: Description: EMALS FY 2023 Plans: Complete Ready for Training. Complete depot planning and analysis for component repairs, and perform logistics development for depot overhaul capability and high failure component repair validation. FY 2024 Base Plans: Begin Primary Software Development for Automated Software Testing. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement:								11.974	17.255	0.781	0.000	0.781
								-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80			Project (Number/Name) 4004 / EMALS

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Decrease from FY 2023 to FY 2024 due to the completion of EMALS Depot logistics and training efforts.					
Accomplishments/Planned Programs Subtotals	11.974	17.255	0.781	0.000	0.781

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• RD TEN / 0604567N: <i>Project Units 3108, 3179, 4007</i>	42.563	45.717	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• SCN / 2001: <i>Carrier Replacement Program</i>	1,062.205	1,465.880	1,115.296	-	1,115.296	2,416.717	1,159.211	1,842.376	2,119.562	Continuing	Continuing
• OMN / 1B2B: <i>CVN 78 Ford Class Training and Sustainment (12BJ0)</i>	5.176	5.601	6.064	-	6.064	6.167	6.245	6.281	6.253	Continuing	Continuing
• OPN / 5664: <i>Surface Training Equipment</i>	2.475	2.468	2.430	-	2.430	2.497	2.664	2.722	2.780	Continuing	Continuing
• OPN / 4213: <i>Aircraft Support Equipment</i>	176.387	272.044	162.273	-	162.273	117.925	97.652	97.973	98.420	Continuing	Continuing
• SCN / 2004: <i>CVN 81</i>	1,287.719	1,052.024	800.492	-	800.492	666.045	1,922.144	2,011.766	1,724.982	0.000	12,929.104
• SCN / 5300: <i>Completion of PY Shipbldg Progr</i>	291.000	461.700	624.600	-	624.600	0.000	0.000	0.000	0.000	0.000	1,377.300
• OMN / 1B5B: <i>Ford Class PCU Housing</i>	1.100	11.818	15.587	-	15.587	5.100	0.806	10.600	10.812	Continuing	Continuing
• OPN/4219: <i>Electromagnetic Aircraft Launch System (EMALS)</i>	0.000	18.594	17.836	-	17.836	20.958	21.211	20.614	20.700	44.265	164.178

Remarks

OPN 4213 includes a portion of line item funding for EMALS through FY23.

D. Acquisition Strategy

The CVN 78 is the first ship of the CVN 78 Class of aircraft carriers designed to replace the ships of the NIMITZ Class. The CVN 78 will feature a new nuclear propulsion and electrical generation/distribution system, new electromagnetic aircraft launching system (EMALS), advanced arresting gear (AAG) system, all electric auxiliaries, warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the NIMITZ Class. Additionally, the following war fighting benefits will be realized: increased sortie

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80	Project (Number/Name) 4004 / EMALS
generation rate, improved ship self-defense capability, increased launch and recovery capability/flexibility, increased operational availability, and increased flexibility to support future upgrades.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80						Project (Number/Name) 4004 / EMALS			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Cost No Longer Funded in FYDP	Various	Various : Various	72.826	0.000		0.000		0.000		-		0.000	0.000	72.826	24.589
Primary SW Development - Automated Software Testing	WR	NAWCAD Lakehurst : Lakehurst, NJ	0.000	0.000		0.000		0.781	Nov 2023	-		0.781	1.488	2.269	-
Subtotal			72.826	0.000		0.000		0.781		-		0.781	1.488	75.095	N/A
Remarks FY 2024 Primary SW Dev increase is to begin development of Automated Software Testing capability.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Training Support	WR	NAWCAD TSD : Orlando, FL	1.281	0.196	Nov 2021	0.000		0.000		-		0.000	0.000	1.477	-
Depot Logistics Development	C/CPFF	General Atomics : San Diego, CA	18.319	6.021	Nov 2021	2.440	Nov 2022	0.000		-		0.000	0.000	26.780	25.231
Government Eng Support	WR	NAWCAD Lakehurst : Lakehurst, NJ	3.275	1.646	Nov 2021	2.413	Nov 2022	0.000		-		0.000	0.000	7.334	-
Depot Logistics Development (Overhaul Capability)	C/CPFF	General Atomics : San Diego, CA	0.000	4.111	Apr 2022	11.313	Nov 2022	0.000		-		0.000	0.000	15.424	-
Training Support	C/FFP	General Atomics : San Diego, CA	0.000	0.000		0.367	Nov 2022	0.000		-		0.000	0.000	0.367	-
Training Support	WR	NAWCAD Lakehurst : Lakehurst, NJ	0.000	0.000		0.722	Nov 2022	0.000		-		0.000	0.000	0.722	-
Prior Year Cost No Longer Funded in FYDP	Various	Not Specified : Not Specified	1.319	0.000		0.000		0.000		-		0.000	0.000	1.319	-
Subtotal			24.194	11.974		17.255		0.000		-		0.000	0.000	53.423	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80						Project (Number/Name) 4004 / EMALS			
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks Decrease from FY 2023 to FY 2024 due to the completion of EMALS Depot logistics and training efforts.															
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	Various	Various : Various	44.980	0.000		0.000		0.000		-		0.000	0.000	44.980	-
Subtotal			44.980	0.000		0.000		0.000		-		0.000	0.000	44.980	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			142.000	11.974		17.255		0.781		-		0.781	1.488	173.498	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

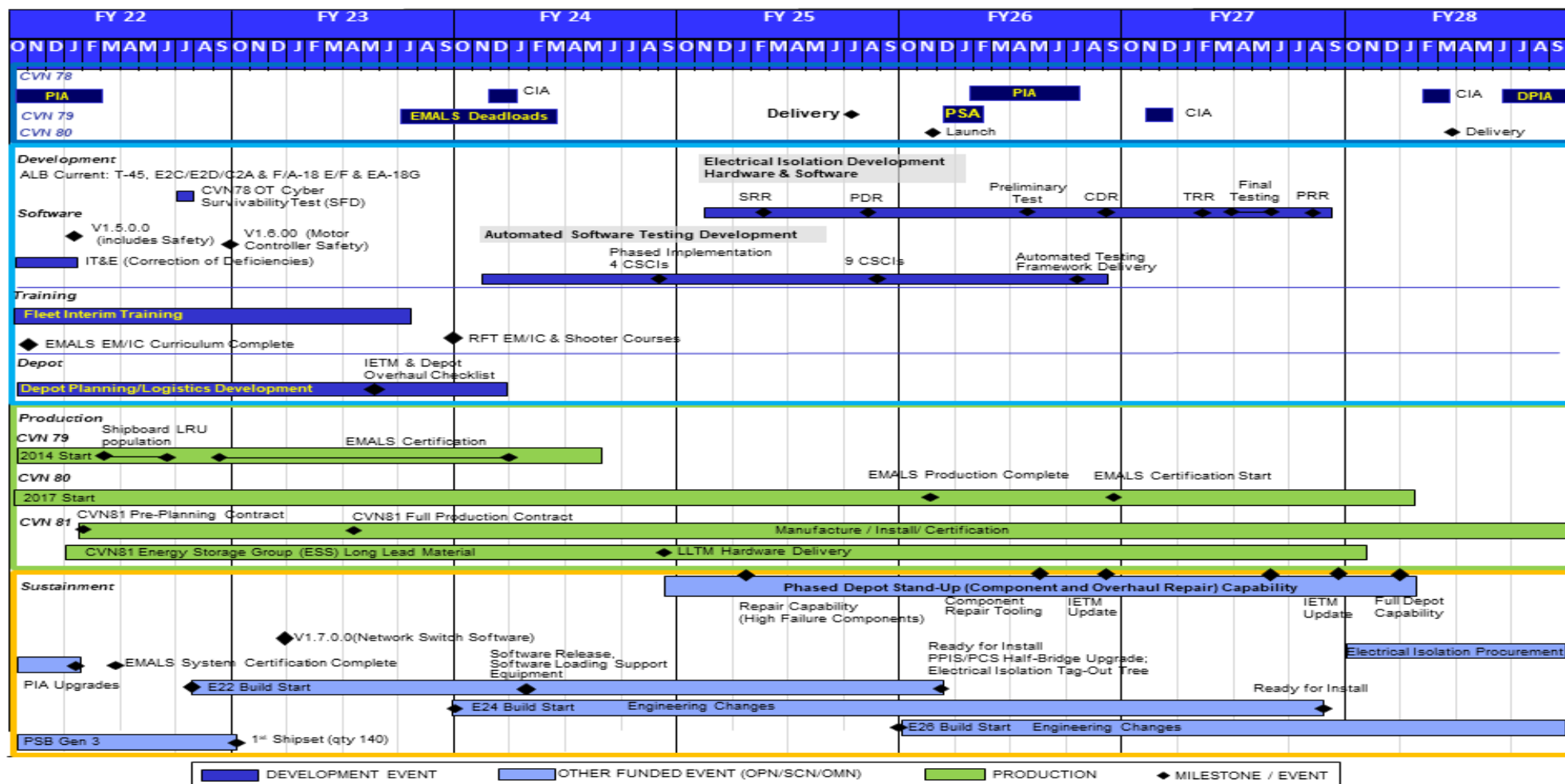
R-1 Program Element (Number/Name)

PE 0604112N / GERALD R FORD CI NUC

AIRCRAFT CARRIER CVN 78-80

Project (Number/Name)

4004 / EMALS



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604112N / GERALD R FORD CI NUC AIRCRAFT CARRIER CVN 78-80		Project (Number/Name) 4004 / EMALS

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 4004				
Training: EMALS Interim Training	1	2022	4	2023
Depot Development: EMALS Depot Planning/Logistics Dev	1	2022	4	2023
Test and Evaluation: EMALS Integrated Test & Evaluation (IT&E)	1	2022	2	2022
Test and Evaluation: EMALS Automated SW Testing	1	2024	4	2026
Test and Evaluation: EMALS Electrical Isolation	1	2025	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
1319: <i>Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>					PE 0604126N I Airborne Mine Countermeasures							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	55.465	18.067	30.240	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	103.772
2131: <i>Assault Breaching System</i>	55.465	18.067	30.240	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	103.772

A. Mission Description and Budget Item Justification

FY 2024 reflects a net decrease of \$63.988 million. Decrease is associated with the COBRA Block II program termination. Upon sundown of the MQ-8B unmanned airborne vehicle in FY 2022, began integrating COBRA Block I with MQ-8C UAV in Q3 FY 2023.

The Assault Breaching System (ABS) program provides a combination of U.S. Navy systems to counter the threat to amphibious forces from obstacles and anti-landing/ sea mines in the Beach Zone and Surf Zone (0-10 ft water).

The Assault Breaching Systems (ABS) consist of a system of systems approach that includes the following programs: Joint Direct Attack Munition (JDAM) Assault Breaching System (JABS); Coastal Battlefield Reconnaissance and Analysis (COBRA); Precision Navigation and Marking System (PNMS); Command, Control, Computers, Communications, and Intelligence (C4I). The Assault Breaching Systems enable the Navy-Marine Corps team to conduct Joint Forcible Entry Operations (JFEO), Ship-To-Objective Maneuver (STOM), and other combat operations to project power ashore. JABS is a fielded system that neutralizes surface mines and obstacles in the Beach Zone (BZ) and Surf Zone (SZ). The ABS Tactical Decision Aid optimizes the Desired Points of Impact (DPI) for JDAM munitions to effectively neutralize mines and obstacles while minimizing the required number of munitions and friendly aircraft sorties. Continued testing is required to optimize the ABS Tactical Decision Aid database for the most common enemy mines and obstacles. COBRA conducts Intelligence Surveillance Reconnaissance and Targeting (ISR/T). This system, which consists of two COBRA Airborne Payloads (CAPS) and one Post Mission Analysis (PMA) station, provides Coastal Mine Reconnaissance (CMR) capability. Block I is a multispectral sensor capable of daytime detection of surface-laid minefields and obstacles in the Beach Zone (BZ) and has on-board real-time processing. Block II capability adds an active illuminator sensor that enables nighttime detection of mines and obstacles in the BZ and the Surf Zone (SZ) (0-10 ft of water), and will detect, classify, and localize mines in the Very Shallow Water (0 - 40 ft of water) and near-surface moored and drifting sea mines. COBRA consists of a modular payload architecture that is integrated onto the MQ-8 Fire Scout, other vessels of opportunity, and in its expeditionary configuration, from the shore. COBRA will serve in the CMR mission module for the SZ and BZ in the Littoral Combat Ship (LCS) Mine Countermeasures (MCM) Mission Package. PNMS provides navigational upgrades for the Landing Craft, Air Cushion (LCAC); Landing Craft, Utility (LCU); and Amphibious Assault Vehicle (AAV). A system of virtual lane marking improved the navigation ability of these two assault craft which enables them to navigate safely through the neutralized assault lanes provided by JABS. LCU Navigation Upgrade provides modernized navigation system to enable safe transit through the breach lane. LCAC autopilot upgrade provides an integrated improvement to the LCAC Service Life Extension Program (SLEP) navigation system for craft control to allow precise navigation and hovering within the breach lane. These software upgrades and backfits occur during scheduled LCAC SLEPs. AAV Navigation Upgrade will provide modernized navigation system to enable precise transit through the breach lane. C4I system will tie all of the above systems together under an integrated ABS architecture that is compatible with the existing Mine Warfare architecture.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0604126N I Airborne Mine Countermeasures			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	18.669	47.389	63.988	-	63.988
Current President's Budget	18.067	30.240	0.000	-	0.000
Total Adjustments	-0.602	-17.149	-63.988	-	-63.988
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-17.149			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.602	0.000			
• Program Adjustments	0.000	0.000	-63.988	-	-63.988
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000
Change Summary Explanation					
FY 2022 reflects a net decrease of \$602K for SBIR assessments.					
FY 2023 reflects a net decrease of \$17,149K Congressional adjustment due to COBRA Block II Engineering and Manufacturing Development delay.					
FY 2024 reflects a net decrease of \$63,988K due to COBRA Block II termination.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy									Date: March 2023			
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604126N / Airborne Mine Countermeasures				Project (Number/Name) 2131 / Assault Breaching System			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2131: Assault Breaching System	55.465	18.067	30.240	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	103.772
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The Assault Breaching System (ABS) program provides a combination of U.S. Navy systems to counter the threat to amphibious forces from obstacles and anti-landing/ sea mines in the Beach Zone and Surf Zone (0-10 ft water). The Assault Breaching Systems (ABS) consist of a system of systems approach that includes the following programs: Joint Direct Attack Munition (JDAM) Assault Breaching System (JABS); Coastal Battlefield Reconnaissance and Analysis (COBRA); Precision Navigation and Marking System (PNMS); Command, Control, Computers, Communications, and Intelligence (C4I). The Assault Breaching Systems enable the Navy-Marine Corps team to conduct Joint Forcible Entry Operations (JFEO), Ship-To-Objective Maneuver (STOM), and other combat operations to project power ashore.												
JABS is a fielded system that neutralizes surface mines and obstacles in the Beach Zone (BZ) and Surf Zone (SZ). The ABS Tactical Decision Aid optimizes the Desired Points of Impact (DPI) for JDAM munitions to effectively neutralize mines and obstacles while minimizing the required number of munitions and friendly aircraft sorties. Continued testing is required to optimize the ABS Tactical Decision Aid database for the most common enemy mines and obstacles.												
COBRA conducts Intelligence Surveillance Reconnaissance and Targeting (ISR/T). This system, which consists of two COBRA Airborne Payloads (CAPS) and one Post Mission Analysis (PMA) station, provides Coastal Mine Reconnaissance (CMR) capability. Block I is a multispectral sensor capable of daytime detection of surface-laid minefields and obstacles in the Beach Zone (BZ) and has on-board real-time processing. Block II capability adds an active illuminator sensor that enables nighttime detection of mines and obstacles in the BZ and the Surf Zone (SZ) (0-10 ft of water), and will detect, classify, and localize mines in the Very Shallow Water (0 - 40 ft of water) and near-surface moored and drifting sea mines. COBRA consists of a modular payload architecture that is integrated onto the MQ-8 Fire Scout, other vessels of opportunity, and in its expeditionary configuration, from the shore. COBRA will serve in the CMR mission module for the SZ and BZ in the Littoral Combat Ship (LCS) Mine Countermeasures (MCM) Mission Package. PNMS provides navigational upgrades for the Landing Craft, Air Cushion (LCAC); Landing Craft, Utility (LCU); and Amphibious Assault Vehicle (AAV). A system of virtual lane marking improved the navigation ability of these two assault craft which enables them to navigate safely through the neutralized assault lanes provided by JABS. LCU Navigation Upgrade provides modernized navigation system to enable safe transit through the breach lane. LCAC autopilot upgrade provides an integrated improvement to the LCAC Service Life Extension Program (SLEP) navigation system for craft control to allow precise navigation and hovering within the breach lane. These software upgrades and back-fits occur during scheduled LCAC SLEPs. AAV Navigation Upgrade will provide modernized navigation system to enable precise transit through the breach lane. C4I system will tie all of the above systems together under an integrated ABS architecture that is compatible with the existing Mine Warfare architecture.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)							FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	
Title: Product Development							12.452	13.849	0.000	0.000	0.000	
Articles:							-	-	-	-	-	

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604126N / Airborne Mine Countermeasures		Project (Number/Name) 2131 / Assault Breaching System		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
FY 2023 Plans: COBRA BLOCK I: - Commence COBRA Block I / MQ-8C Fire Scout Integration design and development to include System Requirements Review / System Functional Review and Preliminary Design Review (PDR) / Critical Design Review (CDR). - Complete COBRA Block I Hardware Development and Obsolescence Upgrades. COBRA BLOCK II: - Complete initial development of tech data, interface control documents, safety documents and test & evaluation planning. - Complete program documentation updates (system/subsystem specification and interface control documents). JABS: - Continue design and engineering of weapon effectiveness for BZ and SZ modeling, simulation and testing. FY 2024 Base Plans: N/A FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: FY 2023 to FY 2024 decrease is due to COBRA Block II program termination.						
Title: Technical Support <div>Articles:</div>		2.398 -	5.716 -	0.000 -	0.000 -	0.000 -
FY 2023 Plans: COBRA BLOCK I: - Continue to provide management and shipping, contract and test/studies, C4I Data Fusion. - Provide technical support and documentation (data collection / demonstration events and drawings). COBRA BLOCK II: - Complete COBRA Block II Final Technology Readiness Assessment. FY 2024 Base Plans: N/A FY 2024 OCO Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604126N / Airborne Mine Countermeasures		Project (Number/Name) 2131 / Assault Breaching System		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: FY 2023 to FY 2024 decrease is due to COBRA Block II program termination.						
Title: Test and Evaluation		0.347	7.675	0.000	0.000	0.000
Articles:		-	-	-	-	-
FY 2023 Plans: COBRA Block I: - Perform and complete flight demonstration / data collection of COBRA Block I Upgrades. - Perform and complete COBRA Block I / MQ-8C integration flight tests. COBRA Block II: N/A JABS: - Conduct SZ and BZ characterization testing.						
FY 2024 Base Plans: N/A						
FY 2024 OCO Plans: N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: FY 2023 to FY 2024 decrease is associated with the completion of JABS testing and COBRA Block II program termination.						
Title: Management		2.870	3.000	0.000	0.000	0.000
Articles:		-	-	-	-	-
FY 2023 Plans: COBRA: - Continue contract and financial management support. JABS: - Continue to manage Mine magazine inventory management and shipping, contract management and tests/ studies, C4I/Data fusion.						
FY 2024 Base Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023							
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604126N / Airborne Mine Countermeasures		Project (Number/Name) 2131 / Assault Breaching System							
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)											
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total					
N/A											
FY 2024 OCO Plans: N/A											
FY 2023 to FY 2024 Increase/Decrease Statement: FY 2023 to FY 2024 decrease is due to COBRA Block II program termination.											
Accomplishments/Planned Programs Subtotals		18.067	30.240	0.000	0.000	0.000					
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• OPN/2624: SHALLOW WATER Mine CM SHIP	5.610	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	83.428
Remarks											
D. Acquisition Strategy											
Countermine/Counter Obstacle (CM/CO) JDAM Assault Breaching System (JABS) and ABS Tactical Decision Aid testing is ongoing. Intelligence/Surveillance/Reconnaissance/ Targeting (ISR/T) - COBRA Block I achieved IOC in July 2017. The COBRA program will continue to use Evolutionary Acquisition and introduce additional COBRA capabilities through the use of Incremental ("Block") Development. Three increments (or Blocks) of development have been planned in order to meet the mine line and minefield detection requirements. The contract for Block I was awarded to Arete in Tucson, AZ in FY 2021 and will complete in FY 2028.											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0604126N / Airborne Mine Countermeasures

Project (Number/Name)

2131 / Assault Breaching System

Product Development (\$ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Primary Hardware Dev, COBRA	C/CPAF	Arete : Tucson, AZ	19.554	0.000		0.000		0.000		-		0.000	0.000	19.554	-
Design and Development, COBRA Block I Upgrades	C/CPFF	Arete : Tucson, AZ	0.000	7.626	Sep 2022	0.000		0.000		-		0.000	0.000	7.626	-
Design and Development, COBRA Algorithm Development	Various	JHU/APL : Columbia, MD	0.000	2.160	May 2022	0.000		0.000		-		0.000	0.000	2.160	-
Systems Engineering, COBRA	WR	NSWC, PC : PANAMA CITY, FL	3.218	2.540	Nov 2021	1.038	Nov 2022	0.000		-		0.000	0.000	6.796	-
JABS	WR	NSWC PC : NSWC IH	1.153	0.000		0.940	Nov 2022	0.000		-		0.000	0.000	2.093	-
ABS IPT/Test Assets/Proj Eng	WR	NSWC, PC : PANAMA CITY, FL	0.634	0.126	Nov 2021	0.371	Nov 2022	0.000		-		0.000	0.000	1.131	-
Design and Development, COBRA Payload Integration	WR	NAVAIR : Patuxent River, MD	0.000	0.000	Dec 2021	9.314	May 2023	0.000		-		0.000	0.000	9.314	-
Design and Development, COBRA Payload Integration	C/CPFF	Arete, Northrop Grumman : AZ, CA	0.000	0.000		2.186	May 2023	0.000		-		0.000	0.000	2.186	-
Subtotal			24.559	12.452		13.849		0.000		-		0.000	0.000	50.860	N/A

Remarks

FY23 Product Development net decrease associated with Congressional Directed Reduction. FY23 Award Dates for COBRA Payload Integration moved to align with anticipated contract awards.

Support (\$ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Development Support	WR	NSWC, PC : PANAMA CITY, FL	3.396	1.256	Nov 2021	3.487	Nov 2022	0.000		-		0.000	0.000	8.139	-
Integrated Logistics Support	WR	NSWC PC : PANAMA CITY, FL	0.459	0.411	Nov 2021	0.783	Nov 2022	0.000		-		0.000	0.000	1.653	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604126N / Airborne Mine Countermeasures				Project (Number/Name) 2131 / Assault Breaching System					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Configuration Management	WR	NSWC, PC : PANAMA CITY, FL	0.461	0.360	Nov 2021	0.685	Nov 2022	0.000		-		0.000	0.000	1.506	-
Studies & Analysis	WR	NSWC IH : INDIAN HEAD, MD	0.968	0.371	Nov 2021	0.761	Nov 2022	0.000		-		0.000	0.000	2.100	-
Subtotal			5.284	2.398		5.716		0.000		-		0.000	0.000	13.398	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NSWC, IH : INDIAN HEAD, MD	4.527	0.151	Nov 2021	0.000		0.000		-		0.000	0.000	4.678	-
Developmental Test & Evaluation (DT&E)	WR	NSWC PC : Panama City, FL	1.984	0.196	Nov 2021	2.650	Dec 2022	0.000		-		0.000	0.000	4.830	-
Developmental Test & Evaluation (DT&E)	WR	NSWC, PC : Panama City, FL	2.239	0.000		0.000		0.000		-		0.000	0.000	2.239	-
Developmental Test & Evaluation (DT&E)	WR	NAVAIR : Pax River, MD	12.649	0.000		0.000		0.000		-		0.000	0.000	12.649	-
Developmental Test & Evaluation (DT&E)	WR	NAVAIR : Patuxent River, MD	0.000	0.000		5.025	Apr 2023	0.000		-		0.000	0.000	5.025	-
Subtotal			21.399	0.347		7.675		0.000		-		0.000	0.000	29.421	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	C/CPFF	BAH, Northrop Grumman : DC, FL	0.498	0.353	Dec 2021	0.562	Dec 2022	0.000		-		0.000	0.000	1.413	-
Government Engineering Support	WR	NSWC, IH : INDIAN HEAD, MD	1.860	1.075	Nov 2021	1.085	Nov 2022	0.000		-		0.000	0.000	4.020	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023					
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604126N / Airborne Mine Countermeasures						Project (Number/Name) 2131 / Assault Breaching System					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total					
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract		
Program Management Support	WR	NSWC/ IH, PC : INDIAN HEAD, PANAMA CITY	1.657	1.312	Oct 2021	1.201	Oct 2022	0.000		-		0.000	0.000	4.170	-		
Travel	WR	NAVSEA : WNY, DC	0.208	0.130	Nov 2021	0.152	Nov 2022	0.000		-		0.000	0.000	0.490	-		
Subtotal			4.223	2.870		3.000		0.000		-		0.000	0.000	10.093	N/A		
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals			55.465	18.067		30.240		0.000		-		0.000	0.000	103.772	N/A		
Remarks																	

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

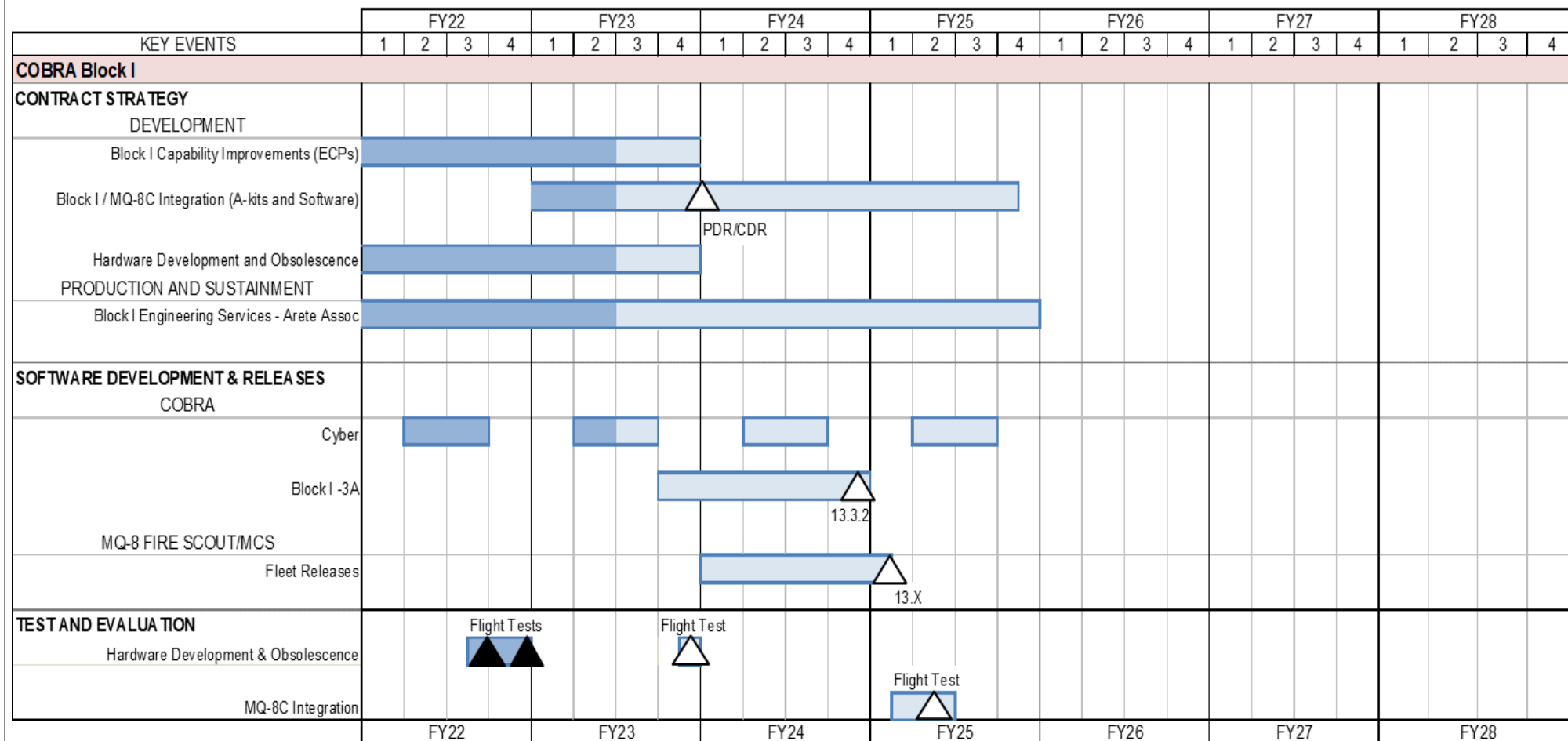
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R-1 Program Element (Number/Name)

PE 0604126N / Airborne Mine Countermeasures

Project (Number/Name)

2131 / Assault Breaching System



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PE 0604126N: *Airborne Mine Countermeasures*
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PE 0604126N / Airborne Mine Countermeasures

2131 / Assault Breaching System

	FY22				FY23				FY24				FY25				FY26				FY27				FY28			
KEY EVENTS	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
COBRA Block II																												
REQUIREMENTS			CDD Approval ▲																									
ACQUISITION MILESTONES			Program Terminated ▲																									
CONTRACT STRATEGY			AS/AP ▲																									
SYSTEM DEVELOPMENT Engineering & Manufacturing Development			 Gov't Sys Eng & Design Review																									
TEST AND EVALUA TION																												
	FY22				FY23				FY24				FY25				FY26				FY27				FY28			

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0604126N / Airborne Mine Countermeasures

Project (Number/Name)

2131 / Assault Breaching System

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
COBRA BLOCK I				
Development: Capability Improvements (ECPs)	1	2022	4	2023
Development: COBRA Block I / MQ-8C Integration	1	2023	4	2025
Development: COBRA Block I / MQ-8C Integration PDR/CDR	1	2024	1	2024
Development: Hardware Development & Obsolescence	1	2022	4	2023
Production & Sustainment: Block I Engineering, Production, and Sustainment	1	2022	4	2025
Software Development & Releases: COBRA Block I: Cyber	2	2022	3	2022
Software Development & Releases: COBRA Block I: Cyber 2	2	2023	3	2023
Software Development & Releases: COBRA Block I: Cyber 3	2	2024	3	2024
Software Development & Releases: COBRA Block I: Cyber 4	2	2024	3	2024
Software Development & Releases: COBRA Block I: 13.3.2	4	2023	4	2024
Software Development & Releases: MQ-8 Fire Scout/MCS: 13.0 Fleet Releases	1	2024	1	2025
Test & Evaluation: Hardware Development & Obsolescence Flight Tests (Multiple)	3	2022	4	2023
Test & Evaluation: MQ-8C Integration Flight Test	1	2025	2	2025
COBRA BLOCK II				
Requirements: CDD Approval	3	2022	3	2022
Acquisition Milestones: Program Terminated	3	2022	3	2022
Contract Strategy: AS/AP	3	2022	3	2022
System Development: Systems Engineering & Design Review	2	2022	3	2022

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>					R-1 Program Element (Number/Name) PE 0604127N / <i>Surface Mine Countermeasures</i>							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	57.557	11.924	12.959	16.127	-	16.127	15.442	13.630	13.760	14.036	Continuing	Continuing
0530: <i>Mine Hunt Systems</i>	31.456	4.741	2.121	5.673	-	5.673	5.181	4.381	4.400	4.489	Continuing	Continuing
1235: <i>Mine Warfare Planning and Analysis</i>	26.101	7.183	10.838	10.454	-	10.454	10.261	9.249	9.360	9.547	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Surface Mine Countermeasures (SMCM) Program Element (PE) provides resources in support of development of mine countermeasures systems to provide minehunting and neutralization to counter known and projected mine threats. The mine countermeasures systems provide mobile, quick reaction forces capable of land or sea-based minehunting and neutralizing operations worldwide. Resources are for developing and deploying advanced minehunting and neutralization systems and the intelligence and oceanographic capabilities that will enable mine warfare superiority. Tactics and techniques used vary across a diversity of environments and a diversity of threats, including both asymmetric and emerging. Resources provide for systems and support of mine warfare systems, maritime systems, and expeditionary systems to allow for continuous operations of the Navy's warships and support vessels, other military vessels, and commercial vessels. Increased capability includes conducting minefield reconnaissance (mine density and location) at high area search rates; improving detection capability; decreasing sensor false alarm rates; reducing or eliminating post-mission analysis detect, classify, identify, decide time; improving neutralization time; improving network communications; automatic target recognition; and achieving in-stride detect-to-engage capability. The Surface Mine Countermeasures programs are in general platform independent and will provide detection, classification, localization, identification, neutralization, and influence clearance capabilities. Programs develop: (1) Unmanned minehunting capability for surface platforms; (2) the integration and improvement of new and existing systems (3) support for systems which detect, localize, classify, identify, and neutralize all mine types across MCM Avenger Class, Littoral Combat Ship (LCS) Class and other platforms.

1) The AN/AQS-20 is a minehunting and identification system with sensors housed in an underwater towed body. The sensors are designed for the detection, classification and localization of bottom, close-tethered, and volume targets, and for the identification of bottom targets. The system can be deployed from the Littoral Combat Ship (LCS) as part of the MCM Mission Package or can be deployed from other Vessels of Opportunity (VOO). The MCM USV is the tow platform for the AN/AQS-20.

2) AN/SQQ-32(V)4 High-Frequency, Wide Band (HFWB) is a technology upgrade to the AN/SQQ-32 Towed Body which incorporated HFWB technology into the detection sonar to address performance deficiencies against new mine threats in the littorals. This upgrade was installed on MCM-1 Class ships.

3) AN/SLQ-60 Mine Neutralization System (MNS) Seafox on the MCM Class ships. MNS is the replacement to the existing AN/SLQ-48 Mine Neutralization System.

4) Mine Warfare and Environmental Decision Aids Library (MEDAL) is the U.S. Navy's single Mine Warfare (MIW) tactical decision support system for integrated mission planning, evaluation, and situational awareness. MEDAL provides mine warfare planning and evaluation tools and databases to mine countermeasures (MCM) Commanders and is employed at the unit level to perform MCM sortie planning and evaluation. The current MEDAL increment, known as MEDAL Enterprise

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0604127N I Surface Mine Countermeasures				
Architecture (EA), is no longer dependent on Global Command and Control System - Maritime (GCCS-M) for fielding to MIW fleet users. MEDAL EA is a family of systems, comprised of the following three components: MINEnet Global, MINEnet Tactical, and Minefield Planning. MINEnet Global is a shore-based website that provides MIW waterspace awareness functionality to support Navy non-MIW forces. MINEnet Global provides downloadable reference databases, MIW reference publications and links to MIW information. The MINEnet Tactical component is a software application which provides MCM tactical planning, situational awareness and post mission evaluation capabilities. It is fielded to standard Navy networks including, Consolidated Afloat Networks and Enterprise Services (CANES), Integrated Shipboard Network System (ISNS), and Navy Marine Corps Intranet (NMCI) servers and uses common web browsers as the user interface. Minefield Planning is also a tactical software application which provides the capability to plan mining operations.						
5) MIW Integrated Synthetic Trainer (MIST) will provide integrated phase training for MIW staffs in end-to-end MCM scenarios. This tool will provide the capability to train MIW staffs against near peer threats.						
B. Program Change Summary (\$ in Millions)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget		12.507	12.959	16.069	-	16.069
Current President's Budget		11.924	12.959	16.127	-	16.127
Total Adjustments		-0.583	0.000	0.058	-	0.058
• Congressional General Reductions		-	-			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	-			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-0.180	0.000			
• SBIR/STTR Transfer		-0.404	0.000			
• Rate/Misc Adjustments		0.001	0.000	0.058	-	0.058
Change Summary Explanation						
FY 2022 reflects a net decrease of \$583K for reprogramming and SBIR assessments.						
FY 2023 no adjustments.						
FY 2024 \$58K misc. rate adjustments						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604127N / Surface Mine Countermeasures				Project (Number/Name) 0530 / Mine Hunt Systems			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0530: Mine Hunt Systems	31.456	4.741	2.121	5.673	-	5.673	5.181	4.381	4.400	4.489	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Mine Hunt Systems project contains resources for systems, subsystems, and sensors integrated for use with the Mine Countermeasures Unmanned Surface Vehicle (MCM USV) for mine detection, classification, localization, identification, and neutralization capabilities. Research, development, test, and evaluation efforts are for increasing capability by decreasing time required to conduct Mine Countermeasures (MCM) operations, ensuring low risk to naval and commercial vessels, and removing the man from the minefield. Increased capability includes conducting minefield reconnaissance (mine density and location) at high area search rates, improving detection capability, decreasing sensor false alarm rates, and reducing post-mission analysis time for detection, classification, and identification.

The AN/AQS-20C is a mine hunting and identification system with sensors housed in an underwater towed body. The AN/AQS-20C integrates the Wideband Forward Looking Sonar (WBFLS), multifunction Synthetic Aperture Sonar (SAS), and Digital Gap Fill Sonar (DGFS) for the detection, classification and localization of bottom, close- tethered, volume targets. Integration of the Electro-Optic Identification (EOID) sensor enables identification of bottom targets. The system can be deployed from the Littoral Combat Ship (LCS) as part of the MCM Mission Package (MP) or can be deployed from other Vessels of Opportunity (VOO). The MCM USV is the tow platform for the AN/ AQS-20C. Materiel reliability, obsolescence, and performance Engineering Change Proposal (ECP) efforts continue beyond FY 2027. In FY 2022, the AN/AQS-20 Program completed DT/OT with MCM USV, and supported the MCM Mission Package (MP) IOT&E. Completion of DT/OT with the MCM USV satisfies AN/AQS-20 IOT&E requirements.

In FY 2024, the AN/AQS-20 program will continue development of Automated Target Recognition (ATR) efforts, Acoustic ID, ensure compliance with cybersecurity requirements, and resolve system obsolescence. Based on MCM MP IOT&E and MCM USV DT/OT, corrective action updates will be integrated and ECPs incorporated in to the system. Offshore integration and test will verify product development efforts, and design upgrades due to obsolescence.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: AN/AQS-20 Product Development	2.137	1.161	3.349	0.000	3.349
Articles:	-	-	-	-	-
FY 2023 Plans: - Continue development of user tools and training curriculum to improve iPMA performance - Development Integration of ATR capability into the iPMA and user interface to improve Sailor performance - Develop test plan and tactics for implementation of in-stride high resolution image supporting identification requirement on AN/AQS-20 - Continue development of super classification of mines by leveraging machine learning					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023				
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604127N / Surface Mine Countermeasures	Project (Number/Name) 0530 / Mine Hunt Systems				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div>- Improve ATR by leveraging machine learning through algorithm development and multi sensor data fusion to increase probability of detection and reduced false cells.</div> <div>- Develop ECPs to resolve findings from MCM USV TECHEVAL & IOT&E and MCM MP TECHEVAL & IOT&E for LCS Independence Variant</div> <div>FY 2024 Base Plans:<div>- Continued Improvement of ATR through algorithm refinement for new environments and targets to reduce false calls. ATR integration with MCM USV system verification and test</div><div>- Improve iPMA sailor experience by reducing workload, complexity and performance through use of automation</div><div>- Complete ECPs to resolve findings from MCM USV TECHEVAL & IOT&E and MCM MP TECHEVAL & IOT&E for LCS Independence Variant</div></div> <div>FY 2024 OCO Plans:<div>N/A</div></div> <div>FY 2023 to FY 2024 Increase/Decrease Statement:<div>Increase in FY2024 funds iPMA ATR and reduction in workload improvements.</div></div>							
<div>Title: AN/AQS-20 Support</div> <div>Articles:</div>			0.800	0.484	1.780	0.000	1.780
<div>FY 2023 Plans:<div>- Provide ongoing technical and management support to AN/AQS-20 product development</div><div>- Provide engineer support to meet cyber security RMF process</div><div>- Provide engineer support for FRP units modification and design upgrades due to obsolescence</div><div>- Continue assess, score, and update AN/AQS-20 Block 2 tactics based on Mission Planning and Post Mission Analysis performance improvement from ATR and iPMA improvements</div></div> <div>FY 2024 Base Plans:<div>- Provide ongoing technical and management support to AN/AQS-20 product development</div><div>- Provide engineer support, design and upgrade for obsolescence of aging components and software within the Q-20C</div><div>- Update AN/AQS-20 Block 2 and A to C tactics based on new capability provided from ATR, Acoustic ID and Post Mission Analysis performance improvements</div></div> <div>FY 2024 OCO Plans:</div>			-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604127N / Surface Mine Countermeasures	Project (Number/Name) 0530 / Mine Hunt Systems				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: Increase in FY2024 support updates to AQS-20 Block 2 A to C tactics.						
Title: AN/AQS-20 Test and Evaluation Articles:		1.612 -	0.340 -	0.000 -	0.000 -	0.000 -
FY 2023 Plans: -Conduct test planning for off shore integration and test to verify product development efforts, and design upgrades due to obsolescence FY 2024 Base Plans: N/A FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: All testing will be completed in FY2023.						
Title: AN/AQS-20 Management Services Articles:		0.192 -	0.136 -	0.544 -	0.000 -	0.544 -
FY 2023 Plans: - Provide planning and management for the AN/AQS-20 program - Continue to provide Program Office travel support FY 2024 Base Plans: - Provide planning and management for the AN/AQS-20 program - Continue to provide Program Office travel support FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: The increase in FY2024 support the increased program efforts from FY2023.						
Accomplishments/Planned Programs Subtotals		4.741	2.121	5.673	0.000	5.673

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604127N / <i>Surface Mine Countermeasures</i>	Project (Number/Name) 0530 / <i>Mine Hunt Systems</i>	

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPN/1601: <i>LCS</i> <i>MCM Mission Modules</i>	30.119	92.495	93.961	-	93.961	122.654	103.972	59.906	61.344	1,508.277	2,664.640

Remarks

OPN/1601 - The above funding line accounts for several programs, of which the Mine Hunt Systems program is only a portion.

D. Acquisition Strategy

AN/AQS-20 Low-Rate Initial Production (LRIP) procurement continued following the Block 2 (AQS-20C units) competitive contract award in FY 2014. In FY 2020, the AN/AQS-20 program leveraged the Unmanned Surface Vehicle (USV) Family of Systems (FoS) Indefinite Delivery Indefinite Quantity (IDIQ) Multiple Award Contract (MAC) to award multiple risk reduction efforts. The risk reduction efforts helped increase competition for FY 2025 sonar production. The risk reduction effort transitioned volume sonar capability and familiarized industry to specific sonar requirement based on the finding from FY 2019 market research. In FY 2021, a sole-source AN/AQS-20A (Block 1) to AN/AQS-20C (Block 2) upgrade contract was awarded to Raytheon to continue delivering sonars to support integration and testing for the LCS MCM MP. Risk reduction effort will inform the update of acquisition documentation in 2023 in order to define the next generation Minehunt Towed Sonar and ensure future competition. In the FY 2024 Request for Proposal will initiate competition for the FY 2025 sonar production contract.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604127N / Surface Mine Countermeasures				Project (Number/Name) 0530 / Mine Hunt Systems					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/AQS-20 Block 2 MCM USV Integration	C/CPFF	Raytheon : Portsmouth, RI	0.300	0.737	Nov 2021	0.000		0.623	Dec 2023	-		0.623	0.000	1.660	-
AN/AQS-20 Block 2	C/CPFF	Raytheon : Portsmouth, RI	4.959	0.315	Nov 2021	0.531	Nov 2022	0.840	Dec 2023	-		0.840	Continuing	Continuing	Continuing
AN/AQS-20 Block 2	C/CPFF	ARL/UT : Austin, TX	1.350	0.485	Nov 2021	0.100	Nov 2022	0.363	Dec 2023	-		0.363	Continuing	Continuing	Continuing
AN/AQS-20 Block 2 PMA	WR	NSWC, PC : Panama City, FL	2.100	0.250	Oct 2021	0.300	Oct 2022	0.311	Nov 2023	-		0.311	Continuing	Continuing	Continuing
AN/AQS-20 Block 2 PMA	C/CPFF	ARL/UT : Austin, TX	2.178	0.350	Dec 2021	0.230	Dec 2022	0.552	Dec 2023	-		0.552	Continuing	Continuing	Continuing
AN/AQS-20 Risk Reduction	C/FFP	Various : Various	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	-
AN/AQS-20 Block 2 ATR	C/CPFF	JHU-APL : Laurel, MD	0.000	0.000		0.000		0.297	Dec 2023	-		0.297	0.000	0.297	-
AN/AQS-20 Block 2 ATR	C/CPFF	NGC : Annapolis, MD	0.000	0.000		0.000		0.363	Dec 2023	-		0.363	0.000	0.363	-
Subtotal			11.387	2.137		1.161		3.349		-		3.349	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/AQS-20 Engineering Services	WR	NUWC/NPT : Newport, RI	0.365	0.000		0.000		0.000		-		0.000	0.000	0.365	-
AN/AQS-20 Engineering Services	WR	NSWC, PC : Panama City, FL	0.501	0.140	Oct 2021	0.140	Oct 2022	0.468	Nov 2023	-		0.468	Continuing	Continuing	Continuing
AN/AQS-20 Engineering Services	C/CPFF	Raytheon : Portsmouth, RI	0.751	0.200	Nov 2021	0.200	Nov 2022	0.823	Nov 2023	-		0.823	Continuing	Continuing	Continuing
AN/AQS-20 ILS Function	WR	NSWC, PC : Panama City, FL	1.636	0.460	Nov 2021	0.144	Nov 2022	0.489	Nov 2023	-		0.489	Continuing	Continuing	Continuing
Subtotal			3.253	0.800		0.484		1.780		-		1.780	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604127N / Surface Mine Countermeasures					Project (Number/Name) 0530 / Mine Hunt Systems				
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	COTF : Norfolk, VA	0.775	0.358	Nov 2021	0.038	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC, PC : Panama City, FL	12.058	0.759	Oct 2021	0.225	Oct 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	C/CPFF	Raytheon : Portsmouth, RI	2.020	0.495	Nov 2021	0.077	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			14.853	1.612		0.340		0.000		-		0.000	Continuing	Continuing	N/A
Remarks COTF - Commander Operational Test and Evaluation Force															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/AQS-20 Management Services	Various	Various : Various	1.842	0.172	Dec 2021	0.116	Dec 2022	0.155	Dec 2023	-		0.155	Continuing	Continuing	Continuing
AN/AQS-20 Travel	Various	Various : Various	0.121	0.020	Mar 2022	0.020	Mar 2023	0.389	Mar 2024	-		0.389	Continuing	Continuing	Continuing
Subtotal			1.963	0.192		0.136		0.544		-		0.544	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			31.456	4.741		2.121		5.673		-		5.673	Continuing	Continuing	N/A
Remarks															

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Project (Number/Name)	Start Date	End Date	Duration (Days)	Progress (%)	Status	Notes
101	2023-01-01	2023-01-15	14	100	Completed	Project 101 completed on time.
102	2023-01-15	2023-02-01	16	75	In Progress	Project 102 is 75% complete.
103	2023-02-01	2023-02-15	14	50	In Progress	Project 103 is 50% complete.
104	2023-02-15	2023-03-01	15	25	In Progress	Project 104 is 25% complete.
105	2023-03-01	2023-03-15	14	10	In Progress	Project 105 is 10% complete.
106	2023-03-15	2023-03-31	15	0	Not Started	Project 106 has not started yet.
107	2023-03-31	2023-04-15	15	0	Not Started	Project 107 has not started yet.
108	2023-04-15	2023-04-30	15	0	Not Started	Project 108 has not started yet.
109	2023-04-30	2023-05-15	15	0	Not Started	Project 109 has not started yet.
110	2023-05-15	2023-05-31	15	0	Not Started	Project 110 has not started yet.

PE 0604127N / Surface Mine Countermeasures

0530 / Mine Hunt Systems

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0604127N / Surface Mine Countermeasures

Project (Number/Name)

0530 / Mine Hunt Systems

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 0530				
AN/AQS-20 Program Milestones: Initial Operational Capability (IOC)	2	2023	2	2023
AN/AQS-20 Development Phase: AN/AQS-20 Block 2	1	2022	1	2025
AN/AQS-20 Development Phase: AN/AQS-20 Materiel Reliability, Obsolescence, and Performance ECP Development (Block 2)	1	2022	4	2028
AN/AQS-20 Development Phase: AN/AQS-20 Block 2 Automated Target Recognition (ATR)	1	2022	4	2024
AN/AQS-20 Development Phase: AN/AQS-20 Block 2 Acoustic Identification Test Planning	2	2023	4	2023
iPMA Development: iPMA/NSAM Integration and Test	1	2022	2	2023
iPMA Development: iPMA Tech Refresh Baseline	1	2022	4	2022
iPMA Development: iPMA Deployment Baseline	1	2023	1	2024
iPMA Development: Tech Refresh Rev 1	1	2024	4	2025
iPMA Development: Tech Refresh Rev 2	1	2026	4	2027
iPMA Development: Tech Refresh Rev 3	1	2028	4	2028
AN/AQS-20 Test and Evaluation: AN/AQS-20/MCM USV IOT&E	4	2022	4	2022
MCM Mission Package Testing: MCM MP IOT&E	4	2022	4	2022
AN/AQS-20 Production: AN/AQS20A - AQS20C Upgrades	1	2022	3	2024
AN/AQS-20 Production: AQS-20C Production	2	2025	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604127N / Surface Mine Countermeasures				Project (Number/Name) 1235 / Mine Warfare Planning and Analysis			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
1235: Mine Warfare Planning and Analysis	26.101	7.183	10.838	10.454	-	10.454	10.261	9.249	9.360	9.547	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Mine Warfare Planning and Analysis project consists of two projects, the Mine Warfare and Environmental Decision Aids Library (MEDAL) and the Mine Warfare Integrated Synthetic Trainer (MIST). MEDAL is the U.S. Navy's single MIW tactical decision support system for integrated mission planning, evaluation, and situational awareness. MEDAL provides mine warfare planning and evaluation tools and databases to mine countermeasures (MCM) Commanders and is employed at the unit level to perform MCM sortie planning and evaluation. The most recent MEDAL increment, known as MEDAL Enterprise Architecture (EA), is no longer dependent on Global Command and Control System - Maritime (GCCS-M) for fielding to MIW fleet users. MEDAL EA is a family of systems, comprised of the following three components: MINEnet Global, MINEnet Tactical, and Minefield Planning. MINEnet Global is a shore-based website that provides MIW waterspace awareness functionality to support Navy non-MIW forces. MINEnet Global provides downloadable reference databases, MIW reference publications and links to MIW information. The MINEnet Tactical component is a software application which provides MCM tactical planning, situational awareness and post mission evaluation capabilities. It is fielded to standard Navy networks including, Consolidated Afloat Networks and Enterprise Services (CANES), Integrated Shipboard Network System (ISNS), and Navy Marine Corps Intranet (NMCI) servers and uses common web browsers as the user interface. Minefield Planning is also a tactical software application which provides the capability to plan mining operations. MIST will be a synthetic trainer which will provide training via end-to-end MCM scenarios for MIW staffs. This tool will provide the capability to train MIW staffs against near peer threats.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Product Development	3.599	6.173	6.108	0.000	6.108
Articles:	-	-	-	-	-
FY 2023 Plans: MEDAL: - Conduct Compact Encapsulated Effector (C-ENCAP) FNC with ONR. C-ENCAP will provide advanced minefield planning tools for subsequent integration into MEDAL's Minefield Planning software. - Begin Minefield Planning (MFP) v1.2 software development, which will begin meeting draft Information System-Capability Development Document requirements and begin integrating Compact Encapsulated Effector (C-ENCAP) tools. - Continue MINEnet Tactical (MNT) Modernization software build; versioning updated from MNT v1.4 to MNT v2.0 to align versioning scheme with the planned architecture update. Deliver prototype to Fleet for evaluation as part as Agile software development process.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604127N / Surface Mine Countermeasures		Project (Number/Name) 1235 / Mine Warfare Planning and Analysis		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Develop MINEnet Tactical (MNT) v1.3.4, implementing capabilities in accordance with backlog and user feedback; v1.3.4 will add capability to automate Allied Procedural Publication (APP-11) task message preparation.</p> <p>- Conduct annual tactical performance database (TPDB) update to add or refine weapons systems' performance values.</p> <p>MIST:</p> <p>- Complete v0.3 development for scenario generation.</p> <p>- Begin v1.0 end to end integration.</p> <p>FY 2024 Base Plans:</p> <p>MEDAL:</p> <p>- Complete Minefield Planning (MFP) v1.2 software development, integrating Compact Encapsulated Effector (C-ENCAP) tools and aligning with draft Information System-Capability Development Document as applicable.</p> <p>- Continue MINEnet Tactical (MNT) Modernization software build; versioning updated from MNT v1.4 to MNT v2.0 to align versioning scheme with the planned architecture update. Deliver prototype to Fleet for evaluation as part as Agile software development process.</p> <p>- Begin MINEnet Tactical (MNT) v1.3.5 implementing capabilities in accordance with backlog and user feedback.</p> <p>- Conduct annual tactical performance database (TPDB) update to add or refine weapons systems' performance values.</p> <p>MIST:</p> <p>- Complete v1.0 - end to end integration.</p> <p>- Begin v1.1 - incorporation of user feedback.</p> <p>FY 2024 OCO Plans:</p> <p>N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p> <p>No significant scope changes from FY2023 to FY2024.</p>						
Title: Engineering Support		2.651	3.721	3.229	0.000	3.229
Articles:		-	-	-	-	-
FY 2023 Plans:						
MEDAL:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604127N / Surface Mine Countermeasures		Project (Number/Name) 1235 / Mine Warfare Planning and Analysis		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div>- Re-evaluate systems engineering analyses to ensure MINEnet Tactical (MNT) v2.0 system architecture will meet requirements.</div> <div>- Adjudicate test observation reports (TORs) from MINEnet Tactical (MNT) v1.3.4 and MNT 2.0 annual prototype and document them as software backlog items.</div> <div>- Conduct systems engineering analysis for Minefield Planning (MFP) v1.2 - integration of Compact Encapsulated Effector (C-ENCAP) tools and Information Systems Capability Development Document (IS-CDD) alignment.</div> <div>- Conduct annual review of Navy training system plan, job-duty task analysis, front-end analysis, and Training Effectiveness Evaluation.</div> <div>- Develop engineering change proposals to maintain hardware and software baselines.</div> <div>- Develop training materials for MINEnet Tactical (MNT) v1.3.4.</div> <div>- Continue providing MEDAL engineering support to LCS MCM Mission Package following their TECHEVAL and IOT&E.</div> <div>MIST:</div> <div>- Continue assessing cybersecurity requirements and following process to obtain an authority to operate.</div> <div>- Conduct requirements analysis for MIST V1.0 - fully integrated build ready for release. Continue training curriculum development.</div> <div>- Conduct v0.3 release review.</div> <div>FY 2024 Base Plans:</div> <div>MEDAL:</div> <div>- Continue systems engineering analysis to ensure MINEnet Tactical (MNT) v2.0 system architecture will meet requirements.</div> <div>- Conduct systems engineering analysis for MFP v1.2 - integration of Compact Encapsulated Effector (C-ENCAP) tools and Information Systems Capability Development Document (IS-CDD) alignment.</div> <div>-Conduct requirements analysis for MINEnet Tactical (MNT) v1.3.5.</div> <div>- Adjudicate test observation reports (TORs) from MINEnet Tactical (MNT) 2.0 annual prototype and document them as software backlog items.</div> <div>- Conduct annual review of Navy training system plan, job-duty task analysis, front-end analysis, and training effectiveness evaluation.</div> <div>- Develop engineering change proposals to maintain hardware and software baselines.</div>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604127N / Surface Mine Countermeasures		Project (Number/Name) 1235 / Mine Warfare Planning and Analysis		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
MIST: - Continue assessing cybersecurity requirements and following process to obtain an authority to operate. - Conduct requirements analysis for MIST v1.1. - Complete training curriculum development. - Conduct v1.0 release review. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: No significant scope changes from FY2023 to FY2024.						
Title: Test and Evaluation <div>Articles:</div>		0.306 -	0.365 -	0.465 -	0.000 -	0.465 -
FY 2023 Plans: MEDAL: - Update MEDAL Test and Evaluation Master Plan to address comments and feedback from stakeholders in preparation for Milestone B. - Conduct MINEnet Tactical (MNT) v1.3.4 test. - Evaluate MINEnet Tactical (MNT) v2.0 prototype. MIST: - Conduct v0.3 prototype assessment. FY 2024 Base Plans: MEDAL: - Evaluate MINEnet Tactical (MNT) v2.0 prototype. MIST: - Begin MIST v1.0 developmental testing program. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604127N / Surface Mine Countermeasures		Project (Number/Name) 1235 / Mine Warfare Planning and Analysis	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
FY2023 to FY2024 decrease associated with completion of MINEnet Tactical (MNT) v1.3.4 testing in FY2023.					
Title: Management Services <div>FY 2023 Plans: MEDAL: - Continue to plan, track, follow-up and report on cost, schedule, and performance status. - Conduct oversight of project technical processes. - Develop cross-functional plans to meet draft Information Systems Capability Development Document (IS-CDD) requirements. MIST: - Continue to plan, track, follow-up and report on cost, schedule, and performance status. FY 2024 Base Plans: MEDAL: - Continue to plan, track, follow-up and report on cost, schedule, and performance status. - Conduct oversight of project technical processes. - Conduct Milestone B and address actions following the Milestone B review. MIST: - Continue to plan, track, follow-up and report on cost, schedule, and performance status. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: No significant scope changes from FY2023 to FY2024.</div>	0.627	0.579	0.652	0.000	0.652
	Articles: -	-	-	-	-
Accomplishments/Planned Programs Subtotals					
	7.183	10.838	10.454	0.000	10.454
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604127N / Surface Mine Countermeasures	Project (Number/Name) 1235 / Mine Warfare Planning and Analysis

D. Acquisition Strategy

The MEDAL program is government led and executed. NSWC PCD is the lead government activity, and awarded a Seaport engineering services contract to Innovative Professional Solutions (IPS) in FY 2020 to provide additional engineering capacity across disciplines.

MIST is a government product designed, developed and supported at NSWC PCD.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604127N / Surface Mine Countermeasures				Project (Number/Name) 1235 / Mine Warfare Planning and Analysis					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MEDAL EA	C/IDDQ	IPS : Panama City, FL	0.316	0.664	Jun 2022	0.145	Jun 2023	0.681	Jun 2024	-		0.681	Continuing	Continuing	Continuing
MEDAL EA & MIW Integrated Synthetic Training (MIST)	WR	NSWC PCD : Panama City FL	8.972	2.935	Oct 2021	4.214	Oct 2022	5.427	Oct 2023	-		5.427	Continuing	Continuing	Continuing
MEDAL EA & MIW Integrated Synthetic Training (MIST)	WR	Office of Naval Research : Various	0.000	0.000		1.814	Oct 2022	0.000	Oct 2023	-		0.000	0.000	1.814	1.814
Subtotal			9.288	3.599		6.173		6.108		-		6.108	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MEDAL EA & MIW Integrated Synthetic Training (MIST)	WR	NSWC PC : Panama City FL	11.694	2.528	Oct 2021	3.026	Oct 2022	2.950	Oct 2023	-		2.950	Continuing	Continuing	Continuing
MEDAL EA	C/IDDQ	IPS : Panama City FL	1.097	0.123	Jun 2022	0.695	Jun 2023	0.279	Jun 2024	-		0.279	Continuing	Continuing	Continuing
Subtotal			12.791	2.651		3.721		3.229		-		3.229	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NSWC PCD : Panama City, FL	1.345	0.158	Oct 2021	0.331	Oct 2022	0.432	Oct 2023	-		0.432	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	C/IDDQ	IPS : Panama City, FL	0.526	0.148	Jun 2022	0.034	Jun 2023	0.033	Jun 2024	-		0.033	Continuing	Continuing	Continuing
Subtotal			1.871	0.306		0.365		0.465		-		0.465	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity						R-1 Program Element (Number/Name)				Project (Number/Name)					
1319 / 4						PE 0604127N / Surface Mine Countermeasures				1235 / Mine Warfare Planning and Analysis					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MEDAL EA & MIW Integrated Synthetic Training (MIST)	WR	NSWC PC : Panama City FI	1.880	0.627	Oct 2021	0.301	Oct 2022	0.516	Oct 2023	-		0.516	Continuing	Continuing	Continuing
MEDAL EA	C/IDDQ	IPS : Panama City, FL	0.271	0.000	Jun 2022	0.278	Jun 2023	0.136	Jun 2024	-		0.136	0.000	0.685	-
Subtotal			2.151	0.627		0.579		0.652		-		0.652	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			26.101	7.183		10.838		10.454		-		10.454	Continuing	Continuing	N/A
Remarks															

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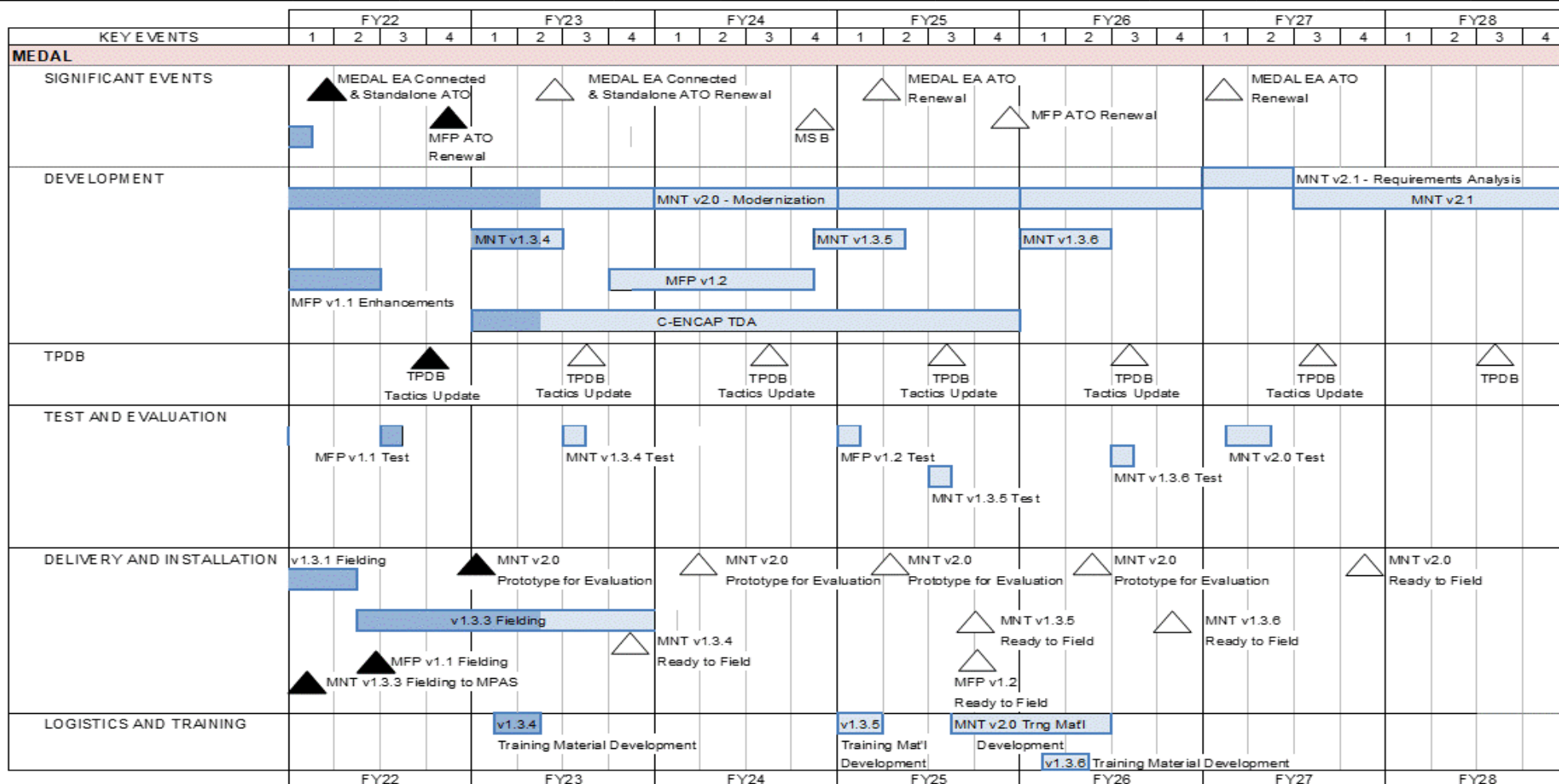
Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity
1319 / 4

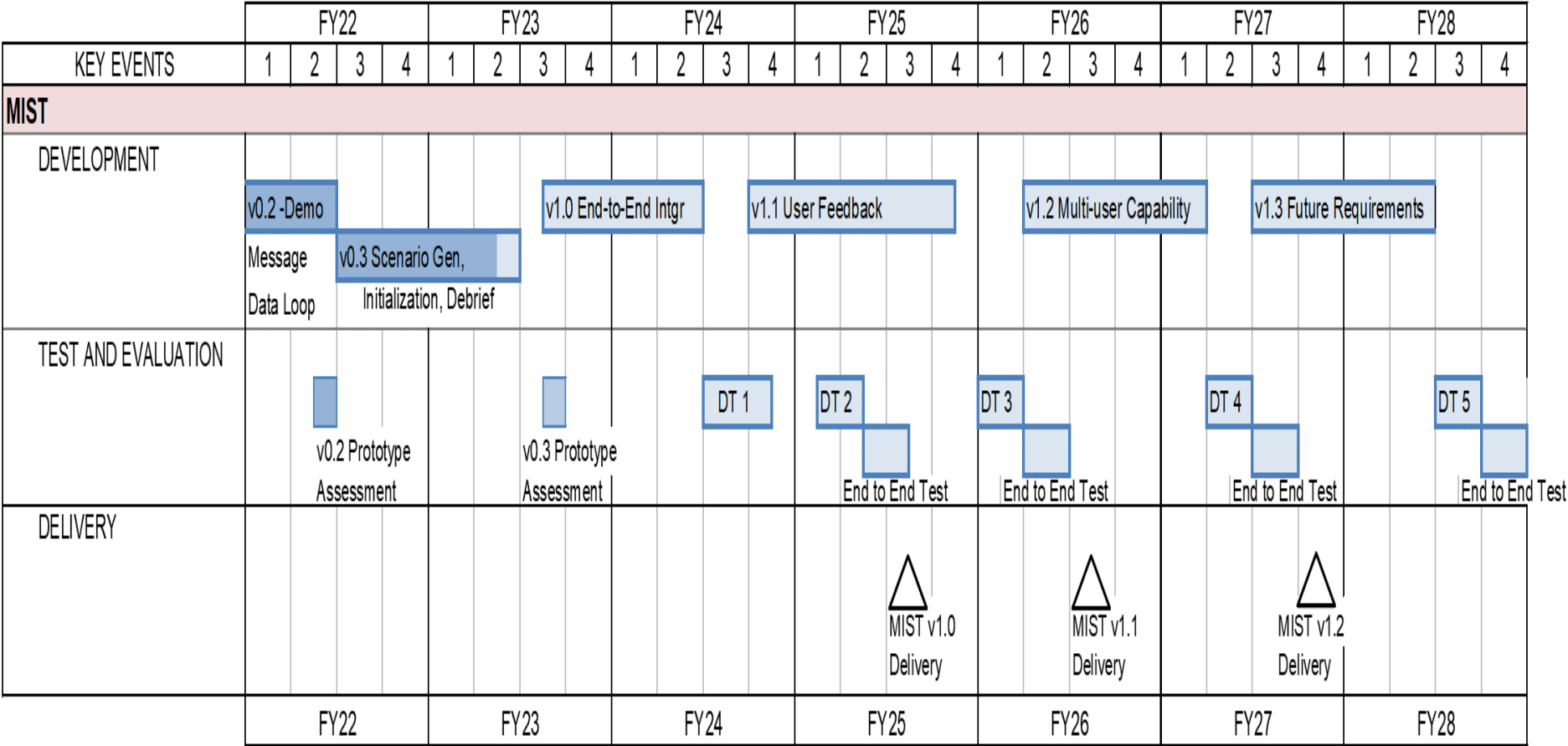
R-1 Program Element (Number/Name)
PE 0604127N / Surface Mine Countermeasures

Project (Number/Name)
1235 / Mine Warfare Planning and Analysis



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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																Date: March 2023			
Appropriation/Budget Activity 1319 / 4								R-1 Program Element (Number/Name) PE 0604127N / Surface Mine Countermeasures								Project (Number/Name) 1235 / Mine Warfare Planning and Analysis			



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0604127N / Surface Mine Countermeasures

Project (Number/Name)

1235 / Mine Warfare Planning and Analysis

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
MEDAL				
Significant Events: MEDAL EA Connected & Standalone ATO	1	2022	1	2022
Significant Events: Milestone B	4	2024	4	2024
Significant Events: MFP ATO Renewal	4	2022	4	2022
Significant Events: MEDAL EA Connected & Standalone ATO Renewal	2	2023	2	2023
Significant Events: MFP ATO Renewal 2	4	2025	4	2025
Significant Events: MFP ATO Renewal 3	4	2028	4	2028
Significant Events: MEDAL EA Connected & Standalone ATO Renewal 2	1	2025	1	2025
Significant Events: MEDAL EA Connected & Standalone ATO Renewal 3	1	2028	1	2028
System Development: MEDAL EA Development: MEDAL EA Development: MINEnet Tactical v2.0 Modernization	1	2022	4	2026
System Development: MEDAL EA Development: MEDAL EA Development: MINEnet Tactical v2.1 Requirements Analysis	1	2027	2	2027
System Development: MEDAL EA Development: MEDAL EA Development: MINEnet Tactical v2.1	3	2027	4	2028
System Development: MEDAL EA Development: MEDAL EA Development: MINEnet Tactical v1.3.4	1	2023	2	2023
System Development: MEDAL EA Development: MEDAL EA Development: MINEnet Tactical v1.3.5	4	2024	2	2025
System Development: MEDAL EA Development: MEDAL EA Development: MINEnet Tactical v1.3.6	1	2026	2	2026
System Development: MEDAL EA Development: MEDAL EA Development: Minefield Planning v1.1 (MFP) Enhancements	1	2022	2	2022

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604127N / Surface Mine Countermeasures		Project (Number/Name) 1235 / Mine Warfare Planning and Analysis	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
System Development: MEDAL EA Development: MEDAL EA Development: Minefield Planning v1.2 (MFP) Development		4	2023	4	2024
System Development: MEDAL EA Development: C-ENCAP TDA		1	2023	4	2025
Test and Evaluation: MEDAL EA T&E: MEDAL EA T&E: Minefield Planning v1.1 (MFP) Test		3	2022	3	2022
Test and Evaluation: MEDAL EA T&E: MEDAL EA T&E: MINEnet Tactical v1.3.4 (MNT) Test		3	2023	3	2023
Test and Evaluation: MEDAL EA T&E: MEDAL EA T&E: Minefield Planning v1.2 (MFP) Test		1	2025	1	2025
Test and Evaluation: MEDAL EA T&E: MEDAL EA T&E: MINEnet Tactical v1.3.5 (MNT) Test		3	2025	3	2025
Test and Evaluation: MEDAL EA T&E: MEDAL EA T&E: MINEnet Tactical v1.3.6 (MNT) Test		3	2026	3	2026
Test and Evaluation: MEDAL EA T&E: MEDAL EA T&E: MINEnet Tactical v2.0 (MNT) Test		1	2027	2	2027
Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINENet Tactical v1.3.1 Fielding		1	2022	2	2022
Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINENet Tactical v1.3.3 Fielding to MPAS		1	2022	1	2022
Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINENet Tactical v1.3.3 Fielding		2	2022	4	2022
Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MFP v1.1 Fielding		4	2022	1	2023
Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINENet Tactical v2.0 Prototype for Evaluation		1	2023	1	2023
Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINENet Tactical v2.0 Prototype for Evaluation 2		2	2024	2	2024
Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINENet Tactical v2.0 Prototype for Evaluation 3		2	2025	2	2025

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604127N / Surface Mine Countermeasures		Project (Number/Name) 1235 / Mine Warfare Planning and Analysis	
	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINENet Tactical v2.0 Prototype for Evaluation 4	2	2026	2	2026
Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINENet Tactical v2.0 Ready to Field	4	2027	4	2027
Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINENet Tactical v1.3.4 Ready to Field	4	2023	4	2023
Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINENet Tactical v1.3.5 Ready to Field	4	2025	4	2025
Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MFP v1.2 Ready to Fielding	4	2025	4	2025
Delivery Milestones: MEDAL EA Fielding: MEDAL EA Fielding: MINENet Tactical v1.3.6 Ready to Field	4	2026	4	2026
TBDP: Incremental TPDB Tactics Updates	1	2022	4	2028
LOGISTICS AND TRAINING: Training Material Development v1.3.4	1	2023	2	2023
LOGISTICS AND TRAINING: Training Material Development v1.3.5	1	2025	1	2025
LOGISTICS AND TRAINING: Training Material Development v1.3.6	1	2026	2	2026
LOGISTICS AND TRAINING: MINENet Tactical v2.0 Training Material Development	3	2025	2	2026
MIW Integrated Synthetic Training (MIST)				
System Development: MIST Development: Development v0.2	1	2022	2	2022
System Development: MIST Development: Development v0.3	3	2022	2	2023
System Development: MIST Development: Development v1.0	3	2023	2	2024
System Development: MIST Development: Development v1.1	4	2024	4	2025
System Development: MIST Development: Development v1.2	2	2026	1	2027
System Development: MIST Development: Development v1.3	3	2027	2	2028
Test & Evaluation: MIST T&E: v0.2 Fleet Prototype Assessment	2	2022	2	2022
Test & Evaluation: MIST T&E: v0.3 Fleet Prototype Assessment	3	2023	3	2023
Test & Evaluation: MIST T&E: v1.0 Developmental Test 1	3	2024	4	2024

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604127N / Surface Mine Countermeasures		Project (Number/Name) 1235 / Mine Warfare Planning and Analysis
		Start		End
Events by Sub Project		Quarter	Year	Quarter Year
Test & Evaluation: MIST T&E: v1.0 Developmental Test 2		1	2025	2 2025
Test & Evaluation: MIST T&E: v1.1 Developmental Test 3		1	2026	1 2026
Test & Evaluation: MIST T&E: v1.2 Developmental Test 4		2	2027	2 2027
Test & Evaluation: MIST T&E: v1.3 Developmental Test 5		3	2028	3 2028
Test & Evaluation: MIST T&E: v1.0 End to End Test 1		2	2025	3 2025
Test & Evaluation: MIST T&E: v1.1 End to End Test 2		2	2026	2 2026
Test & Evaluation: MIST T&E: v1.2 End to End Test 3		3	2027	3 2027
Test & Evaluation: MIST T&E: v1.3 End to End Test 4		4	2028	4 2028
Delivery Milestones: MIST Fielding: v1.0 Delivery		3	2025	3 2025
Delivery Milestones: MIST Fielding: v1.1 Delivery		3	2026	3 2026
Delivery Milestones: MIST Fielding: v1.2 Delivery		4	2027	4 2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>					R-1 Program Element (Number/Name) PE 0604272N I <i>Tact Air Dir Infrared CM (TADIRCM)</i>							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	196.948	32.530	39.028	34.684	-	34.684	22.146	15.422	14.569	15.169	Continuing	Continuing
3348: <i>DAIRCM Development</i>	196.948	32.530	15.028	34.684	-	34.684	22.146	15.422	14.569	15.169	Continuing	Continuing
9999: <i>Congressional Adds</i>	0.000	0.000	24.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	24.000

A. Mission Description and Budget Item Justification

This element includes development of electronic warfare systems for worldwide deployment of United States Navy (USN) and United States Marine Corps (USMC) assault aircraft. This includes the development and testing of advanced infrared (IR) countermeasures systems for aircraft survivability against emerging threats and for emergency contingencies. This program develops Hostile Fire Indication (HFI), and Laser Warning Sensors that integrates IR missile countermeasures with aircraft Countermeasures Dispensing Systems (CMDs) and expendables. DAIRCM adopts future multi-band, networking capabilities to facilitate real-time transfer of threat information, off-board queuing, and control of onboard sensors. DAIRCM studies and evaluates current and future aircraft threats, makes modeling and simulation for improved countermeasure capabilities, develops, tests and provides test equipment to address new and emerging threats for improved aircraft survivability of assault aircraft in complex terrain and EW environments.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	33.246	15.028	16.102	-	16.102
Current President's Budget	32.530	39.028	34.684	-	34.684
Total Adjustments	-0.716	24.000	18.582	-	18.582
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	24.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.716	0.000			
• Program Adjustments	0.000	0.000	18.732	-	18.732
• Rate/Misc Adjustments	0.000	0.000	-0.150	-	-0.150

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 9999: *Congressional Adds*

FY 2022	FY 2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023	
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0604272N / Tact Air Dir Infrared CM (TADIRCM)	
Congressional Add Details (\$ in Millions, and Includes General Reductions) Congressional Add: <i>Distributed aperture infrared countermeasures</i>		FY 2022	FY 2023
		0.000	24.000
Congressional Add Subtotals for Project: 9999		0.000	24.000
Congressional Add Totals for all Projects		0.000	24.000
Change Summary Explanation <p>The FY24 funding request increased by \$18.582M for continued design, development, integration and test of the AN/AAQ-45 Distributed Aperture Infrared Countermeasures (DAIRCM) system.</p> <p>Several factors contributed to a revised program schedule to include previous reprioritization decisions resulting in funding reductions across the FYDP and global supply chain issues impacting the prime contractor's ability to acquire hardware components to support system processor and sensor development, build and test. PB24 provides funding across the FYDP and coupled with the FY23 congressional add, executes a program strategy to introduce capability to the Fleet as quickly as possible. As a result of these factors, the following adjustments have occurred from PB23 to PB24.</p> <p>Acquisition Milestones: DAIRCM Test Readiness Review (TRR) IOT&E Gate was in Q2FY24 at PB23. Due to later than expected deliveries of EMD hardware, TRR has been separated into two events. TRR1 is in Q2FY23 and is expected to determine the system's ability to enter into Software in the Loop (SIL) testing and allows the buy down of technical risk earlier in the program than previously planned. TRR2 is in Q4FY23 and is expected to determine the system's ability to enter into developmental flight test. DAIRCM Milestone C moved from 3QFY24 to 4QFY25. Full Rate Production Decision (FRPD) moved from 1QFY26 to 2QFY27. Initial Operational Capability (IOC) moved from 4QFY26 to 3QFY28.</p> <p>Contract Milestones: The EMD contract award was extended by 13 months to allow for later than expected hardware deliveries. The Engineering Design Model (EDM) hardware deliveries moved from Q1FY23 to Q1FY24. EMD deliveries began on time but will take the entirety of FY23 to deliver vice the previously contracted completion of deliveries in Q1 of FY23. The Low-Rate Initial Production (LRIP) contract award moved from Q3FY24 to Q1FY26. The LRIP delivery schedule moved from Q4FY25-Q1FY27 to Q3FY26-Q3FY28. The Full-Rate Production (FRP) contract award moved from Q1FY26 to Q2FY27. The FRP delivery schedule moved from Q1FY27-Q4FY27 to Q3FY28-Q4FY28. The DRS BOA, IDIQ contract, and Production Representative Models (PRM) were added to the schedule.</p> <p>Test and Evaluation: DAIRCM Integrated Test (IT) moved from Q1FY24-Q2FY24 to Q1FY26-Q3FY26. Due to the later than expected deliveries of EMD hardware, the program has adopted a SIL heavy test program using surrogate hardware to buy down program technical risk in in FY23 while waiting for the delivery of actual EMD hardware. The program will execute a fly-fix-fly strategy during developmental flight test in FY24 and early FY25. This will maximize the number of deficiencies that can be discovered and corrected prior to the COTF Operational Assessment and MS-C Decision. Independent Logistics Assessment (ILA) moved from Q4FY23 to Q4FY24. Flight Test (FT) Q3FY23 has been removed and replaced with Developmental Test (DT) and is now in Q2FY4-Q1FY25. FY24 DAIRCM Live Fire (LF) has been removed and replaced with Live Fire Test and Evaluation (LFT&E) in Q1FY25-Q2FY25 and FY26 DAIRCM Live Fire (LF) has been changed to Live Fire Test and Evaluation (LFT&E) 3Q26-4Q26. Installation of PRM hardware on an Operational Test (OT) aircraft is the precursor to</p>			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604272N I Tact Air Dir Infrared CM (TADIRCM)	
<p>post-MSD IT, LFT&E and OT. DAIRCM Initial Operational Test and Evaluation (IOT&E) has been removed and replaced with OT on the schedule. SIL TEST has been added to the schedule. First Article (FA) has been removed from the schedule. SVR/FC/A/PRR moved from Q3FY24 to Q3FY25 and has been realigned from T&E to Production Milestones on the schedule.</p> <p>Software Builds: Pt. Mugu Software Development Builds and DRS Software Builds were added to the schedule. OT Installs/IOC Installs/FRP Installs, NRL SW Threat Pacing Development Builds, and DRS Pre Planned Product Improvements have been added to provide additional detail in FY26-28. JUONS Technical Insertion and installs were removed.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604272N / Tact Air Dir Infrared CM (TA DIRCM)				Project (Number/Name) 3348 / DAIRCM Development			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3348: DAIRCM Development	196.948	32.530	15.028	34.684	-	34.684	22.146	15.422	14.569	15.169	Continuing	Continuing
Quantity of RDT&E Articles		4	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The projects in this element advances the processor, laser, and sensor development of the AN/AAQ-45 Distributed Aperture Infrared Countermeasures (DAIRCM) system in order to outpace current / future threats in addition to adding growth for future capabilities. These modifications significantly increase aircraft survivability of Department of Navy (DoN) assault aircraft in complex terrain for worldwide deployment. The DAIRCM system consists of three major components: missile warning sensors, processor, and inexhaustible laser countermeasures. DAIRCM interfaces with the platform aircraft and provides signals to onboard Aircraft Survival Equipment (ASE). Within the Department of Navy, UH-1Y is the lead platform for the DAIRCM Program. The DAIRCM program advances lessons learned from the JUONs to incorporate the system under glass in the H-1; improves laser power; increases processor to allow for additional sensors to meet platform/mission needs; improves sensor countermeasure features; improves effectiveness for flare deployment; and further develops cyber security. The DAIRCM design is scalable to expedite expansion to other platforms and improve crew threat situational awareness. The program also advances modeling and simulation for new countermeasures, and develops necessary test equipment for program success.

FY24 RDT&E funding is required to continue development and test of the DAIRCM system. The program will continue development of Government tracking software and testing of under glass solutions. DAIRCM will continue studies and evaluations of current and future aircraft threats, modeling and simulation for improved countermeasure capabilities, development, testing, and test equipment to address new and emerging threats. The program will conduct lead platform (UH-1Y) ground and flight test for DAIRCM integration of both A-Kit and B-Kit as well as correct deficiencies found during test.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: DAIRCM Development	32.530	15.028	34.684	0.000	34.684
Articles:	4	-	-	-	-
FY 2023 Plans: Complete Software drop one (SW1) acceptance qualification. Complete Platform A-kit integration. Begin SIL testing. Complete TRR (1) and TRR (2).					
FY 2024 Base Plans: Complete delivery of four (4) EDM and Mass Models. Complete Software drops two (2), three (SW3), and four (SW4) acceptance and qualification testing. Complete DT install and begin Developmental Test (DT) on aircraft. Complete Independent Logistic Assessment (ILA).					
FY 2024 OCO Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0604272N / Tact Air Dir Infrared CM (TA DIRCM)				Project (Number/Name) 3348 / DAIRCM Development				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A												
FY 2023 to FY 2024 Increase/Decrease Statement: Increase in budget from FY2023 to FY2024 of \$19.656M required to complete delivery of EDM control processors, EDM Lasers, EDM Sensors, and EDM Fiber optic Cable Assemblies. Additionally, continued OFP software development, including development and incorporation of advanced missile tracking algorithms and Hostile Fire indication algorithms and system security. Procure Production Representative Models to support FOT&E.												
Accomplishments/Planned Programs Subtotals								32.530	15.028	34.684	0.000	34.684
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
• APN/0576: Distributed Aperture Infrared Countermeasures (DAIRCM)	2.006	32.311	1.500	-	1.500	14.584	22.931	21.559	34.042	203.838	415.287	
• APN/0605: (9504) Common ECM Mod Spares (OCO)	6.867	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.867	
Remarks												
APN/0576 represents one (1) OSIP (OSIP 018-17 Distributed Aperture Infrared Countermeasures (DAIRCM)) from the Common ECM Equipment budget. APN/0605 represents only a portion of the total Common ECM Mod Spares budget.												
D. Acquisition Strategy												
The Distributed Aperture Infrared Countermeasures (DAIRCM) ACAT II Program is a scalable acquisition approach that provides the architecture for an integrated aircraft survivability system with preplanned product improvements (P3I) to outpace the threats into the future. It replaces the existing AN/AAR-47 UV Threat Warning System - providing an inexhaustible countermeasure with improved 2-color IR Threat Warning system and growth capability to meet future design improvements and combat advanced threats. It leverages JUONs capability, cooperation between Government laboratories and industry partners to grow into an integrated capability that meets the key performance parameters. The DAIRCM program awarded a development cost contract in FY20. The DAIRCM program will also award contract modifications for new platforms to procure DAIRCM Engineering Development Models (EDMs), Production Representative Models (PRMs) and nonrecurring engineering development and test support as future material solution for their platforms. The addition of other Services platforms is expected to lower the overall acquisition costs for all services. A separate production contract will be awarded for Milestone C planned for 4Q2025 for services that selected DAIRCM as future material solution for their platforms.												

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604272N / Tact Air Dir Infrared CM (TA DIRCM)				Project (Number/Name) 3348 / DAIRCM Development					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
H-1 Operational Flight Program Dev	C/CPFF	Northrop Grumman : Woodland Hills, CA	4.510	1.415	Jun 2022	0.300	Jun 2023	0.150	Jun 2024	-		0.150	Continuing	Continuing	Continuing
Govt Eng Support	WR	NAWCAD : Patuxent River, MD	4.880	2.651	Oct 2021	2.408	Oct 2022	2.443	Oct 2023	-		2.443	Continuing	Continuing	Continuing
Govt Eng Support	WR	FRC : Jacksonville, FL	0.575	0.079	Nov 2021	0.134	Nov 2022	0.136	Nov 2023	-		0.136	Continuing	Continuing	Continuing
Govt Software Eng Support	WR	NAWCWD : PT Mugu	5.590	1.035	Nov 2021	1.008	Nov 2022	1.008	Nov 2023	-		1.008	Continuing	Continuing	Continuing
Aircraft Integration	WR	FRC East : Cherry Point, NC	0.400	0.200	Apr 2022	0.204	Nov 2022	0.224	Nov 2023	-		0.224	Continuing	Continuing	Continuing
Govt Software Eng Support	WR	NRL : Washington, DC	14.176	1.927	Nov 2021	1.140	Nov 2022	1.140	Nov 2023	-		1.140	Continuing	Continuing	Continuing
Primary HW Dev DAIRCM	C/CPFF	DRS Sysco : Melbourne, FL	68.986	18.884	May 2022	4.923	Mar 2023	24.628	Nov 2023	-		24.628	Continuing	Continuing	Continuing
H-1 Operational Flight Program Dev	C/CPFF	Bell Tech : Fort Worth, TX	0.556	0.488	May 2022	0.000		0.000		-		0.000	0.000	1.044	-
Prior Year (Product Development) costs no longer funded in FYDP	Various	Various : Various	64.753	0.000		0.000		0.000		-		0.000	0.000	64.753	-
Subtotal			164.426	26.679		10.117		29.729		-		29.729	Continuing	Continuing	N/A
Remarks															
(1) FY24 decrease (\$0.150M) H-1 Operational Flight Program Dev at Northrop Grumman due to planned completion of work within the FY.															
(2) FY24 increase (\$0.035M) Govt Eng Support at NAWCAD Patuxent River, MD to account for the addition of A-Kit design for H-1 to be completed by Government vice Bell Tech.															
(3) FY24 increase (\$0.002M) Govt Eng Support at FRC Jacksonville, FL to account for inflation.															
(4) FY24 increase (\$0.020M) FRC East Cherry Point, NC to support platform integration and technical documentation.															
(5) FY24 increase (\$19.705M) DRS Sysco, Melbourne, FL. for continued development and delivery of EDM control processors, EDM Lasers, EDM Sensors, and EDM Fiber optic Cable Assemblies. Additionally, continued OFP software development, including development and incorporation of advanced missile tracking algorithms and Hostile Fire indication algorithms.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0604272N / Tact Air Dir Infrared CM (TA DIRCM)

Project (Number/Name)

3348 / DAIRCM Development

Support (\$ in Millions)

				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Govt Integrated Logistic Support	WR	Fleet Readiness Depot : Jacksonville, FL	0.144	0.163	Oct 2021	0.160	Oct 2022	0.163	Oct 2023	-		0.163	Continuing	Continuing	Continuing
Logistic Deliverables	SS/CPFF	RIAC : Ft. Belvoir, VA	0.789	0.156	Nov 2021	0.158	Nov 2022	0.161	Nov 2023	-		0.161	Continuing	Continuing	Continuing
ESOH support	WR	NAWC WD : China Lake	0.139	0.008	Nov 2021	0.008	Nov 2022	0.008	Nov 2023	-		0.008	0.000	0.163	-
Integrated Logistic Support	C/CPAF	Wyle Laboratories : Lexington Park, MD	0.441	0.156	Apr 2022	0.000		0.000		-		0.000	0.000	0.597	0.300
Comercial Shipping TAC code	TBD	Various : Various	0.055	0.045	Nov 2021	0.030	Oct 2022	0.030	Oct 2023	-		0.030	Continuing	Continuing	Continuing
ESOH Support	SS/CPFF	RIAC : Ft. Belvoir, VA	0.048	0.037	Nov 2021	0.032	Nov 2022	0.032	Nov 2023	-		0.032	Continuing	Continuing	Continuing
Govt Integrated Logistics Support	WR	NAWCAD : Patuxent River, MD	0.451	0.570	Oct 2021	0.260	Oct 2022	0.265	Oct 2023	-		0.265	Continuing	Continuing	Continuing
Subtotal			2.067	1.135		0.648		0.659		-		0.659	Continuing	Continuing	N/A

Remarks

- (1) FY24 increase (\$0.003M) FRC Depot Jax, FL to account for inflation.
 (2) FY24 increase (\$0.003M) Logistic Deliverables, RIAC Ft. Belvoir, VA to account for inflation.
 (3) FY24 increase (\$0.005M) Govt Integrated Logistics Support, NAWCAD Patuxent River, MD to account for inflation.

Test and Evaluation (\$ in Millions)

				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NAWCAD : Patuxent River, MD	9.772	0.652	Oct 2021	1.022	Oct 2022	1.052	Oct 2023	-		1.052	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NAWCWD : China Lake, CA	6.442	0.053	Nov 2021	0.829	Nov 2022	0.853	Nov 2023	-		0.853	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	C/CPFF	GWEF : Eglin AFB, FL	1.955	0.214	Jun 2022	0.200	Dec 2022	0.200	Dec 2023	-		0.200	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604272N / Tact Air Dir Infrared CM (TA DIRCM)					Project (Number/Name) 3348 / DAIRCM Development				
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	COTF : Various	1.642	0.195	Jan 2022	0.579	Jan 2023	0.494	Jan 2024	-		0.494	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	CRANE : CRANE	1.050	0.100	Jan 2022	0.109	Jan 2023	0.111	Jan 2024	-		0.111	0.000	1.370	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	C/CPFF	NAWCWD : Point Mugu, CA	0.483	1.035	Nov 2021	0.000		0.000		-		0.000	0.000	1.518	-
Prior Year Live Fire Test & Evaluation Not Funded FYDP (PYLFT&E)	Various	Various : Various	0.915	0.554	Jun 2022	0.000		0.000		-		0.000	0.000	1.469	0.450
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	Various	Various : Various	5.247	0.000		0.000		0.000		-		0.000	0.000	5.247	-
Subtotal			27.506	2.803		2.739		2.710		-		2.710	Continuing	Continuing	N/A
Remarks															
(1) FY24 increase (\$0.030M) Gov T&E Support at NAWCAD Patuxent River, MD due to increasing DAIRCM test requirements.															
(2) FY24 increase (\$0.024M) NAWCWD China Lake, CA to support FY24 testing of EDM systems.															
(3) FY24 decrease (\$0.085M) Govt T&E Support at COTF due to reduced test support requirements.															
(4) FY24 increase (\$0.002M) Govt T&E Support at Crane to account for inflation.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Mgmt Support	C/CPFF	Amelex : California, MD	0.161	0.219	Jan 2022	0.147	Jan 2023	0.149	Jan 2024	-		0.149	0.000	0.676	-
Contractor Eng Support	C/CPFF	Various : Various	1.161	0.398	Jan 2022	0.103	Jan 2023	0.105	Jan 2024	-		0.105	0.000	1.767	-
Travel	WR	NAVAIR Various : Patuxent River, MD	0.343	0.360	Jun 2022	0.320	Oct 2022	0.350	Oct 2023	-		0.350	0.000	1.373	-
Govt PM Support	WR	NAWCAD : Patuxent River, MD	1.025	0.916	Dec 2021	0.934	Oct 2022	0.962	Oct 2023	-		0.962	0.000	3.837	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604272N / Tact Air Dir Infrared CM (TA DIRCM)						Project (Number/Name) 3348 / DAIRCM Development			
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
DISA	C/BA	NAVIDFOR : Suffolk, VA	0.020	0.020	Jun 2022	0.020	Jun 2023	0.020	Jun 2024	-		0.020	0.000	0.080	-
Prior Year (Management Services) costs no longer funded in FYDP	Various	Various : Various	0.239	0.000		0.000		0.000		-		0.000	0.000	0.239	-
Subtotal			2.949	1.913		1.524		1.586		-		1.586	0.000	7.972	N/A
Remarks															
(1) FY24 increase (\$0.002M) Contract Mgmt Support Amelex, California, MD to account for inflation.															
(2) FY24 increase (\$0.002M) Contract Eng Support Various, Various to account for inflation.															
(3) FY24 increase (\$0.030M) Govt travel as program shifts from design to Government test.															
(4) FY24 increase (\$0.028M) Gov PM Support NAWCAD Patuxent River, MD as program shifts from design to Government test.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			196.948	32.530		15.028		34.684		-		34.684	Continuing	Continuing	N/A
Remarks															

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PE 0604272N: *Tact Air Dir Infrared CM (TADIRCM)*
Navy

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Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name) PE 0604272N / <i>Tact Air Dir Infrared CM (TA DIRCM)</i>
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Project (Number/Name)	3348 / DAIRCM Development
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DAIRCM Program of Record																																
Fiscal Year	FY22				FY23				FY24				FY25				FY26				FY27				FY28							
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4								
	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS	OND	JFM	AMJ	JAS								
Acquisition & JCIDS Milestones																																
Contract & Delivery																																
Milestones																																
SE/LOG/T&E Events																																
Platform & Software																																
Builds																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604272N / <i>Tact Air Dir Infrared CM (TA DIRCM)</i>	Project (Number/Name) 3348 / <i>DAIRCM Development</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
DAIRCM				
Acquisition Milestones: DAIRCM Final Capability Development Document (CDD): Schedule Detail	3	2022	3	2022
Acquisition Milestones: DAIRCM MSC Decision: Schedule Detail	4	2025	4	2025
Acquisition Milestones: Full-Rate Production Decision (FRPD): Schedule Detail	2	2027	2	2027
Acquisition Milestones: Initial Operational Capability (IOC): Schedule Detail	3	2028	3	2028
Acquisition Milestones: DAIRCM Test Readiness Review (TRR) IOT&E Gate: TRR 1	2	2023	2	2023
Acquisition Milestones: DAIRCM Test Readiness Review (TRR) IOT&E Gate: TRR 2	4	2023	4	2023
Acquisition Milestones: DAIRCM CDR: Schedule Detail	1	2022	1	2022
Acquisition Milestones: DAIRCM SVR/FC/A/PRR: Schedule Detail	3	2025	3	2025
Test and Evaluation: DAIRCM Development Flight Test: Schedule Detail	2	2024	1	2025
Test and Evaluation: DAIRCM Integrated Test (IT): Schedule Detail	1	2026	3	2026
Test and Evaluation: FY25 DAIRCM Live Fire Test & Evaluation (LFT&E): Schedule Detail	1	2025	2	2025
Test and Evaluation: DAIRCM Operational Test (OT): Schedule Detail	4	2026	4	2026
Test and Evaluation: FY26 DAIRCM LFT&E: Schedule Detail	3	2026	4	2026
Contract Milestones: Low-Rate Initial Production (LRIP) Award: Schedule Detail	1	2026	1	2026
Contract Milestones: Full-Rate Production (FRP) Award: Schedule Detail	2	2027	2	2027
Deliveries: Engineering Design Model (EDM) Hardware Deliveries: Schedule Detail	4	2022	1	2024
Deliveries: LRIP Deliveries: Schedule Detail	3	2026	3	2028
Deliveries: FRP Deliveries: Schedule Detail	3	2028	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604272N / Tact Air Dir Infrared CM (TA DIRCM)				Project (Number/Name) 9999 / Congressional Adds			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: Congressional Adds	0.000	0.000	24.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	24.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
FY 2023 Congressional Add: Tactical Aircraft Directable Infrared Countermeasure program (TADIRCM) for continued focus to develop and field the Distributed Aperture Infrared Countermeasure System (DAIRCM) for enhanced rotary aircraft survivability. DAIRCM is part of the long-term strategy for sustainable, cyber-secure aviation survivability against future battlefield threats and the funding request in fiscal year 2023 supports development of the program of record.												
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2022	FY 2023			
Congressional Add: Distributed aperture infrared countermeasures								0.000	24.000			
FY 2022 Accomplishments: N/A												
FY 2023 Plans: Conduct developmental flight test and integrated flight test as well as continue software development required to correct deficiencies found in SIL and flight test events. Finalize SIL testing and lead platform A-kit integration. Install EDM systems into developmental flight test aircraft. Conduct test events in the Guided Weapons Evaluation Facility (GWEF) and the Navy Infrared Countermeasures Effectiveness Laboratory (NICEL) to assist in determining system effectiveness.												
Congressional Adds Subtotals								0.000	24.000			
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
• RDTE/0604272N/3348: TADIRCM/DAIRCM Development	32.530	15.028	34.684	-	34.684	22.146	15.422	14.569	15.169	Continuing	Continuing	
• APN/0576: Distributed Aperture Infrared Countermeasures (DAIRCM)	2.006	32.311	1.500	-	1.500	14.584	22.931	21.559	34.042	203.838	415.287	
• APN/0605: (9504) Common ECM Mod Spares (OCO)	6.867	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.867	
Remarks												
APN/0576 represents one (1) OSIP (OSIP 018-17 Distributed Aperture Infrared Countermeasures (DAIRCM)) from the Common ECM Equipment budget.												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604272N / Tact Air Dir Infrared CM (TA DIRCM)	Project (Number/Name) 9999 / Congressional Adds	

C. Other Program Funding Summary (\$ in Millions)											
			<u>FY 2024</u>	<u>FY 2024</u>	<u>FY 2024</u>					<u>Cost To</u>	
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Base</u>	<u>OCO</u>	<u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Complete</u>	<u>Total Cost</u>
APN/0605 represents only a portion of the total Common ECM Mod Spares budget.											

D. Acquisition Strategy

FY 2023 Congressional Add: Tactical Aircraft Directable Infrared Countermeasure program (TADIRCM).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604272N / Tact Air Dir Infrared CM (TA DIRCM)					Project (Number/Name) 9999 / Congressional Adds				
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary HW Dev DAIRCM	C/CPFF	DRS Sysco : Melbourne, FL	0.000	0.000		24.000	Apr 2023	0.000		-		0.000	0.000	24.000	-
Subtotal			0.000	0.000		24.000		0.000		-		0.000	0.000	24.000	N/A
Remarks															
FY23 funds (\$24.000M) DRS Sysco, Melbourne, FL. to conduct developmental flight test and integrated flight test as well as continue software development required to correct deficiencies found in SIL and flight test events. Finalize SIL testing and lead platform A-kit integration. Install EDM systems into developmental flight test aircraft. Conduct test events in the Guided Weapons Evaluation Facility (GWEF) and the Navy Infrared Countermeasures Effectiveness Laboratory (NICEL) to assist in determining system effectiveness.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		24.000		0.000		-		0.000	0.000	24.000	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0604272N / Tact Air Dir Infrared CM (TA DIRCM)

Project (Number/Name)

9999 / Congressional Adds

[illegible]

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604272N / Tact Air Dir Infrared CM (TA DIRCM)	Project (Number/Name) 9999 / Congressional Adds

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
DAIRCM CONGRESSIONAL ADD				
Contract & Delivery Milestones: EMD Development Contract	3	2023	3	2025

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy</i> / BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>					R-1 Program Element (Number/Name) PE 0604289M / <i>Expeditionary Logistics</i>							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	26.954	7.796	7.342	5.991	-	5.991	9.144	10.906	11.561	8.558	Continuing	Continuing
2741: <i>Additive Manufacturing</i>	7.646	1.038	2.342	5.991	-	5.991	9.144	10.906	11.561	8.558	Continuing	Continuing
9999: <i>Congressional Adds</i>	19.308	6.758	5.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	31.066

A. Mission Description and Budget Item Justification

This program element supports cost associated with the research and development of Marine Corps Systems Command policy, acquisition process modifications, and prototyping to support the USMC Additive Manufacturing (AM) Initiative.

The USMC Additive Manufacturing Initiative is an initiative intended to give Marine units access to additive manufacturing techniques to allow them the opportunity to exercise innovation in the resolution of issues affecting unit combat readiness. This PE will support of the development of procedures to enable the approval and manufacturing of items requested from Marines. This involves the development of Marine Corps Policy, an approval process, engineering analysis and testing, establishment of facilities to produce prototype additive manufactured parts, and development of training to support the Marine Corps use of additive manufacturing. This initiative incorporates development of strategic partnerships with other DoN Systems Commands and field activities to develop DoN standards, processes, and other associated acquisition activities to support future use of additive manufacturing in DoN acquisition and readiness areas.

The Next Generation Logistics (NexLog) project supports cost associated with the research and development, experimentation, and limited, rapid fielding of emerging logistics capabilities necessary to enable the Fleet Marine Forces to execute the Marine Corps Operating Concept and inform logistics policies. These emerging logistics capabilities include development of autonomous ground, surface, and sub-surface materiel distribution systems; development of operational and tactical, in-field digital fabrication capabilities; and, the development of sensor-driven logistics information technology. This element also supports development of strategic partnerships with DoN Systems Commands and field activities in order to leverage their capabilities and align DoN standards and processes, while furthering the use of additive manufacturing, and other emerging logistics technologies, to increase warfighter readiness, capability, survivability, and effectiveness.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity		R-1 Program Element (Number/Name)				
1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0604289M / Expeditionary Logistics				
B. Program Change Summary (\$ in Millions)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget		8.071	2.342	2.408	-	2.408
Current President's Budget		7.796	7.342	5.991	-	5.991
Total Adjustments		-0.275	5.000	3.583	-	3.583
• Congressional General Reductions		-	-			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		-	5.000			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-	-			
• SBIR/STTR Transfer		-0.275	0.000			
• Rate/Misc Adjustments		0.000	0.000	3.583	-	3.583
Congressional Add Details (\$ in Millions, and Includes General Reductions)						
Project: 9999: Congressional Adds						
Congressional Add: <i>Hydrogen fuel cell technology</i>						
Congressional Add: <i>Predictive maintenance for Navy and Marine Corps weapons systems</i>						
Congressional Add: <i>Additive manufacturing part screening tool</i>						
Congressional Add Subtotals for Project: 9999						
Congressional Add Totals for all Projects						
Change Summary Explanation						
The decrease of \$1.351M from FY 2023 to FY 2024 is primarily due to the following programs adjustments within the PE:						
Increase of \$3.649M from FY 2023 to FY 2024 reflects the increase in scope, capability, and adoption of the USMC ground Additive Manufacturing digital repository, as well as the increased scope and scale of the large scale USV hull.						
Decrease of \$5.000M from FY 2023 to FY 2024 supports requirement to complete and implement at an enterprise level of the candidacy software, industrial metal printing, and digital manufacturing.						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604289M / <i>Expeditionary Logistics</i>				Project (Number/Name) 2741 / <i>Additive Manufacturing</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2741: <i>Additive Manufacturing</i>	7.646	1.038	2.342	5.991	-	5.991	9.144	10.906	11.561	8.558	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports costs associated with the research and development of Marine Corps Systems Command acquisition process modifications, prototyping, and future logistics innovations to support the USMC Additive Manufacturing (AM) Initiative under the direction of Marine Corps Systems Command. This project invests in the 3D printing of large scale constructs such as metal and polymer landing craft and concrete structures to include buildings and bridges. The USMC Additive Manufacturing Initiative is intended to give Marine units access to additive manufacturing techniques allowing them the opportunity to exercise innovation in the resolution of issues affecting unit combat readiness and sustainment.

This effort also supports the development of procedures to enable the approval and manufacturing of items requested from Marines. This involves the development of Marine Corps Policy, the digital data repository required to share equipment technical data and part designs, a part approval process, engineering analysis and testing, establishment of facilities to produce prototype additive manufactured parts, and development of training to support the Marine Corps' use of additive manufacturing. This initiative incorporates development of strategic partnerships with other DoN Systems Commands and field activities to develop DoN Standards, Processes, and other associated acquisition activities to support future use of additive manufacturing in DoN acquisition, readiness, and sustainment.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Additive Manufacturing	1.038	2.342	5.991	0.000	5.991
Articles:	-	-	-	-	-
FY 2023 Plans: - Continue the development and implementation of the digital data repository that is critical to sharing technical data across the Marine Corps and with other DoD Services and the DLA. - Continue the development of the additive manufacturing qualification and certification processes. - Continue the development of additive manufacturing technical data from legacy platforms and systems in order to increase readiness and assist with modernization efforts. - Initiate the design and development of large scale battlefield decoys using additively manufactured designs and tooling. - Initiate the development of large scale printed Unmanned Surface Vehicle (USV) and Unmanned Underwater Vehicle (UUV) hulls to enable rapid reconstitution of forces and highly tailorable designs or craft. - Initiate the use of additive manufacturing and advanced manufacturing in the use of fabricating circuit boards in expeditionary environments.					
FY 2024 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604289M / <i>Expeditionary Logistics</i>		Project (Number/Name) 2741 / <i>Additive Manufacturing</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<ul style="list-style-type: none"> - Continue the development and implementation of the digital data repository that is critical to sharing technical data across the Marine Corps and with other DoD Services and the DLA. - Continue maturing 3D printed part candidacy tools in development in order to assess USMC equipment programs in sustainment for printable parts, as well as evaluating future USMC programs under development and assessment for percentage of parts that can be 3D printed to support sustainment operations in the field and garrison. - Continue the development of large scale printed Unmanned Surface Vehicle (USV) hull to enable rapid reconstitution of forces and highly tailorable designs or craft. - Continue the use of additive manufacturing and advanced manufacturing in the use of fabricating circuit boards in expeditionary environments. <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Increase from FY 2023 to FY 2024 reflects the increase in scope, capability, and adoption of the USMC ground Additive Manufacturing digital repository, as well as the increased scope and scale of the large scale USV hull.</p>						
Accomplishments/Planned Programs Subtotals		1.038	2.342	5.991	0.000	5.991
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
<p>The AM program utilizes a non-traditional acquisition strategy due to AM being a set of enabling technologies vice a conventional platform for milestone-driven acquisition. It will incorporate strategic partnerships with other DoN activities, Joint Staff, and the other Services. For that reason, these AM investments are designed to explore future capabilities where AM may resolve gaps in logistical readiness, provide warfighting solutions, and to mitigate AM-related risk within existing programs of record.</p>						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy Date: March 2023

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604289M / <i>Expeditionary Logistics</i>	Project (Number/Name) 2741 / <i>Additive Manufacturing</i>
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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Years Cumulative Funding	Various	NA : NA	3.953	0.000		0.000		0.000		-		0.000	0.000	3.953	-
AM Digital Data Repository Prototype	MIPR	GSA : O'Fallon, IL	0.000	0.467	Mar 2022	0.545	Mar 2023	0.000		-		0.000	0.000	1.012	-
Digital Manufacturing Data Vault development	WR	NIWC PAC : San Diego, CA	0.000	0.545	Mar 2022	0.500	Mar 2023	3.083	Mar 2024	-		3.083	Continuing	Continuing	Continuing
AM of expendable UUV/ USV hull	RO	NIWC PAC : San Diego, CA	0.000	0.000		0.800	Mar 2023	2.425	Mar 2024	-		2.425	0.000	3.225	-
AM of large scale battlefield decoys	MIPR	NSWC-CD : Carderock, MD	0.000	0.000		0.250	Feb 2023	0.000		-		0.000	0.000	0.250	-
AM of circuit cards and electronics	MIPR	NSWC-CR : Crane, IN	0.000	0.000		0.100	Jan 2023	0.100	Jan 2024	-		0.100	0.000	0.200	-
Subtotal			3.953	1.012		2.195		5.608		-		5.608	Continuing	Continuing	N/A

Remarks

The Additive Manufacturing (AM) program utilizes a non-traditional acquisition strategy, due to AM being a set of enabling technologies vice a conventional platform for milestone-driven acquisition. The funding distribution above reflects research and development efforts for AM enabling technologies.

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Various	Various : Various	0.081	0.026	Jun 2022	0.065	Jun 2023	0.043	Jun 2024	-		0.043	0.000	0.215	-
AM Identify Cases for Prototypes	MIPR	NSWC : Dahlgren	0.000	0.000		0.082	Jan 2023	0.340	Jan 2024	-		0.340	0.000	0.422	-
Prior Years Cumulative Funding	Various	Vrious : Various	3.612	0.000		0.000		0.000		-		0.000	0.000	3.612	-
Subtotal			3.693	0.026		0.147		0.383		-		0.383	0.000	4.249	N/A

Remarks

The Additive Manufacturing (AM) program utilizes a non-traditional acquisition strategy, due to AM being a set of enabling technologies vice a conventional platform for milestone-driven acquisition. The funding distribution above reflects research and development efforts for AM enabling technologies.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604289M / Expeditionary Logistics					Project (Number/Name) 2741 / Additive Manufacturing			
	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	7.646	1.038		2.342		5.991		-		5.991	Continuing	Continuing	N/A

Remarks

Increase of \$3.649M from FY 2023 to FY 2024 reflects the increase in scope, capability, and adoption of the USMC ground Additive Manufacturing digital repository, as well as the increased scope and scale of the large scale Unmanned Surface Vehicle (USV) hull.

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0604289M / Expeditionary Logistics

Project (Number/Name)
2741 / Additive Manufacturing

Proj 2741	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
	Develop USMC Fleet Wide Repository																											
					AM of expendable UUV/USV hull																							
					AM of large scale battlefield decoys																							
					AM of circuit cards and electronics																							
					AM Digital Data Repository Prototype																							
					AM Identify Cases for Prototypes																							

2024DON - 0604289M - 2741

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604289M / Expeditionary Logistics	Project (Number/Name) 2741 / Additive Manufacturing	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2741				
Develop USMC Fleet Wide Repository	1	2022	4	2028
AM of expendable UUV/USV hull	1	2023	4	2025
AM of large scale battlefield decoys	1	2023	3	2024
AM of circuit cards and electronics	1	2023	4	2026
AM Digital Data Repository Prototype	1	2022	4	2023
AM Identify Cases for Prototypes	1	2023	4	2026

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604289M / <i>Expeditionary Logistics</i>				Project (Number/Name) 9999 / <i>Congressional Adds</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	19.308	6.758	5.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	31.066
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Marine Corps continues to research and evaluate next generation logistics solutions for key sustainment technologies focused on enabling and enhancing combat capabilities in support of Expeditionary Advanced Based Operations (EABO). Specifically, the USMC seeks to enhance small maneuver units' ability to generate power, create purified water, and provide for its own subsistence. This includes identifying and integrating non-traditional power and propulsion technologies to enhance sustainment and tactical advantages. In addition, the USMC will evaluate logistics technologies that operate in the surface domain to fill identified gaps relating to littoral maneuver and sustainment.

The Predictive Maintenance for Navy and Marine Corps Weapons Systems initiative supports the Condition-Based Maintenance (CBM+). CBM+ is a collaborative DoD readiness initiative focused on the development and implementation of data analysis and sustainment technology capabilities to improve weapon system availability and achieve optimum costs across the enterprise. CBM+ is the application and integration of processes, technologies, and knowledge-based capabilities to improve the reliability and maintenance effectiveness of DoD systems and components. CBM+ includes both hardware and software components or the Military Equipment (ME) to be capable of monitoring, collecting, and transferring system data.

Additive Manufacturing (AM), or 3-dimensional (3D) printing, is a technology with significant implications for the U.S. manufacturing base, naval warfare and expeditionary operations. It can shorten the design-to-production cycle, enable new designs for a multitude of items, and facilitate cost-effective on-demand manufacturing. AM provides the Marine Corps increased readiness and sustainment, extended reach, and increased lethality. AM also provides Marines the autonomy to solve problems at the forward edge of battle. As additive manufacturing evolves to produce end-use items, there is significant potential to resolve obsolescence, diminishing manufacturing sources and material shortages (DMSMS), and long lead time issues currently inherent in the fleet that will become more pervasive in EABO / DO. Additive manufacturing of components and entire platforms 'on demand' at the point of need shall support a scalable supply chain and enable a new era of supply chain independence.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023
Congressional Add: Hydrogen fuel cell technology	1.931	0.000
FY 2022 Accomplishments: - Initiate the Advancement of non-traditional energy sources and supports the Department of Defense initiative to transition to carbon and pollution-free electricity.		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604289M / <i>Expeditionary Logistics</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2022	FY 2023
- Initiate development efforts to improve recharging of battery systems from non-traditional energy sources which will increase availability, reduce costs, and decrease logistics footprints. FY 2023 Plans: N/A			
Congressional Add: Predictive maintenance for Navy and Marine Corps weapons systems FY 2022 Accomplishments: Continued the procurement of test equipment and personnel to establish the systems integration lab supporting the transition of DoD mandated CBM+ capabilities from reliability centered maintenance. The procurement of test equipment will support developmental testing to validate collection, store and transfer capabilities of CBM+ across multiple Mission Essential Equipment platforms to align with FD2030 initiatives. FY 2023 Plans: N/A		4.827	0.000
Congressional Add: Additive manufacturing part screening tool FY 2022 Accomplishments: N/A FY 2023 Plans: -Complete the development of an automated additive manufacturing part candidacy tool that evaluates technical feasibility, economic viability, and readiness drivers for Marine Corps ground system program offices. These tools will be able to leverage USMC technical and logistics data to focus resources on additively manufacturing the highest-return items. This tool will allow the Marine Corps to maximize its use of USMC and industry AM capabilities as well as create a standard operating procedure that consistently provides viable AM candidates based on repeatable grading criteria within the selection process. In addition to the software tool, the effort will include 3D printing in industrial metal of the candidate parts identified and follow on engineering evaluation, as well as integrating the data generated into the USMC's digital manufacturing repository.		0.000	5.000
Congressional Adds Subtotals		6.758	5.000
C. Other Program Funding Summary (\$ in Millions) N/A			
Remarks			
D. Acquisition Strategy Currently, the CBM+ program utilizes a non-traditional acquisition approach, due to CBM+ being a set of enabling technologies vice a conventional platform for milestone-driven acquisition. CBM+ will utilize other transaction authorities to explore partnerships with DON and commercial activities to pursue full CBM+ capabilities.			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604289M / Expeditionary Logistics	Project (Number/Name) 9999 / Congressional Adds
<p>The AM program utilizes a non-traditional acquisition strategy, due to AM being a set of enabling technologies vice a conventional platform for milestone-driven acquisition. It will incorporate strategic partnerships with other DoN activities, Joint Staff, and the other Services. For that reason, these AM investments are designed to explore future capabilities where AM may resolve gaps in logistical readiness, provide a warfighting solutions, and to mitigate AM-related risk within existing programs of record.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604289M / Expeditionary Logistics				Project (Number/Name) 9999 / Congressional Adds					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PTC Windchill Phase II - CR	MIPR	GSA : O'Fallon, Illinois	0.820	0.000		1.387	May 2023	0.000		-		0.000	0.000	2.207	-
Automated AM Part Screening and Selection Software Development	MIPR	NIWC PAC : San Diego, CA	1.072	0.000		2.928	Sep 2023	0.000		-		0.000	0.000	4.000	-
OT&E CBM+ Development & Collection Direct Cite	C/FFP	DTIC : Ft Belvoir, VA	0.000	3.423	Aug 2022	0.000		0.000		-		0.000	0.000	3.423	-
OT&E CBM+ Development & Collection Reimbursable	WR	NSWC Crane : Crane, IN	0.000	1.250	Aug 2022	0.000		0.000		-		0.000	0.000	1.250	-
OT&E CBM+ Data Scaling & Proof of Concepts	WR	GSA : Washington D.C.	0.000	0.154	Dec 2022	0.000		0.000		-		0.000	0.000	0.154	-
LIO - Hydrogen Power Technology	C/FFP	WHS : Washington, DC	0.000	1.931	Jul 2022	0.000		0.000		-		0.000	0.000	1.931	-
AM Industrial Metal Printing	MIPR	WHS : Washington, DC	0.000	0.000		0.415	Apr 2023	0.000		-		0.000	0.000	0.415	-
Prior Year Cumulative	Various	Various : Various	11.156	0.000		0.000		0.000		-		0.000	0.000	11.156	-
Subtotal			13.048	6.758		4.730		0.000		-		0.000	0.000	24.536	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
AM Fleet Support - 3D printing training and integration - RS	WR	NSWC CD : Carderock, MD	0.400	0.000		0.175	May 2023	0.000		-		0.000	0.000	0.575	-
AM Construction Structure Design	C/BA	ARMY / ERDC : Vicksburg, MS	0.000	0.000		0.095	May 2023	0.000		-		0.000	0.000	0.095	-
Prior Year Cumulative	Various	Various : Various	5.360	0.000		0.000		0.000		-		0.000	0.000	5.360	-
Subtotal			5.760	0.000		0.270		0.000		-		0.000	0.000	6.030	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604289M / Expeditionary Logistics				Project (Number/Name) 9999 / Congressional Adds					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC-CD : Carderock, MD	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	-
Subtotal			0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			19.308	6.758		5.000		0.000		-		0.000	0.000	31.066	N/A
Remarks															

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PE 0604289M: *Expeditionary Logistics*
Navy

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Project (Number/Name)	9999 / Congressional Adds
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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604289M / Expeditionary Logistics	Project (Number/Name) 9999 / Congressional Adds	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Expeditionary Logistics				
(LIO) Capabilities Development Contract (CTMA): Contract Award	3	2022	3	2023
CBM+: CBM+ Development	3	2022	4	2023
Additive Manufacturing: Part Candidacy Software Development	4	2023	4	2024
Additive Manufacturing: Digital Repository Development	3	2023	1	2024
Additive Manufacturing: Industrial Metal Printing Development	3	2023	3	2024
Additive Manufacturing: CERL Support	3	2023	3	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	PE 0604292N / <i>FUTURE VERTICAL LIFT (MARITIME STRIKE)</i>											
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	5.038	8.269	5.103	2.100	-	2.100	0.000	0.000	0.000	0.000	0.000	20.510
2940: <i>Future Vertical Lift (Maritime Strike)</i>	5.038	8.269	5.103	2.100	-	2.100	0.000	0.000	0.000	0.000	0.000	20.510

A. Mission Description and Budget Item Justification

Future Vertical Lift (Maritime Strike) (FVL (MS)) directs a Naval Aviation initiative to close key warfighting gaps and recapitalize capabilities lost when legacy rotary wing platforms (MH-60R, MH-60S, and MQ-8C) reach service-life limits beginning in the late 2020s. The FVL (MS) program will develop and field more capable, maintainable and reliable crewed and uncrewed rotorcraft systems to meet the needs of the Navy. FVL (MS) will be a key component of Distributed Maritime Operations (DMO) which will add warfighting capabilities in long-range Intelligence, Surveillance, Reconnaissance, and Targeting (ISR&T), Surface Warfare, Undersea Warfare (Anti-Submarine Warfare and Mine Warfare), Air Warfare, Electronic Warfare, Naval Special Warfare, Personnel Recovery, Patient Movement, Humanitarian Assistance/Disaster Relief and Combat Logistics. The activities conducted under this program will contribute to the acquisition documentation required to support a Milestone A (MS-A) decision and enable Technology Maturation and Risk Reduction (TMRR) key activities. These efforts will enable timely development of a system that provides best value and capability to the warfighter while maintaining effective and efficient war fighting capability in support of the Navy's 30-year Aviation Plan.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	8.274	5.103	0.000	-	0.000
Current President's Budget	8.269	5.103	2.100	-	2.100
Total Adjustments	-0.005	0.000	2.100	-	2.100
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.005	0.000			
• Program Adjustments	0.000	0.000	2.100	-	2.100

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604292N / FUTURE VERTICAL LIFT (MARITIME STRIKE)	
<p>Change Summary Explanation</p> <p>Cost: FY 2024 funding request is increased since the previous President's Budget submission, \$2.100 million for Future Vertical Lift (Maritime Strike) Post Analysis of Alternatives (AoA) activities.</p> <p>Technical: Not applicable.</p> <p>Schedule: Not applicable.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604292N / FUTURE VERTICAL LIFT (MARITIME STRIKE)				Project (Number/Name) 2940 / Future Vertical Lift (Maritime Strike)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2940: Future Vertical Lift (Maritime Strike)	5.038	8.269	5.103	2.100	-	2.100	0.000	0.000	0.000	0.000	0.000	20.510
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Future Vertical Lift (Maritime Strike)(FVL (MS)) project directs developmental activities in support of the replacement of the current inventory of Navy helicopters in the 2030+ timeframe. Specific development activities required for FVL (MS) may include: capability requirements definition, documentation, and validation; Analysis of Alternatives (AoA) planning and execution including AoA Study Guidance and Study Plan preparation); completion of affordability studies; establishment of the appropriate security environment (e.g. computers, facilities, and administration); production of an Acquisition Strategy (AS), Life Cycle Cost Estimate (LCCE), Life Cycle Sustainment Plan (LCSP), Systems Engineering Plan (SEP), and Draft Capability Development Document (CDD); Request for Proposal (RFP) development: acquisition documentation; risk reduction initiatives; design trade studies; and support to joint FVL, including open hardware and software reference and objective architectures definition, mission system interoperability, and shipboard compatibility. Follow-on activities support preparation and execution of efforts to develop common systems reference and objective open architectures, and eventual prototype aircraft flight demonstrations in support of the FVL Technology Maturation and Risk Reduction (TMRR) acquisition phase. Activities and technologies developed also have the potential to be leveraged for sustainment of legacy Navy helicopters. These efforts will enable timely development of a system that provides best value and capability to the Joint Warfighter while maintaining effective and efficient war fighting capability in support of the Navy's 30 year Aviation Plan.

FY 2024 budget funds the FVL (MS) post-AoA follow-on activities to include analyses, studies and development of acquisition documentation. Tasks to be performed may include post-AoA support, acquisition program management functions, engineering modeling and analysis, conceptual design trade studies, and other related follow on activities.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: FVL (MS) Requirements Definition and Acquisition Documentation	8.269	5.103	2.100	0.000	2.100
Articles:	-	-	-	-	-
FY 2023 Plans: Post-AoA follow-on activities to include analyses, studies and production of acquisition documentation. Tasks to be performed may include post-AoA support, acquisition program management functions, engineering modeling and analysis, system specification and Draft CDD development, design trade studies, virtual simulation, conceptual design of Air Vehicle, Avionics, Propulsion and Dynamics, Communications and Navigation, Weapons and Fire Control, Human Systems Integration, Survivability and Vulnerability, Missions and Missions Systems Management, Reliability and Maintainability, Training, Logistics, Sensor, Pilotage and Targeting					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604292N / <i>FUTURE VERTICAL LIFT (MARITIME STRIKE)</i>		Project (Number/Name) 2940 / <i>Future Vertical Lift (Maritime Strike)</i>		
<u>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</u>						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Systems, VMS/Flight Control, Software/Hardware architecture. and other related follow on activities. Support for these efforts will come from government, industry and academia such as Naval Research Labs, DARPA, Georgia Tech Research Institute, John Hopkins APL, Penn State University Applied Research Lab, and various industry partners. Production of MS-A supporting documents may include but are not limited to: an Acquisition Strategy (AS), Life Cycle Cost Estimate (LCCE), Life Cycle Sustainment Plan (LCSP) and Systems Engineering Plan (SEP).</p> <p><i>FY 2024 Base Plans:</i> Post-AoA follow-on activities to include analyses, studies and production of acquisition documentation. Tasks to be performed may include post-AoA support, acquisition program management functions, engineering modeling and analysis, system specification and Draft CDD development, design trade studies, virtual simulation, conceptual design of Air Vehicle, Avionics, Propulsion and Dynamics, Communications and Navigation, Weapons and Fire Control, Human Systems Integration, Survivability and Vulnerability, Missions and Missions Systems Management, Reliability and Maintainability, Training, Logistics, Sensor, Pilotage and Targeting Systems, VMS/Flight Control, Software/Hardware architecture. and other related follow on activities. Support for these efforts will come from government, industry and academia such as Naval Research Labs, DARPA, Georgia Tech Research Institute, John Hopkins APL, Penn State University Applied Research Lab, and various industry partners. Production of MS-A supporting documents may include but are not limited to: an Acquisition Strategy (AS), Life Cycle Cost Estimate (LCCE), Life Cycle Sustainment Plan (LCSP) and Systems Engineering Plan (SEP).</p> <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Decrease from FY 2023 to FY 2024 reflects the completion of the AoA and the transition into post-AoA efforts such as documentation development, progressing towards a Milestone A program entry.</p>						
Accomplishments/Planned Programs Subtotals		8.269	5.103	2.100	0.000	2.100
<u>C. Other Program Funding Summary (\$ in Millions)</u>						
N/A						
<u>Remarks</u>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604292N / FUTURE VERTICAL LIFT (MARITIME STRIKE)	Project (Number/Name) 2940 / Future Vertical Lift (Maritime Strike)

D. Acquisition Strategy

The Analysis of Alternatives (AoA) was initiated in 2QFY2022 to begin the assessment of the technical feasibility, operational feasibility, technical risk, and affordability of potential materiel and non-materiel solutions. The AoA will be completed in 1QFY2023 resulting in a recommendation for post-AoA follow-on efforts and a Milestone A entry. In FY 2024, post-AoA follow-on efforts will occur.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604292N / FUTURE VERTICAL LIFT (MARITIME STRIKE)						Project (Number/Name) 2940 / Future Vertical Lift (Maritime Strike)			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prototype Systems	C/FFP	Northrop Grumman : Woodland Hills, CA	0.000	2.027	Jun 2022	0.000		0.000		-		0.000	0.000	2.027	2.027
Prototype Systems	C/FFP	Lockheed Martin : Owego, NY	0.000	0.500	Nov 2022	0.000		0.000		-		0.000	0.000	0.500	0.500
Subtotal			0.000	2.527		0.000		0.000		-		0.000	0.000	2.527	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NAWC AD : Patuxent River, MD	2.450	3.772	Nov 2021	3.066	Nov 2022	1.261	Nov 2023	-		1.261	0.000	10.549	-
Trade Studies/ Requirements Analysis	Various	Various : Various	0.884	0.161	Nov 2021	1.000	Dec 2022	0.412	Dec 2023	-		0.412	0.000	2.457	2.457
AoA Study	C/CPFF	RAND Corporation : Washington, DC	1.250	0.575	Nov 2021	0.000		0.000		-		0.000	0.000	1.825	1.825
Architecture Framework Analysis	Various	Various : Various	0.000	0.704	Dec 2021	0.500	Dec 2022	0.206	Dec 2023	-		0.206	0.000	1.410	1.410
Subtotal			4.584	5.212		4.566		1.879		-		1.879	0.000	16.241	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	WR	NAWC AD : Patuxent River, MD	0.454	0.530	Nov 2021	0.517	Nov 2022	0.213	Nov 2023	-		0.213	0.000	1.714	-
Travel	Various	Various : Various	0.000	0.000		0.020	Oct 2022	0.008	Oct 2023	-		0.008	0.000	0.028	-
Subtotal			0.454	0.530		0.537		0.221		-		0.221	0.000	1.742	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604292N / FUTURE VERTICAL LIFT (MARITIME STRIKE)				Project (Number/Name) 2940 / Future Vertical Lift (Maritime Strike)				
	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5.038	8.269		5.103		2.100		-		2.100	0.000	20.510	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy												Date: March 2023																		
Appropriation/Budget Activity 1319 / 4												R-1 Program Element (Number/Name) PE 0604292N / FUTURE VERTICAL LIFT (MARITIME STRIKE)								Project (Number/Name) 2940 / Future Vertical Lift (Maritime Strike)										
Proj 2940	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028					
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q		
	Analysis of Alternatives Study																													
	Program Planning and Documentation																													
Milestones																														
												MS-A ▲																		
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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604292N / FUTURE VERTICAL LIFT (MARITIME STRIKE)	Project (Number/Name) 2940 / Future Vertical Lift (Maritime Strike)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2940				
Analysis of Alternatives	2	2022	1	2023
Program Planning and Documentation	1	2022	4	2024
Milestones: MS-A	4	2024	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	PE 0604320M / Rapid Technology Capability Prototype											
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	23.208	11.199	67.927	131.763	-	131.763	18.202	18.254	18.121	18.384	Continuing	Continuing
0386: Rapid Prototype Development, Marine Corps	20.312	6.372	62.927	131.763	-	131.763	18.202	18.254	18.121	18.384	Continuing	Continuing
9999: Congressional Adds	2.896	4.827	5.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.723

A. Mission Description and Budget Item Justification

The Commandant of the Marine Corps (CMC) directed the formation of the Marine Corps Rapid Capabilities Office (MCRCO) to seek emergent and disruptive capability for rapid transition to the Fleet Marine Forces (FMF), increasing survivability, lethality, and effectiveness of the operational force. Prototypes transition to FMF will be at a Technology Readiness Level 7 or higher and can be either non-developmental government off the shelf, non-developmental commercial off the shelf, or developmental items.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	11.555	62.927	12.252	-	12.252
Current President's Budget	11.199	67.927	131.763	-	131.763
Total Adjustments	-0.356	5.000	119.511	-	119.511
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	5.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.356	0.000			
• Program Adjustments	0.000	0.000	-0.892	-	-0.892
• Rate/Misc Adjustments	0.000	0.000	120.403	-	120.403

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 9999: Congressional Adds

Congressional Add: Rapid technology capability prototyping

Congressional Add: Marine Corps warfighting lab partnership

Congressional Add Subtotals for Project: 9999

Congressional Add Totals for all Projects

FY 2022	FY 2023
4.827	0.000
0.000	5.000
4.827	5.000
4.827	5.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604320M / Rapid Technology Capability Prototype	
<p><u>Change Summary Explanation</u></p> <p>The increase of \$68.836M from FY 2023 to FY 2024 is due to the increase of funds supporting the Rapid Defense Experimentation Reserve (RDER) initiative, facilitating rapid modernization of the force, specifically in support of: Penetrating Affordable Autonomous Collaborative Killer - Portfolio (PAACK-P), Marine Expeditionary Littoral Persistence Surveillance (MELPS), Forward Casualty Care, Enhanced Forward Edge Command & Control, Tactical Coalition Optical Resupply of EABs (T-CORE), Resilient Maritime Communications, Seabiscuit, Autonomous Low Profile Vessel (ALPV), Resilient Expeditionary Agile Littoral Logistics (REALL), Commercial Landing Craft In Support Of (ISO) Advance Force Maneuver (CLAMM), and Project Osprey.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604320M / Rapid Technology Capability Prototype				Project (Number/Name) 0386 / Rapid Prototype Development, Marine Corps			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0386: Rapid Prototype Development, Marine Corps	20.312	6.372	62.927	131.763	-	131.763	18.202	18.254	18.121	18.384	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Commandant of the Marine Corps (CMC) directed the formation of the Marine Corps Rapid Capabilities Office (MCRCO) to seek emergent and disruptive capability for rapid transition to the Fleet Marine Forces (FMF), increasing survivability, lethality, and effectiveness of the operational force. Prototypes transition to FMF will be at a Technology Readiness Level 7 or higher and can be either non-developmental government off the shelf, non-developmental commercial off the shelf, or developmental items.

Additional details about the MCRCO, including project specifics, can be provided at a higher classification.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Product Development	3.855	55.457	117.152	0.000	117.152
Articles:	-	-	-	-	-
FY 2023 Plans: <ul style="list-style-type: none"> - Continue prototype development and operational assessment of Expeditionary Advanced Base Operations (EABO) from self-sufficiency capability. - Continue prototype development and operational assessment of Unmanned-Multi-Dimensional Battlefield Effects (UM-DBE) from Unmanned Systems. - Continue development and operational assessment of All Source/All Shooter Fires Integration (AS2FI) from Ground Based Long-Range Precision Fires. - Initiate development of capabilities for active and passive sensing and engagement concepts. - Initiate assessment of highly effective physical and non-physical counter-C5ISR. - Initiate prototype development of emergent technologies to transport logistics through the littorals and Pacific Area of Responsibility (AOR). - Initiate enhancements to the USMC's MQ-9 platforms capabilities through development of future payloads - Initiate the rapid fielding of tactical networking and processing capabilities, networked with national and in-theater tactical feeds to increase capabilities operating at the tactical edge. 					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604320M / Rapid Technology Capability Prototype		Project (Number/Name) 0386 / Rapid Prototype Development, Marine Corps		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Initiate the development of partnering crewed assets with attritable, risk-worthy uncrewed assets that will employ weapons, sensors, and communications suites to execute mission sets in an operationally relevant environment.</p> <p>FY 2024 Base Plans:</p> <p>- Complete prototype development and operational assessment of Expeditionary Advanced Base Operations (EABO) from self-sufficiency capability.</p> <p>- Complete prototype development and operational assessment of Unmanned-Multi-Dimensional Battlefield Effects (UM-DBE) from Unmanned Systems.</p> <p>- Complete development and operational assessment of All Source/All Shooter Fires Integration (AS2FI) from Ground Based Long-Range Precision Fires.</p> <p>- Complete development of capabilities for active and passive sensing and engagement concepts.</p> <p>- Complete assessment of highly effective physical and non-physical counter-C5ISR.</p> <p>- Continue the rapid fielding of tactical networking and processing capabilities, networked with national and in-theater tactical feeds to increase capabilities operating at the tactical edge.</p> <p>- Continue the development of partnering crewed assets with attritable, risk-worthy uncrewed assets that will employ weapons, sensors, and communications suites to execute mission sets in an operationally relevant environment.</p> <p>- Continue prototype development of emergent technologies to transport logistics through the littorals and Pacific Area of Responsibility (AOR).</p> <p>- Continue enhancements to the USMC's MQ-9 platforms capabilities through development of future payloads.</p> <p>- Initiate prototype development and deployment of the Marine Expeditionary Littoral Persistence Surveillance (MELPS) system.</p> <p>- Initiate experimentation opportunities to enhance casualty care at the forward edge.</p> <p>- Initiate prototype development for integrated connectivity for Marine Logisticians in a Denied, Degraded, Intermittent, and Limited (DDIL) environment.</p> <p>- Initiate prototype development to enhance resupply options at scale and speed in a degraded environment.</p> <p>- Initiate prototype development and deployment of inexpensive, resilient, and redundant communications through Proliferated Low Earth Orbit (PLEO). Experimentation will validate anticipated application in SIF operations.</p> <p>- Initiate experimentation with afloat storage and over-the-shore distribution systems for enhanced logistics resupply.</p> <p>- Initiate prototype development of an inexpensive low profile autonomous maritime delivery system.</p>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604320M / Rapid Technology Capability Prototype		Project (Number/Name) 0386 / Rapid Prototype Development, Marine Corps		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div>- Initiate experimentation with a robust sea-based logistics platform to execute fuel and refuel operations in an expeditionary form factor.</div> <div>- Initiate experimentation with commercial platforms to enhance maneuver and mobility in the littorals.</div> <div>FY 2024 OCO Plans: N/A</div> <div>FY 2023 to FY 2024 Increase/Decrease Statement: The increase from FY 2023 to FY 2024 is due to the increase of funds supporting the Rapid Defense Experimentation Reserve (RDER) initiative, facilitating rapid modernization of the force, specifically in support of: Penetrating Affordable Autonomous Collaborative Killer - Portfolio (PAACK-P), Marine Expeditionary Littoral Persistence Surveillance (MELPS), Forward Casualty Care, Enhanced Forward Edge Command & Control, Tactical Coalition Optical Resupply of EABs (T-CORE), Resilient Maritime Communications, Seabiscuit, Autonomous Low Profile Vessel (ALPV), Resilient Expeditionary Agile Littoral Logistics (REALL), Commercial Landing Craft In Support Of (ISO) Advance Force Maneuver (CLAMM), and Project Osprey. Additional details can be provided at a higher classification.</div>						
<div>Title: Support</div> <div>Articles:</div> <div>FY 2023 Plans: - Continue Navy lab support efforts to include forecasting, planning and project assessments of an innovation portfolio, modeling and simulation, and other data collection efforts. - Initiate Subject Matter Expertise (SME) and Engineering / Technical support in the roles of unmanned systems, space technology, integrated sensing, and cyber/electronic warfare.</div> <div>FY 2024 Base Plans: - Continue Navy lab support efforts to include forecasting, planning and project assessments of an innovation portfolio, modeling and simulation, and other data collection efforts. - Continue Subject Matter Expertise (SME) and Engineering / Technical support in the roles of unmanned systems, space technology, integrated sensing, and cyber/electronic warfare. - Initiate SME Engineering / Technical support for enhanced logistics and resilient communications.</div> <div>FY 2024 OCO Plans: N/A</div> <div>FY 2023 to FY 2024 Increase/Decrease Statement:</div>		1.949	4.350	8.523	0.000	8.523
		-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604320M / Rapid Technology Capability Prototype		Project (Number/Name) 0386 / Rapid Prototype Development, Marine Corps		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Increase from FY 2023 to FY 2024 is due to the increased level of SME and Engineering / Technical support required to execute the following prototyping initiatives, which have been increased in scope: unmanned systems, space technologies, enhanced over the horizon awareness, identification, and targeting, enhanced logistics and resilient communications.						
Title: Test & Evaluation		0.568	3.120	6.088	0.000	6.088
Articles:		-	-	-	-	-
FY 2023 Plans:						
- Initiate testing of active and passive sensing concepts.						
- Initiate testing of highly effective physical and non-physical counter-C5ISR.						
- Initiate testing of transport logistics through the littorals and Pacific Area of Responsibility (AOR).						
- Initiate testing efforts for the Family of Integrated Targeting Cells (FITC).						
- Initiate testing efforts of payloads for the MQ-Series Enhancements of Group 5 UAS.						
- Initiate testing efforts for low cost highly attritable aircraft technology.						
FY 2024 Base Plans:						
- Complete testing of active and passive sensing concepts.						
- Complete testing of highly effective physical and non-physical counter-C5ISR.						
- Continue testing of transport logistics through the littorals and Pacific Area of Responsibility (AOR).						
- Continue testing efforts for the Family of Integrated Targeting Cells (FITC).						
- Continue testing efforts of payloads for the MQ-Series Enhancements of Group 5 UAS.						
- Continue testing efforts for low cost highly attritable aircraft technology.						
- Initiate testing efforts for Marine Expeditionary Littoral Persistence Surveillance (MELPS).						
- Initiate testing efforts for Forward Casualty Care.						
- Initiate testing efforts for Enhanced Forward Edge Command & Control.						
- Initiate testing efforts for Tactical Coalition Optical Resupply of EABs (T-CORE).						
- Initiate testing efforts for Resilient Maritime Communications.						
- Initiate testing efforts for over-the-shore distribution systems for enhanced logistics resupply.						
- Initiate testing efforts for Autonomous Low Profile Vessel (ALPV).						
- Initiate testing efforts for Resilient Expeditionary Agile Littoral Logistics (REALL).						
- Initiate testing efforts for Commercial Landing Craft In Support Of (ISO) Advance Force Maneuver (CLAMM)						
FY 2024 OCO Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604320M / <i>Rapid Technology Capability Prototype</i>		Project (Number/Name) 0386 / <i>Rapid Prototype Development, Marine Corps</i>	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A					
<i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Increase from FY 2023 to FY 2024 is due to increased testing requirements for multiple FY24 RDER Series capabilities.					
Accomplishments/Planned Programs Subtotals	6.372	62.927	131.763	0.000	131.763
C. Other Program Funding Summary (\$ in Millions) N/A					
Remarks					
D. Acquisition Strategy The MCRCO, as an office under the Marine Corps Warfighting Laboratory (MCWL), leverages the Services' and Defense Agencies' most efficient and effective acquisition processes. The goal is to accelerate capability development, early adoption, procurement, and fielding; in order to expeditiously transition relevant capability to the warfighter.					

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604320M / Rapid Technology Capability Prototype				Project (Number/Name) 0386 / Rapid Prototype Development, Marine Corps					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Naval Force Forward	Various	NIWC LANT : Charleston, SC	0.555	0.000		0.000		0.000		-		0.000	0.000	0.555	-
Human Performance Augmentation	C/CPFF	MCSC : Quantico, VA	0.420	0.000		0.000		0.000		-		0.000	0.000	0.420	-
Organic Resource Generation	C/CPFF	MCSC : Quantico, VA	0.555	0.000		0.000		0.000		-		0.000	0.000	0.555	-
Non-Satellite Terrestrial	Various	TBD : TBD	0.699	0.001	Mar 2022	0.000		0.000		-		0.000	0.000	0.700	-
Micro-Aerial Superiority	Various	MCSC : Quantico, VA	0.325	0.001	May 2022	0.000		0.000		-		0.000	0.000	0.326	-
Multi-Spectral Deception	Various	TBD : TBD	0.225	0.001	Apr 2022	0.000		0.000		-		0.000	0.000	0.226	-
EABO Self-Sufficiency Capability	Various	MCSC : Quantico, VA	0.000	1.321	Mar 2022	0.613	Mar 2023	0.000		-		0.000	0.000	1.934	-
Unmanned, Multi-Dimensional Battlefield Effects	Various	TBD : TBD	0.000	1.279	Apr 2022	0.980	Apr 2023	0.000		-		0.000	0.000	2.259	-
All Source/All Shooter Fires Integration	Various	MCSC : Quantico, VA	0.000	1.252	May 2022	0.750	May 2023	0.000		-		0.000	0.000	2.002	-
Prior Years Cumulative Funding	Various	Various : Various	7.495	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Active and Passive Sensing	Various	WHS : TBD	0.000	0.000		1.320	Feb 2023	0.000		-		0.000	0.000	1.320	-
Counter C5ISR	Various	CERDEC : TBD	0.000	0.000		0.914	Apr 2023	0.000		-		0.000	0.000	0.914	-
Logistics Transport	Various	ONR : TBD	0.000	0.000		1.450	Apr 2023	6.260	Apr 2024	-		6.260	0.000	7.710	-
MQ-9 Enhancements	MIPR	NAWCAD : Pax River, MD	0.000	0.000		14.520	Nov 2022	1.262	Dec 2023	-		1.262	0.000	15.782	-
Low Cost Attributable Aircraft	MIPR	NAWCAD : Pax River, MD	0.000	0.000		14.360	Nov 2022	13.123	Jan 2024	-		13.123	0.000	27.483	-
FITC	Various	NSMA : Oxen Hill, MD	0.000	0.000		20.550	Jan 2023	4.949	Jan 2024	-		4.949	0.000	25.499	-
MELPS	Various	TBD : TBD	0.000	0.000		0.000		12.000	Apr 2024	-		12.000	0.000	12.000	-
Forward Casualty Care	Various	NSWCDD : NSWCDD	0.000	0.000		0.000		7.200	Apr 2024	-		7.200	0.000	7.200	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604320M / Rapid Technology Capability Prototype				Project (Number/Name) 0386 / Rapid Prototype Development, Marine Corps					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Enhanced Forward Edge C2	Various	NIWCLANT : NIWCLANT	0.000	0.000		0.000		4.500	Apr 2024	-		4.500	0.000	4.500	-
TCORE	Various	TBD : TBD	0.000	0.000		0.000		10.000	Apr 2024	-		10.000	0.000	10.000	-
Resilient Maritime Comms	Various	AFRL : AFRL	0.000	0.000		0.000		10.000	Apr 2024	-		10.000	0.000	10.000	-
Seabiscuit	Various	TBD : TBD	0.000	0.000		0.000		11.300	Apr 2024	-		11.300	0.000	11.300	-
ALPV	Various	NSWC Carderock : NSWC Carderock	0.000	0.000		0.000		1.500	Apr 2024	-		1.500	0.000	1.500	-
Osprey	Various	NAWCAD : Pax River, MD	0.000	0.000		0.000		20.000	Apr 2024	-		20.000	0.000	20.000	-
CLAMM	Various	MCSC : MCSC	0.000	0.000		0.000		19.700	Apr 2024	-		19.700	0.000	19.700	-
Subtotal			10.274	3.855		55.457		121.794		-		121.794	Continuing	Continuing	N/A
Remarks															
The increase from FY 2023 to FY 2024 is due to the increase of funds supporting the Rapid Defense Experimentation Reserve (RDER) initiative, facilitating rapid modernization of the force, specifically in support of: Penetrating Affordable Autonomous Collaborative Killer - Portfolio (PAACK-P), Marine Expeditionary Littoral Persistence Surveillance (MELPS), Forward Casualty Care, Enhanced Forward Edge Command & Control, Tactical Coalition Optical Resupply of EABs (T-CORE), Resilient Maritime Communications, Seabiscuit, Autonomous Low Profile Vessel (ALPV), Resilient Expeditionary Agile Littoral Logistics (REALL), Commercial Landing Craft In Support Of (ISO) Advance Force Maneuver (CLAMM), and Project Osprey. Additional details can be provided at a higher classification.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Analysis and program office support	C/FFP	MCSC : Quantico, VA	0.620	0.205	Mar 2022	0.000		0.000		-		0.000	0.000	0.825	-
Engineering Support	WR	NIWC LANT : Charleston, SC	0.250	0.250	Apr 2022	0.750	Apr 2023	0.000		-		0.000	0.000	1.250	-
Program and Engineering Support	WR	NSWC PCD : Panama City, FL	0.694	0.695	Apr 2022	1.135	Apr 2023	0.250	Apr 2024	-		0.250	0.000	2.774	-
Engineering Support	WR	NSWC IH : Indian Head, MD	0.545	0.550	Apr 2022	1.010	Apr 2023	0.000		-		0.000	0.000	2.105	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604320M / Rapid Technology Capability Prototype				Project (Number/Name) 0386 / Rapid Prototype Development, Marine Corps					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	C/BA	NSWC Crane : Crane, IN	0.250	0.250	Apr 2022	0.750	Apr 2023	0.250	Apr 2024	-		0.250	0.000	1.500	-
Prior Years Cumulative Funding	Various	Various : Various	0.566	0.000		0.000		0.000		-		0.000	0.000	0.566	-
Engineering Analysis and program office support	C/CPFF	DTIC : Ft. Belvoir, VA	0.000	0.000		0.705	Mar 2023	5.933	Mar 2024	-		5.933	0.000	6.638	-
Subtotal			2.925	1.950		4.350		6.433		-		6.433	0.000	15.658	N/A
Remarks Increase from FY 2023 to FY 2024 is due to the increased level of SME and Engineering / Technical support required to execute the following prototyping initiatives, which have been increased in scope: unmanned systems, space technologies, enhanced over the horizon awareness, identification, and targeting, enhanced logistics and resilient communications.															
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	C/FFP	AFRL : Rome, NY	0.890	0.000		0.000		0.000		-		0.000	0.000	0.890	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC IH : Indian Head, MD	0.512	0.000		0.000		0.000		-		0.000	0.000	0.512	-
Developmental Test & Evaluation (DT&E)	Various	Various : TBD	1.389	0.567	Mar 2022	3.120	Jun 2023	3.536	Jun 2024	-		3.536	0.000	8.612	-
Subtotal			2.791	0.567		3.120		3.536		-		3.536	0.000	10.014	N/A
Remarks Increase from FY 2023 to FY 2024 is due to increased testing requirements for multiple FY24 RDER Series capabilities.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604320M / Rapid Technology Capability Prototype						Project (Number/Name) 0386 / Rapid Prototype Development, Marine Corps			
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Years Cumulative Funding	Various	Various : Various	4.322	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			4.322	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			20.312	6.372		62.927		131.763		-		131.763	Continuing	Continuing	N/A
<div>Remarks</div> <div>Overall decrease in FY24 primarily reflects decreased OUSD R&E funding for prototype development and operational assessments of approved Rapid Defense Experimentation Reserve (RDER) initiatives; specifically, Family of Integrated Targeting Cells (FITC), MQ-Series Enhancements of Group 5 UAS and Low-Cost Highly Attributable aircraft technology.</div>															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																		Date: March 2023										
Appropriation/Budget Activity										R-1 Program Element (Number/Name)										Project (Number/Name)								
1319 / 4										PE 0604320M / Rapid Technology Capability Prototype										0386 / Rapid Prototype Development, Marine Corps								
Proj 0386	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
FY22 OA Expeditionary Advanced Base Operations (EABO)																												
FY22 OA Unmanned Multi-Dimensional Battlefield Effects (UM-DBE)																												
FY22 OA All Source/All Shooter Fires Integration (AS2FI)																												
FY22 Contract Awards		◆																										
FY22 EABO CAR			■																									
FY22 UM-DBE CAR				■																								
FY22 AS2FI CAR				■																								
Air Defense																												
C5ISR																												
Transport Logistics																												
MQ Series Enhancements																												
Low Cost Attributable Aircraft																												
FITC																												
FY23-1 Series 1 RDER Contract Award					◆																							
FY23-1 RDER Final Reports												■																
FY24-1 RDER Execution																												
FY24-2 RDER Execution																												
FY24 RDER Final Reports & Assessment																												
2024PB - 0604320M - 0386																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604320M / <i>Rapid Technology Capability Prototype</i>	Project (Number/Name) 0386 / <i>Rapid Prototype Development, Marine Corps</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 0386				
FY22 OA Expeditionary Advanced Base Operations (EABO): FY22 OA Expeditionary Advanced Base Operations (EABO)	2	2022	3	2022
FY22 OA Unmanned Multi-Dimensional Battlefield Effects (UM-DBE): FY22 OA Unmanned Multi-Dimensional Battlefield Effects (UM-DBE)	2	2022	3	2022
FY22 OA All Source/All Shooter Fires Integration (AS2FI): FY22 OA All Source/All Shooter Fires Integration (AS2FI)	2	2022	3	2022
FY22 Contract Awards: FY22 Contract Awards	2	2022	2	2022
FY22 EABO CAR: FY22 EABO CAR	3	2022	3	2022
FY22 UM-DBE CAR: FY22 UM-DBE CAR	4	2022	4	2022
FY22 AS2FI CAR: FY22 AS2FI CAR	4	2022	4	2022
Air Defense: FY23 OA Air Defense	2	2023	3	2024
C5ISRT: FY23 OA C5ISRT	2	2023	3	2024
Transport Logistics: FY23 OA Transport Logistics	2	2023	4	2024
MQ Series Enhancements: FY23 MQ-9 Enhancements	1	2023	4	2024
Low Cost Attritable Aircraft: FY23 Low Cost Attritable Aircraft	1	2023	4	2025
FITC: FY23 FITC	1	2023	4	2024
FY23-1 Series 1 RDER Contract Award: FY23 RDER Contract Award	1	2023	1	2023
FY23-1 RDER Final Reports: FY23 RDER Final Reports	4	2024	4	2024
FY24-1 RDER Execution: PAACK-P, MELPS, Forward Casualty Care, Enhanced C2, TCORE, Maritime Comms, Seabiscuit, ALPV, REALL	3	2024	4	2025
FY24-2 RDER Execution: Osprey, CLAMM	3	2024	4	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604320M / Rapid Technology Capability Prototype				Project (Number/Name) 9999 / Congressional Adds			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: Congressional Adds	2.896	4.827	5.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	12.723
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Marine Corps Rapid Capabilities Office (MCRCO) will further accelerate the identification, development and assessment of capabilities by way of non-traditional small business to support the Marine Corps Warfighting Lab (MCWL) in developing emerging capabilities for Marine Littoral Regiment (MLR) and Reconnaissance / Counter-Reconnaissance (RxR) experimentation to implement Force Design 2030.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023
<i>Congressional Add:</i> Rapid technology capability prototyping	4.827	0.000
<i>FY 2022 Accomplishments:</i> - Initiated the identification, development, and assessment of capabilities by way of non-traditional small business to support the Marine Corps Warfighting Lab (MCWL) in developing emerging capabilities for the Marine Littoral Regiment (MLR) and Reconnaissance, Counter-Reconnaissance experimentation to implement Force Design 2030.		
<i>FY 2023 Plans:</i> N/A		
<i>Congressional Add:</i> Marine Corps warfighting lab partnership	0.000	5.000
<i>FY 2022 Accomplishments:</i> N/A		
<i>FY 2023 Plans:</i> - Initiate prototype development for autonomous surface vessels in support of Reconnaissance / Counter-reconnaissance and refinement of CONOPS and CONEMPS.		
Congressional Adds Subtotals	4.827	5.000

C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTEN/0604320M/0386: <i>Rapid Prototype Development, Marine Corps</i>	6.372	62.927	131.763	-	131.763	18.202	18.254	18.121	18.384	Continuing	Continuing
Remarks											

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604320M / Rapid Technology Capability Prototype	Project (Number/Name) 9999 / Congressional Adds
D. Acquisition Strategy N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604320M / Rapid Technology Capability Prototype						Project (Number/Name) 9999 / Congressional Adds			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
GSA/AFRL (RevaComm)	TBD	AFRL : Belleville, IL	0.750	0.000	Jun 2022	0.000		0.000		-		0.000	0.000	0.750	-
MilTech	C/CPFF	AFRL : WPAFB, OH	2.146	4.827	Jun 2022	5.000	Jun 2023	0.000		-		0.000	0.000	11.973	-
Subtotal			2.896	4.827		5.000		0.000		-		0.000	0.000	12.723	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			2.896	4.827		5.000		0.000		-		0.000	0.000	12.723	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)	Program Element Description	Program Element Status	Program Element Comments

PE 0604320M / *Rapid Technology Capabilities and Prototype*

Project (Number/Name)	Start Date	End Date	Status	Manager	Budget (USD)	Actual Cost (USD)	Progress (%)	Risk Level	Notes
P001 - New Product Development	2023-01-15	2023-06-30	Completed	John Doe	1,200,000	1,150,000	100	Low	Exceeded budget by 4.2%
P002 - Website Redesign	2023-02-01	2023-05-15	In Progress	Jane Smith	350,000	320,000	85	Medium	Minor delays in content creation
P003 - Marketing Campaign Q3	2023-07-01	2023-09-30	Planned	Mike Johnson	280,000	0	0	Low	Waiting for final budget approval
P004 - IT Infrastructure Upgrade	2023-03-10	2023-08-31	On Hold	Sarah Lee	950,000	100,000	10	High	Vendor selection in progress
P005 - Customer Service Training	2023-04-01	2023-07-31	Completed	David Kim	120,000	118,000	100	Low	Positive feedback from staff
P006 - Research & Development Phase 1	2023-05-01	2023-11-30	In Progress	Emily White	700,000	450,000	65	Medium	Key milestones met on schedule
P007 - HR System Implementation	2023-06-01	2023-12-31	Planned	Chris Brown	400,000	0	0	Medium	Initial vendor selection
P008 - Quality Assurance Process Review	2023-08-01	2023-10-31	Planned	Alex Green	90,000	0	0	Low	Identifying areas for improvement
P009 - Sales Team Expansion	2023-09-01	2024-01-31	Planned	Olivia Black	300,000	0	0	Medium	Recruitment process initiated
P010 - Compliance Audit Q4	2023-10-01	2023-12-31	Planned	Benjamin Grey	150,000	0	0	Low	Scheduling external auditors

9999 / Congressional Adds

Proj 9999	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
			FY21 MilTech CARs ■																									
	FY22 Contract Award (MilTech Support Services)																											
						Low Profile Vessel Demo ●																						
						Cyber EW Payload Demo ●	FY23 Contract Award																					
											ALPV Multiple Vessels Available ●																	

2024PB - 0604320M - 9999

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604320M / Rapid Technology Capability Prototype	Project (Number/Name) 9999 / Congressional Adds	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
MilTech CARs	3	2022	3	2022
Contract Award (MilTech Support Services)	2	2022	3	2023
Low Profile Vessel Demo	2	2023	2	2023
Cyber EW Payload Demo	2	2023	2	2023
FY23 Contract Award (MilTech Support Services)	3	2023	3	2024
Autonomous Low Profile Prototypes for Fleet Experimentation	2	2024	2	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604454N / LX (R)
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COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	121.179	3.332	18.830	21.319	-	21.319	15.434	35.208	16.004	16.163	Continuing	Continuing
2474: LPD Flight II Design & Total Integration	121.179	3.332	18.830	21.319	-	21.319	15.434	35.208	16.004	16.163	Continuing	Continuing

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 542

A. Mission Description and Budget Item Justification

LPD 17 Flight II will replace LSD-41 Class ships and LSD-49 Class ships for embark, transport, control, insert, sustainment, and extract of Marine Air-Ground Task Force elements and supporting forces by helicopters, landing craft, and amphibious vehicles. Cost reduction and affordability efforts are required to continue pursuing affordability initiatives. This program element includes the planning & documentation for Developmental Test and Evaluation (DT&E), Live Fire Test & Evaluation (LFT&E), Operational Evaluation (OPEVAL), and Follow-on Operational Test and Evaluation (FOT&E) tests required for LPD 17 Flight II. These test events will be conducted on the lead Flight II Ship (LPD 30) or where configuration supports capabilities on earlier ships (LPD 28 or LPD 29).

Per signed Acquisition Decision Memorandum, LPD 17 Flight II will meet the Capabilities Development Document for LX(R) and shall subsume all previous LX(R) efforts. Name change endorsed in JROCM 093-21, from "Amphibious Ship Replacement LX(R)" to "LPD 17 San Antonio Class Amphibious Transport Dock FLT II." LPD 30 is the first ship of LPD 17 Flight II.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	3.344	26.630	18.289	-	18.289
Current President's Budget	3.332	18.830	21.319	-	21.319
Total Adjustments	-0.012	-7.800	3.030	-	3.030
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-7.800			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.012	0.000			
• Program Adjustments	0.000	0.000	2.917	-	2.917
• Rate/Misc Adjustments	0.000	0.000	0.113	-	0.113

Change Summary Explanation

Funding Change: The FY 2024 funding request was increased from FY23 to FY24 for the Air Warfare T&E requirement and for rate adjustments.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604454N / LX (R)	
Program Schedule Changes (LI 3010): LPD 30 & 31 have experienced COVID-related schedule impacts resulting in ship milestone date changes. LPD 32 delivery date shifted to reflect negotiated timeline.		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604454N / LX (R)				Project (Number/Name) 2474 / LPD Flight II Design & Total Integration			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2474: LPD Flight II Design & Total Integration	121.179	3.332	18.830	21.319	-	21.319	15.434	35.208	16.004	16.163	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 542												
A. Mission Description and Budget Item Justification												
LPD 17 Flight II will replace LSD-41 Class ships and LSD-49 Class ships for embark, transport, control, insert, sustainment, and extract of Marine Air-Ground Task Force elements and supporting forces by helicopters, landing craft, and amphibious vehicles. Cost reduction and affordability efforts are required to continue pursuing affordability initiatives. This program element includes the planning & documentation for Developmental Test and Evaluation (DT&E), Live Fire Test & Evaluation (LFT&E), Operational Evaluation (OPEVAL), and Follow-on Operational Test and Evaluation (FOT&E) tests required for LPD 17 Flight II. These test events will be conducted on the lead Flight II Ship (LPD 30) or where configuration supports capabilities on earlier ships (LPD 28 or LPD 29).												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)							FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	
Title: LPD Flight II DESIGN/TOTAL SHIP INTEGRATION							3.332	18.830	21.319	0.000	21.319	
Articles:							-	-	-	-	-	
FY 2023 Plans:												
Focus on establishing safe operating envelopes for aircraft operators and begin planning efforts for testing in FY24:												
- Begin active conduct of DT-D1 Test Events on LPD 28, to include execution of Dynamic Interface Testing (DIT) to establish safe aircraft operating envelopes resulting from aft deckhouse reductions and AEM/S mast deletion. DIT event execution involves obtaining the services of the following Rotary/Tilt Rotor Aircraft: AH-1Z, UH-1Y, H-53E, H-53K, H-60, and MV-22 including the aircrew, maintenance and fuel costs.												
- Follow-on Test & Evaluation (FOT&E) Surface Warfare (SUW) Planning resulting from updated boat/craft threat and resolve the updated Flight II SUW capability requirement.												
- Cybersecurity Test Planning and conducting the manpower and equipment intensive Cyber Cooperative Vulnerability Identification (CVI) and Adversarial Cyber DT&E (ACD) for the remaining LPD Network Enclaves: Combat. C4I, and NAV.												
- LFT&E Modeling and Simulation (M&S), to include runs of the Advanced Survivability Assessment Program (ASAP) for total ship survivability assessment, the Navy Enhanced Sierra Mechanics (NESM) for Underwater												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604454N / LX (R)		Project (Number/Name) 2474 / LPD Flight II Design & Total Integration		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Explosive/Shock simulation, and the Integrated Recoverability Model (IRM) for total ship recoverability assessment.</p> <ul style="list-style-type: none">- Interoperability Test Planning (NR-KPP).- Overall test support, documentation/plans, including Test & Evaluation Master Plan (TEMP), coordination, and event conduct support. <p>Efforts will also focus on implementation of new GFE/CFE on new construction LPDs:</p> <ul style="list-style-type: none">- Assessment of HERO/HERP for EASR, SPY-6(V)2 and other associated radar-to-ship integration activities for the new radar.- Cybersecurity risk assessments, validation, and approvals under Risk Management Framework (RMF) process for new systems.- Qualification of systems/equipment impacted by obsolescence such as shock, vibration, and EMI for new systems.- Alternative LFT&E assessments and evaluation tools for affordable assessment vs. full scale test. <p>Continue Software Support Activity/ Development & Integration for management and evaluation of new/unique LPD HM&E systems, networks, and control systems.</p> <p>FY 2024 Base Plans:</p> <p>Focus on planning efforts for testing in FY25-27:</p> <ul style="list-style-type: none">- Begin FOT&E efforts for the EASR/Self Defense, including the Plans, Exercises, Targets, and Missiles.- FOT&E (SUW) Planning resulting from updated boat/craft threat and resolve the updated Flight II SUW capability requirement.- Cybersecurity Test Planning and conducting the manpower and equipment intensive Cyber Cooperative Vulnerability Identification (CVI) and Adversarial Cyber DT&E (ACD) for each LPD Network Enclave.- Interoperability Test Planning (NR-KPP).- Overall test support, documentation/plans (TEMP), coordination, and event conduct support. <p>Efforts will also focus on implementation of new GFE/CFE on new construction LPDs:</p> <ul style="list-style-type: none">- Assessment of HERO/HERP for EASR, SPY-6(V)2 and other associated radar-to-ship integration activities for the new radar.						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604454N / LX (R)		Project (Number/Name) 2474 / LPD Flight II Design & Total Integration	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Cybersecurity risk assessments, validation, and approvals under RMF process for new systems.</p> <p>- Qualification of systems/equipment impacted by obsolescence such as shock, vibration, and EMI for new systems.</p> <p>- Alternative LFT&E assessments and evaluation tools for affordable assessment vs. full scale test.</p> <p>Continue Software Support Activity/ Development & Integration for management and evaluation of new/unique LPD HM&E systems, networks, and control systems.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: Increase from FY 2023 to FY 2024 is due to the Air Warfare T&E requirement commencing in 2024.</p>					
Accomplishments/Planned Programs Subtotals	3.332	18.830	21.319	0.000	21.319

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• SCN/3010: LPD Flight II	310.636	1,923.000	0.000	-	0.000	22.200	20.000	1.800	0.000	0.000	5,990.637
Remarks											
D. Acquisition Strategy											
Sole Source to Huntington Ingalls Industries.											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604454N / LX (R)			Project (Number/Name) 2474 / LPD Flight II Design & Total Integration				

Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Design/Systems Integration	WR	NAVSEALOGCEN : Mechanicsburg, PA	0.647	0.000		0.000		0.000		-		0.000	0.000	0.647	-
Design/Systems Integration	WR	PEO C4I/IWS : Washington, DC	7.474	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Design/Systems Integration Support	C/CPFF	General Dynamics : San Diego, CA	13.066	0.000		0.000		0.000		-		0.000	0.000	13.066	-
Design/Systems Integration	WR	NAWC Lakehurst : Lakehurst, NJ	2.056	0.049	Dec 2021	0.000		0.000		-		0.000	0.000	2.105	-
Design/Systems Integration Support	C/CPFF	HII : Pascagoula, MS	21.000	1.000	Jan 2022	0.211	Dec 2022	0.175	Dec 2023	-		0.175	0.000	22.386	-
Design/Systems Integration Support	C/CPIF	Various : Washington, DC	32.928	0.000		0.701	Dec 2022	0.492	Dec 2023	-		0.492	0.000	34.121	-
Design/Systems Integration	WR	NSWC : Bethesda, MD/Philadelphia, PA	33.384	1.075	Jan 2022	7.783	Dec 2022	8.165	Dec 2023	-		8.165	Continuing	Continuing	Continuing
Design/Systems Integration	WR	NSWC : Various	6.462	0.215	Dec 2021	4.705	Dec 2022	4.088	Dec 2023	-		4.088	0.000	15.470	-
Subtotal			117.017	2.339		13.400		12.920		-		12.920	Continuing	Continuing	N/A

Remarks

Budget exhibit was updated to accurately reflect \$13.4M in Product Development.
FY24 decrease is associated with an overall reduction in support efforts.

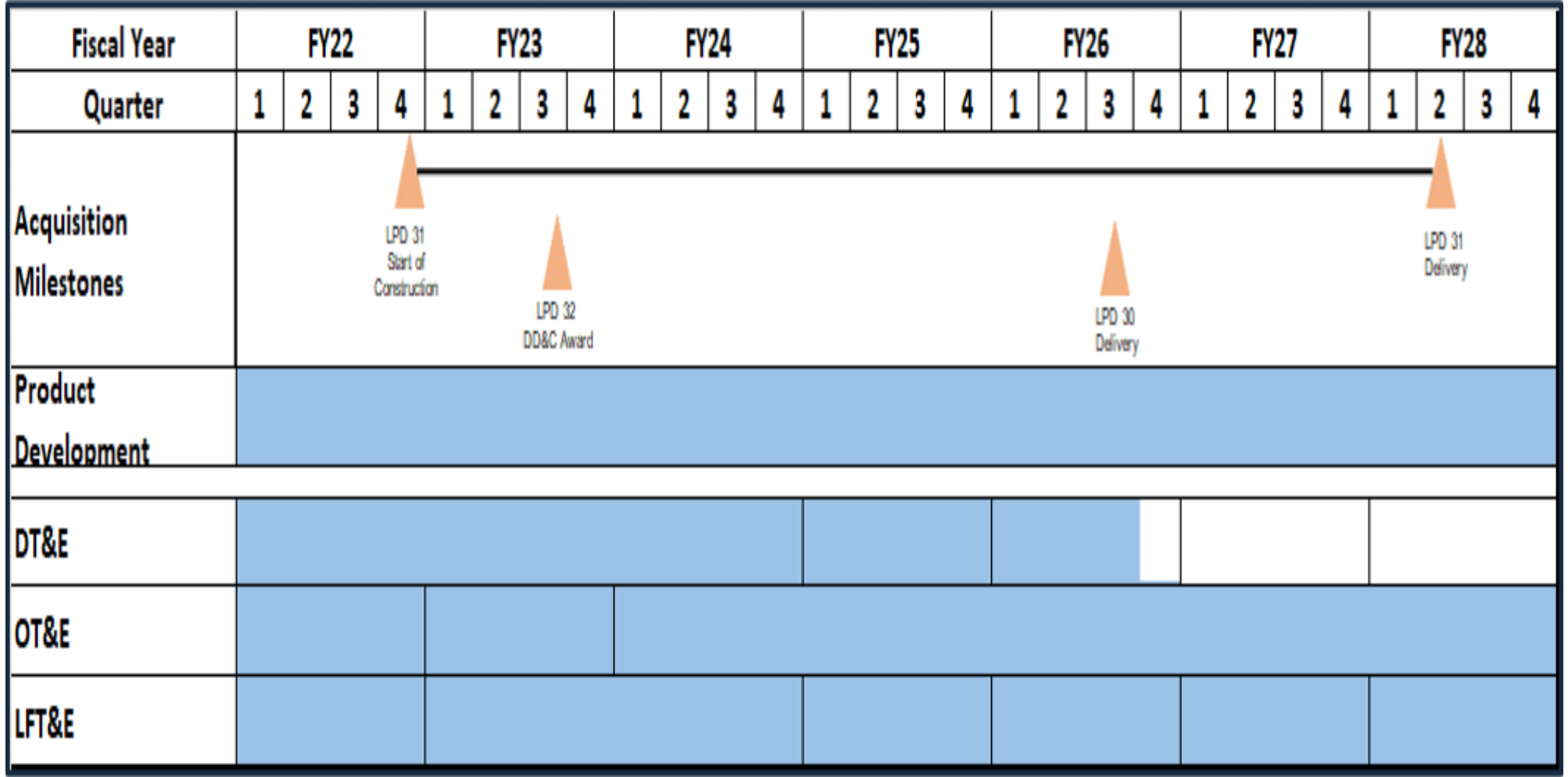
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	C/CPIF	Various : Washington, DC	1.274	0.628	Dec 2021	0.485	Nov 2022	0.466	Dec 2023	-		0.466	0.000	2.853	-
Developmental Test & Evaluation (DT&E)	C/BA	COTF : Norfolk, VA	0.485	0.075	Jan 2022	0.854	Nov 2022	0.197	Dec 2023	-		0.197	0.000	1.611	-
Developmental Test & Evaluation (DT&E)	MIPR	JITC/MCOTEA : Various	0.015	0.010	Dec 2021	0.095	Nov 2022	0.103	Dec 2023	-		0.103	0.000	0.223	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604454N / LX (R)				Project (Number/Name) 2474 / LPD Flight II Design & Total Integration					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NSWC : Bethesda, MD/Philadelphia, PA	1.400	0.280	Jan 2022	0.315	Nov 2022	0.332	Dec 2023	-		0.332	0.000	2.327	-
Developmental Test & Evaluation (DT&E)	WR	NAVAIR : Various	0.788	0.000		1.798	Nov 2022	0.392	Dec 2023	-		0.392	0.000	2.978	-
Operational Test & Evaluation (OT&E)	WR	NSWC : Various	0.000	0.000		0.000		5.541	Dec 2023	-		5.541	0.000	5.541	-
Operational Test & Evaluation (OT&E)	TBD	TBD : TBD	0.000	0.000		0.953	Nov 2022	0.929	Dec 2023	-		0.929	0.000	1.882	-
Live Fire Test & Evaluation (LFT&E)	WR	NSWC : Various	0.200	0.000		0.930	Nov 2022	0.439	Dec 2023	-		0.439	0.000	1.569	-
Subtotal			4.162	0.993		5.430		8.399		-		8.399	0.000	18.984	N/A
Remarks															
Test & Evaluation increase reflects funding for Air Warfare Ship Self Defense testing.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			121.179	3.332		18.830		21.319		-		21.319	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																Date: March 2023			
Appropriation/Budget Activity 1319 / 4								R-1 Program Element (Number/Name) PE 0604454N / LX (R)								Project (Number/Name) 2474 / LPD Flight II Design & Total Integration			



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604454N / LX (R)	Project (Number/Name) 2474 / LPD Flight II Design & Total Integration

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2474				
Developmental Test and Evaluation Phase	1	2022	3	2026
Operational Test and Evaluation Begins	1	2022	4	2028
Live Fire Test and Evaluation Phase	1	2022	4	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0604536N / Advanced Undersea Prototyping							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	431.777	30.597	94.515	104.328	-	104.328	27.156	39.330	11.839	12.796	Continuing	Continuing
3394: Adv Undersea Prototyping-Vehicles, Propulsion & Navigation	431.777	30.597	94.515	104.328	-	104.328	27.156	39.330	11.839	12.796	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Orca Extra Large Unmanned Undersea Vehicle (XLUUV) is the Navy's Extra Large UUV effort as part of the Family of UUVs. The Orca XLUUV effort is established to address a Joint Emergent Operational Need (JEON). Orca XLUUV is a multi-phased accelerated acquisition effort to rapidly deliver capability to the Fleet. Phase 1 was a competitively sourced design effort. Phase 2 down selected to one of the Phase 1 vendors in FY 2019 for fabrication and testing of the vehicle and support elements. Testing and delivery of the vehicles and support elements has been delayed to FY23-24 due to contractor challenges and supplier issues. The Navy is working with Boeing to mitigate schedule delays and execute risk reduction testing beginning in FY23 through the addition of a designated test and training asset (Vehicle 0). The Navy is updating facilities at the Naval Base Ventura County site for testing, training, and work-ups, in coordination with large unmanned surface vessel testing for cost efficiencies. Fabrication awards of additional Orca XLUUV systems are planned for FY26 and out, gradually ramping up quantities in future fiscal years, depending on the progress from the first five systems. XLUUV will have a modular payload bay, with defined interfaces that current and future payloads must adhere to for employment from the vehicle. The Orca XLUUV effort will integrate the currently required payload, and potential future payloads will be developed, evaluated, and preliminarily integrated leveraging the Core Technologies Program Element 0604029N. Additional XLUUV technologies/capabilities risk reduction will occur in parallel, leveraging the competitive Industrial base.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	31.609	116.880	74.620	-	74.620
Current President's Budget	30.597	94.515	104.328	-	104.328
Total Adjustments	-1.012	-22.365	29.708	-	29.708
• Congressional General Reductions	-	-0.357			
• Congressional Directed Reductions	-	-22.008			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.012	0.000			
• Program Adjustments	0.000	0.000	29.930	-	29.930
• Rate/Misc Adjustments	0.000	0.000	-0.222	-	-0.222

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604536N / Advanced Undersea Prototyping	
<div>Change Summary Explanation</div> <div>Technical: Not applicable.</div> <div>Schedule: Not applicable.</div> <div>Cost:</div> <div>FY 2022: -\$1.012M Small Business Innovative Research</div> <div>FY 2023: -\$22.008M Direct Congressional reduction - XLUUV testing delays, -\$0.357M general Congressional reduction</div> <div>FY 2024: +\$29.930M XLUUV Forward Operating Base and Program Wholeness; -\$0.222M Miscellaneous adjustments</div>		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604536N / <i>Advanced Undersea Prototyping</i>				Project (Number/Name) 3394 / <i>Adv Undersea Prototyping-Vehicles, Propulsion & Navigation</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3394: <i>Adv Undersea Prototyping-Vehicles, Propulsion & Navigation</i>	431.777	30.597	94.515	104.328	-	104.328	27.156	39.330	11.839	12.796	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Orca Extra Large Unmanned Undersea Vehicle (XLUUV) is the Navy's Extra Large UUV effort as part of the UUV Family of Systems (FoS). The Orca XLUUV effort has been established to address a Joint Emergent Operational Need (JEON). Orca XLUUV will have a modular payload bay, with defined interfaces that current and future payloads must adhere to for employment from the vehicle. The Orca XLUUV effort will integrate the currently required payload, and additional potential future payloads will be developed, evaluated, and preliminarily integrated under the Core Technologies Program Element 0604029N. Additional XLUUV technologies/capabilities risk reduction will occur in parallel, leveraging the competitive Industrial base.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: XLUUV Product Development	13.130	60.683	41.055	0.000	41.055
Articles:	-	-	-	-	-
<p>Description: Orca XLUUV Phase 1 design was completed via a full and open competition with two industry teams. Phase 2 fabrication was down selected to one vendor for the fabrication and delivery of 5 Orca vehicles and an additional test and training asset (Vehicle 0) was added for risk reduction. In March 2022, the Navy added a test/training asset (XLE0) and test/ fix/test level of effort (LOE) period to reduce risk of achieving performance requirements and future delivery schedule of the JEON vehicles.</p> <p>FY 2023 Plans: Continue risk reduction testing and commence test/fix/test period using XLE0. Complete Phase 2 fabrication and integration of Vehicle 1. Continue Phase 2 fabrication and integration of vehicles 2-5. Continue additional XLUUV technologies/ capabilities risk reduction leveraging the competitive Industrial base. Commence Fleet training and prepare for initial Navy testing. Begin subsystem testing for payload integration. Continue efforts and infrastructure development to support XLUUV basing, testing, training, fleet integration and CONOPs.</p> <p>FY 2024 Base Plans: Complete risk reduction testing and test/fix/test period using XLE0. Complete Phase 2 fabrication of Vehicles 2-5. Conduct contractor testing to verify system requirements on Vehicle 1-5, prepare systems for Government testing, and initiate execution of Government Testing and related fleet training. Fabrication contractor to provide</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023				
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604536N / Advanced Undersea Prototyping	Project (Number/Name) 3394 / Adv Undersea Prototyping-Vehicles, Propulsion & Navigation				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
support for test events including technical representatives and hardware to conduct events. Continue additional XLUUV technologies capabilities risk reduction leveraging the competitive Industrial base. Continue efforts and infrastructure development to support CONUS XLUUV basing, testing, training, fleet integration and CONOPs. Complete subsystem testing for payload integration to support fleet transition. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Decrease of \$19.628M due to the completion of fabrication and integration of Vehicles 2-5 in FY2024 Q3 and transition to developmental testing.							
Title: XLUUV Support Articles:			15.366 -	30.908 -	46.178 -	0.000 -	46.178 -
FY 2023 Plans: Support engineering and technical oversight of fabrication efforts and engineering services including engineering change proposals and risk mitigation studies. Review and approve CDRLs, design products, and manufacturing processes. Provide expert oversight and support of subsystem and system testing, including performing final system inspection and acceptance for vehicle 0. Provide support for Government testing planning efforts and continue safety certifications. Engage UUVRON to develop and document tactics, techniques, and procedures (TTPs) to create and validate Integrated Logistics Support products. Continue payload integration efforts.							
FY 2024 Base Plans: Support engineering and technical oversight of fabrication efforts and engineering services including engineering change proposals and risk mitigation studies. Review and approve CDRLs, test plans and procedures, and manufacturing processes. Provide expert oversight and support of subsystem and system testing, including performing final system inspection and acceptance for vehicle 1-5. Provide support for Government testing as well as Government-furnished facilities and test sites, and complete safety certifications. Government test support to include planning for and participating at multiple test events, including various Navy test range locations, including safety and range equipment. Continue to engage UUVRON to develop and document tactics, techniques, and procedures (TTPs) to validate Integrated Logistics Support products. Begin infrastructure development to support XLUUV OCONUS basing, fleet integration and in-theater forward							

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604536N / Advanced Undersea Prototyping		Project (Number/Name) 3394 / Adv Undersea Prototyping-Vehicles, Propulsion & Navigation		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
operational capability, including support platforms, trailers, maintenance equipment, and ashore hardware. Complete payload integration efforts FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$15.27M due to vehicle inspection and acceptance of 4 vehicles, commencement of support for Government testing, validation of Integrated Logistics Support products, and OCONUS basing infrastructure development.						
Title: XLUUV Test and Evaluation Articles:		0.000 -	0.000 -	14.090 -	0.000 -	14.090 -
FY 2023 Plans: N/A FY 2024 Base Plans: Fabrication contractor to provide support for test events including technical representatives and hardware to conduct events. Commence Navy developmental testing (DT) and related Fleet training. Government test support to include executing multiple test events at various Navy test range locations. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$14.090M due to commencement of Developmental Testing (DT) at the Naval Base Ventura County site.						
Title: XLUUV Management Services Articles:		2.101 -	2.924 -	3.005 -	0.000 -	3.005 -
FY 2023 Plans: Provide technical guidance, project planning, program management and travel for Orca fabrication. Provide financial and contracting support, and coordinate work with the Fleet, test support, engineering support, and contractors. FY 2024 Base Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy							Date: March 2023				
Appropriation/Budget Activity 1319 / 4			R-1 Program Element (Number/Name) PE 0604536N / Advanced Undersea Prototyping			Project (Number/Name) 3394 / Adv Undersea Prototyping-Vehicles, Propulsion & Navigation					
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)							FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Provide technical guidance, project planning, program management and travel for Orca fabrication and performance verification. Provide financial and contracting support, and coordinate work with the Fleet, test support, engineering support, and contractors.											
FY 2024 OCO Plans: N/A											
FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$0.081M due to minor adjustments in program management and technical project planning.											
Accomplishments/Planned Programs Subtotals							30.597	94.515	104.328	0.000	104.328
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• OPN 1613: Extra Large UUV	0.000	0.000	0.000	-	0.000	0.000	113.306	115.572	117.884	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
Orca XLUUV is a multi-phased accelerated acquisition effort using USC Sec. 2358 authorities to rapidly deliver capability to the Fleet. Phase 1 was a competitively sourced design effort. Two design contracts were awarded to Industry in FY 2017. Phase 2 commenced with a down select in FY 2019 to one of the Phase 1 vendors for fabrication and testing of the vehicle and support elements. Five (5) Orca XLUUV operationally relevant prototype systems (vehicles, mobile C2 equipment, and support equipment) are being fabricated for demonstration and use by the Fleet. An additional test and training asset (Vehicle 0) will be delivered to support early learning, prototyping, and in-water risk reduction testing. Additional XLUUV technologies/capabilities risk reduction will occur in parallel, leveraging the competitive Industrial base. Fabrication and award of additional Orca XLUUV systems is planned to be no earlier than FY26. Transition to an Acquisition Category (ACAT) Program and production may occur as early as FY26, pending successful completion of Government testing. XLUUV will have a modular payload bay with defined interfaces that current and future payloads must adhere to for employment from the vehicle. The Hammerhead payload is the next payload for integration with Orca XLUUV. Other potential future payloads, advanced energy solutions, and enhanced autonomy and command and control will be developed and evaluated under the Core Technologies PE 0604029N, and/or by other Science and technology organizations, and integrated into Orca XLUUV when ready. The Navy is concurrently updating facilities at the Naval Base Ventura County site for XLUUV testing, training, and work-ups, in coordination with large unmanned surface vessel testing for cost efficiencies. In parallel, the Navy is working through the process to establish future far-forward basing locations. Following successful Government testing, training, and work-ups at the Naval Base Ventura County site, the Navy will establish in-theater forward operational capability.											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604536N / <i>Advanced Undersea Prototyping</i>				Project (Number/Name) 3394 / <i>Adv Undersea Prototyping-Vehicles, Propulsion & Navigation</i>					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Payload Design documentation	C/CPIF	Various : Various	3.735	0.000		0.000		0.000		-		0.000	0.000	3.735	-
Design & Long Lead Material, including sub-systems	C/CPIF	Boeing : Huntington Beach, CA	49.558	0.000		0.000		0.000		-		0.000	0.000	49.558	-
Design & Long Lead Material, including sub-systems	C/CPIF	Lockheed Martin : Riviera Beach, FL	43.349	0.000		0.000		0.000		-		0.000	0.000	43.349	-
Fabrication of XLUUVs	C/FPIF	Boeing : Huntington Beach, CA	281.726	11.106	Dec 2021	48.698	Dec 2022	30.002	Dec 2023	-		30.002	Continuing	Continuing	Continuing
XLUUV Spares/ Maintenance	C/CPIF	Boeing : Huntington Beach, CA	0.000	0.609	Dec 2021	3.932	Dec 2022	7.349	Dec 2023	-		7.349	Continuing	Continuing	Continuing
Test support, hardware and support equipment	C/CPFF	Boeing : Huntington Beach, CA	1.690	1.415	Dec 2021	8.053	Dec 2022	3.704	Dec 2023	-		3.704	Continuing	Continuing	Continuing
Subtotal			380.058	13.130		60.683		41.055		-		41.055	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
RFP/PSPED Dev	SS/CPFF	APL/JHU : Laurel, MD	0.300	0.000		0.000		0.000		-		0.000	0.000	0.300	-
Source Selection	WR	NSWC CD : West Bethesda, MD	1.518	0.000		0.000		0.000		-		0.000	0.000	1.518	-
Source Selection	WR	SSC PAC : San Diego, CA	0.517	0.000		0.000		0.000		-		0.000	0.000	0.517	-
Engineering Support	WR	NSWC CD : West Bethesda, MD	5.426	1.317	Nov 2021	5.487	Dec 2022	4.664	Nov 2023	-		4.664	Continuing	Continuing	Continuing
Test Support	WR	NSWC CD : West Bethesda, MD	1.100	0.722	Dec 2021	1.918	Dec 2022	2.110	Dec 2023	-		2.110	Continuing	Continuing	Continuing
Engineering Support	WR	NSWC IH : Indian Head, MD	4.563	0.880	Nov 2021	1.032	Dec 2022	0.877	Nov 2023	-		0.877	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0604536N / Advanced Undersea Prototyping

Project (Number/Name)

3394 / Adv Undersea Prototyping-Vehicles, Propulsion & Navigation

Support (\$ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Test safety support	WR	NSWC IH : Indian Head, MD	0.000	0.173	Dec 2021	0.288	Dec 2022	0.432	Dec 2023	-		0.432	Continuing	Continuing	Continuing
Engineering and Logistic Support	WR	NUWC KPT : Keyport, WA	6.601	1.802	Nov 2021	4.750	Dec 2022	5.515	Nov 2023	-		5.515	Continuing	Continuing	Continuing
Technical Warrant Holder Support	Various	NAVSEA Activities : Washington, DC	1.702	0.280	Nov 2021	0.935	Dec 2022	0.842	Nov 2023	-		0.842	Continuing	Continuing	Continuing
Program Support	Various	Various : Various	13.096	1.782	Nov 2021	2.868	Dec 2022	2.581	Nov 2023	-		2.581	Continuing	Continuing	Continuing
OCONUS Basing Equipment	Various	Various : Various	0.000	0.000		0.000		20.700	Nov 2023	-		20.700	Continuing	Continuing	Continuing
Test Support	WR	Naval Base Ventura County : Port Hueneme, CA	0.000	1.190	Dec 2021	2.804	Dec 2022	4.281	Dec 2023	-		4.281	Continuing	Continuing	Continuing
Test Ranges and Support equipment	WR	Various : Various	0.000	0.593	Dec 2021	1.740	Dec 2022	4.176	Dec 2023	-		4.176	Continuing	Continuing	Continuing
XLUV Test Site	WR	Naval Base Ventura County : Point Mugu, CA	0.000	6.627	Dec 2021	9.086	Dec 2022	0.000		-		0.000	0.000	15.713	-
Subtotal			34.823	15.366		30.908		46.178		-		46.178	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Developmental Test & Evaluation (DT&E)	WR	Naval Base Ventura County : Point Mugu, CA	0.000	0.000		0.000		14.090	Mar 2024	-		14.090	0.000	14.090	-
Subtotal			0.000	0.000		0.000		14.090		-		14.090	0.000	14.090	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604536N / Advanced Undersea Prototyping				Project (Number/Name) 3394 / Adv Undersea Prototyping-Vehicles, Propulsion & Navigation					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Mgmt & Techncl Efforts	WR	NAVSEA Activities : WASHINGTON, D.C.	16.896	2.101	Nov 2021	2.924	Dec 2022	3.005	Dec 2023	-		3.005	Continuing	Continuing	Continuing
Subtotal			16.896	2.101		2.924		3.005		-		3.005	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			431.777	30.597		94.515		104.328		-		104.328	Continuing	Continuing	N/A
Remarks															

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PE 0604536N: *Advanced Undersea Prototyping*
Navy

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PE 0604536N / *Advanced Undersea Prototyping*

3394 / Adv Undersea Prototyping-Vehicles,
Propulsion & Navigation

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0604536N / Advanced Undersea Prototyping

Project (Number/Name)

3394 / Adv Undersea Prototyping-Vehicles, Propulsion & Navigation

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3394				
XLUUV Phase 2 Fabrication: Fabrication Contract: Fabrication Contract	1	2022	4	2024
XLUUV Phase 2 Fabrication: XLUUV Deliveries: Delivery System 0	3	2023	3	2023
XLUUV Phase 2 Fabrication: XLUUV Deliveries: Delivery System 1	2	2024	2	2024
XLUUV Phase 2 Fabrication: XLUUV Deliveries: Delivery Systems 2	3	2024	3	2024
XLUUV Phase 2 Fabrication: XLUUV Deliveries: Delivery Systems 3	3	2024	3	2024
XLUUV Phase 2 Fabrication: XLUUV Deliveries: Delivery System 4	3	2024	3	2024
XLUUV Phase 2 Fabrication: XLUUV Deliveries: Delivery System 5	4	2024	4	2024
XLUUV Phase 2 Fabrication: XLUUV Testing: Vehicle 0 Risk Reduction Testing	3	2022	2	2024
XLUUV Phase 2 Fabrication: DT&E	3	2024	1	2025
XLUUV Phase 2 Fabrication: OT&E	1	2025	1	2025
XLUUV Phase 2 Fabrication: Payload Integration: Integration	3	2023	3	2024
XLUUV Phase 2 Fabrication: XLUUV Employment:	3	2025	4	2028
XLUUV Procurement Fabrication: Production Contract: Production	2	2026	4	2028
XLUUV Procurement Fabrication: XLUUV Option Awards: Additional system option 1	2	2026	2	2026
XLUUV Procurement Fabrication: XLUUV Option Awards: Additional system option 2	2	2027	2	2027
XLUUV Procurement Fabrication: XLUUV Option Awards: Additional system option 3	2	2028	2	2028
XLUUV Test Site: Test Site Stand-up and Operation: XLUUV Test Site:	1	2022	4	2025

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
1319: <i>Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	PE 0604636N I <i>Counter Unmanned Aircraft System (C-UAS)</i>											
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	5.548	5.462	7.438	11.567	-	11.567	14.396	14.494	8.261	8.427	Continuing	Continuing
2073: <i>DRAKE 2.0 C-UAS Afloat</i>	0.000	0.000	6.018	10.194	-	10.194	12.731	12.922	6.910	7.050	Continuing	Continuing
3241: <i>Counter Unmanned Aircraft Systems (C-UAS)</i>	5.548	5.462	1.420	1.373	-	1.373	1.665	1.572	1.351	1.377	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Counter Unmanned Aircraft System (C-UAS) program employs integrated C-UAS solution sets designed to protect high value or critical Naval assets from surveillance, or hostile threats posed from the inadvertent or unlawful misuse of unmanned aircraft systems (UAS). The C-UAS program provides an integrated Family of Systems (FoS) employing advanced target discrimination and defeat capabilities to meet fleet requirements. More details available at a higher classification level.

FY 2024 funding is requested to continue management and implementation of system assessment. Provide program management and systems engineering support for the technology development and acquisition strategy for fielding material solution. Funding provides for refinement of material solutions, threat assessments, identification and development of advanced target discrimination, defeat capabilities, and prototype development for integration into the C-UAS FoS.

Continues refinement of open architecture solution and interoperability standards for a C-UAS FoS. In partnership with the Joint C-UAS Office (JCO), will identify or develop additional detect and deter capabilities to integrate into the C-UAS FoS. As the JCO designated CORIAN Acquisition Lead, continued development, implementation and integration of additional sensor modalities to improve system detect/ID/track/defeat capabilities. Continues efforts to improve interoperability between ashore and afloat C-UAS systems.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	5.529	7.438	8.430	-	8.430
Current President's Budget	5.462	7.438	11.567	-	11.567
Total Adjustments	-0.067	0.000	3.137	-	3.137
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.067	0.000			
• Program Adjustments	0.000	0.000	3.600	-	3.600
• Rate/Misc Adjustments	0.000	0.000	-0.463	-	-0.463

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	
1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	PE 0604636N / Counter Unmanned Aircraft System (C-UAS)	
<div>Change Summary Explanation</div> <div>FY 2022 funding request reduced by 67K</div> <div>FY 2023 No changes</div> <div>FY 2024 funding request increased by \$3,3137K for DRAKE 2.0 Development (\$3,600K) and miscellaneous reductions (-\$463K).</div> <div>FY 2024 funding request reduced by \$0.492M due to material solutions and assessments. (Project 3241)</div>		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604636N / Counter Unmanned Aircraft System (C-UAS)				Project (Number/Name) 2073 / DRAKE 2.0 C-UAS Afloat			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2073: DRAKE 2.0 C-UAS Afloat	0.000	0.000	6.018	10.194	-	10.194	12.731	12.922	6.910	7.050	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The DRAKE Counter Unmanned Aircraft Systems (CUAS) is an Electronic Warfare (EW) Force Protection system designed to detect, identify, track, and defeat small Unmanned Aircraft Systems (sUAS) for afloat naval forces. To meet the non-kinetic requirements established in the OPNAV Top Level Requirement (TLR) for Afloat CUAS, the DRAKE system will be upgraded with improved radios, processors, and display units.

The program will utilize Commercial Off-The-Shelf (COTS) hardware, software, and advanced techniques to develop, test, and integrate into DRAKE. Increment 1 upgrades will focus on refreshing the core technology to replace legacy hardware with the latest COTS processors/controllers, which will significantly increase signal processing speed and bandwidth (NextGen SDR). These improvements will enable the system to counter more advanced commercial sUAS efficiently. A COTS tablet-like Graphical User Interface (GUI) called the Control Display Unit (CDU) 2.0 will replace the legacy CDU, providing enhanced visual tracking and identification data of UAS. This upgrade will ultimately improve situational awareness and signal analysis for the warfighter. In Increment 2, the DRAKE system will be integrated with ships' Command and Control with optimized antennas for C-sUAS mission to enhance ships' situational awareness and prosecution of UAS threats.

Prior to FY23, DRAKE C-UAS funding can be found in PE 0603654N/Project 3177.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: DRAKE	0.000	6.018	10.194	0.000	10.194
Articles:	-	-	-	-	-
FY 2023 Plans: Complete integration of Increment 1 NextGen SDR hardware and software, and CDU 2.0. Develop and test advanced techniques to address evolving advanced threats. Begin testing and evaluation of NextGen SDR hardware and software, and CDU 2.0.					
FY 2024 Base Plans: Continue Test and Evaluation of NextGen SDR hardware and software. Develop, Test, and Integrate CUAS Software application required for CDU 2.0. Provide limited quantity of CDU 2.0 for for purpose of technology demonstration to the fleet DRAKE operators. Begin development of Increment 2 Optimized Antenna, Docking station, and Command and Control(C2) integration.					
FY 2024 OCO Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604636N / <i>Counter Unmanned Aircraft System (C-UAS)</i>		Project (Number/Name) 2073 / <i>DRAKE 2.0 C-UAS Afloat</i>	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A					
<i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Increase of \$4.176 from FY2023 to FY2024 to accelerate and complete development and delivery of DRAKE (CDU 2.0 & Docking station).					
Accomplishments/Planned Programs Subtotals	0.000	6.018	10.194	0.000	10.194
C. Other Program Funding Summary (\$ in Millions) N/A					
Remarks					
D. Acquisition Strategy Develop, integrate, test, and field hardware and software upgrades, and advanced techniques in DRAKE systems through the Technology Insertion and Technology Refresh process. Technology insertion candidates include the techniques, hardware and software performance improvements developed by United States Government (USG) laboratories, Federally Funded Research and Development Centers (FFRDCs), University Affiliated Research Centers (UARCs), and the JCREW prime contractor. Hardware and software updates will be integrated, tested, and implemented in DRAKE via Engineering Change Proposals (ECPs).					

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604636N / Counter Unmanned Aircraft System (C-UAS)				Project (Number/Name) 2073 / DRAKE 2.0 C-UAS Afloat					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Development	C/FFP	Northrop Grumman : San Dieco, CA	0.000	0.000		0.662	Jan 2023	1.093	Jan 2024	-		1.093	Continuing	Continuing	Continuing
Systems Engineering	C/FFP	Northrop Grumman : San Dieco, CA	0.000	0.000		0.602	Jan 2023	1.035	Jan 2024	-		1.035	Continuing	Continuing	Continuing
Software Development	C/FFP	Northrop Grumman : San Dieco, CA	0.000	0.000		0.722	Jan 2023	2.985	Jan 2024	-		2.985	Continuing	Continuing	Continuing
System Integration	C/FFP	Northrop Grumman : San Dieco, CA	0.000	0.000		0.602	Jan 2023	1.398	Jan 2024	-		1.398	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		2.588		6.511		-		6.511	Continuing	Continuing	N/A
Remarks FY23 to FY24 increased for CDU 2.0 development, testing, and fielding.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Loadset Development	Various	NSWC : Various	0.000	0.000		0.751	Nov 2022	0.825	Nov 2023	-		0.825	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC : Various	0.000	0.000		1.354	Nov 2022	1.453	Nov 2023	-		1.453	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		2.105		2.278		-		2.278	Continuing	Continuing	N/A
Remarks FY23 to FY24 increase associated with Loadset development, testing, integration of Next Generation Hardware & Software supporting Increment 1.															
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	Various	Various : Various	0.000	0.000		1.325	Nov 2022	1.405	Nov 2023	-		1.405	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		1.325		1.405		-		1.405	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023				
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604636N / Counter Unmanned Aircraft System (C-UAS)					Project (Number/Name) 2073 / DRAKE 2.0 C-UAS Afloat					
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		6.018		10.194		-		10.194	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy												Date: March 2023					
Appropriation/Budget Activity 1319 / 4								R-1 Program Element (Number/Name) PE 0604636N / Counter Unmanned Aircraft System (C-UAS)						Project (Number/Name) 2073 / DRAKE 2.0 C-UAS Afloat			

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 2073																												
Inc 1 Development and Integration																												
Inc 1 Test and Evaluation																												
Inc 2 Development and Integration																												
Inc 2 Test and Evaluation																												
Advanced Techniques Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604636N / Counter Unmanned Aircraft System (C-UAS)	Project (Number/Name) 2073 / DRAKE 2.0 C-UAS Afloat

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2073				
Inc 1 Development and Integration	1	2023	2	2024
Inc 1 Test and Evaluation	2	2024	2	2025
Inc 2 Development and Integration	1	2025	3	2026
Inc 2 Test and Evaluation	2	2026	4	2027
Advanced Techniques Development	1	2023	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604636N / Counter Unmanned Aircraft System (C-UAS)				Project (Number/Name) 3241 / Counter Unmanned Aircraft Systems (C-UAS)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3241: Counter Unmanned Aircraft Systems (C-UAS)	5.548	5.462	1.420	1.373	-	1.373	1.665	1.572	1.351	1.377	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Counter Unmanned Aircraft System (C-UAS) program employs integrated C-UAS solution sets designed to protect high value or critical Naval assets from surveillance, espionage, or hostile threats posed from the inadvertent or unlawful misuse of unmanned aircraft systems (UAS). The C-UAS program provides an integrated Family of Systems (FoS) employing advanced target discrimination and defeat capabilities to meet fleet requirements. More details available at a higher classification level.

FY 2024 funding is requested to continue management and implementation of system assessment. Provide program management and systems engineering support for the technology development and acquisition strategy for fielding material solution. Funding provides for refinement of material solutions, threat assessments, identification and development of advanced target discrimination, defeat capabilities, and prototype development for integration into the C-UAS FoS.

Continues refinement of open architecture solution and interoperability standards for a C-UAS FoS. In partnership with the Joint C-UAS Office (JCO) will identify or develop additional detect and deter capabilities to integrate into the C-UAS FoS. As the JCO designated CORIAN Acquisition Lead, will continue development, implementation and integration of additional sensor modalities to improve system detect/ID/track/defeat capabilities. Will continue efforts to improve interoperability between ashore and afloat C-UAS systems.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: C-UAS System Development and Integration	5.462	1.420	1.373	0.000	1.373
Articles:	-	-	-	-	-
FY 2023 Plans: Continue management and implementation of system assessment. Provide program management, and systems engineering support for the technology development and acquisition strategy for fielding material solution. Funding provides for refinement of material solutions, threat assessments, identification and development of advanced target discrimination, defeat capabilities, development for integration into the C-UAS FoS. Continue management and technical support for C-UAS Systems Integration Lab (SIL). In partnership with the Joint C-UAS Office (JCO) will identify or develop additional detect and deter capabilities to integrate into the C-UAS FoS. As the JCO designated CORIAN Acquisition Lead, continue development, implementation and integration of additional sensor modalities to improve system detect/ID/track/defeat capabilities. Develop efforts to improve					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604636N / Counter Unmanned Aircraft System (C-UAS)	Project (Number/Name) 3241 / Counter Unmanned Aircraft Systems (C-UAS)	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>interoperability between ashore and afloat C-UAS systems. Funding provides for continued development of data fusion architecture for external sensor integration into a C-UAS common Command and Control (C2).</p> <p><i>FY 2024 Base Plans:</i> Continue management and implementation of system assessment. Provide program management, and systems engineering support for the technology development and acquisition strategy for fielding material solution. Funding provides for refinement of material solutions, threat assessments, identification and development of advanced target discrimination, defeat capabilities, development for integration into the C-UAS FoS. Continue management and technical support for C-UAS Systems Integration Lab (SIL). In partnership with the Joint C-UAS Office (JCO) will identify or develop additional detect and deter capabilities to integrate into the C-UAS FoS. As the JCO designated CORIAN Acquisition Lead, will continue development, implementation and integration of additional sensor modalities to improve system detect/ID/track/defeat capabilities. Will continue efforts to improve interoperability between ashore and afloat C-UAS systems. Funding provides for continued development of data fusion architecture for external sensor integration into a C-UAS common Command and Control (C2).</p> <p><i>FY 2024 OCO Plans:</i> N/A</p> <p><i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Decrease of \$0.047 from FY2023 to FY2024 due to the reduction in material solutions and assessments.</p>					
Accomplishments/Planned Programs Subtotals	5.462	1.420	1.373	0.000	1.373

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Navy's acquisition strategy capitalizes on prior Rapid Development Capability efforts while leveraging JCO investments with the Program Office acting as Lead Systems Integrator. This acquisition strategy maintains commonality of current C-UAS solutions while continuing to evaluate, improve, and implement layered defense capabilities into the integrated FoS to defeat evolving threats. More details available at a higher classification level.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604636N / Counter Unmanned Aircraft System (C-UAS)				Project (Number/Name) 3241 / Counter Unmanned Aircraft Systems (C-UAS)					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Development	Various	Various : Not Specified	0.000	1.892	Jan 2022	0.000		0.129	Jan 2024	-		0.129	Continuing	Continuing	Continuing
Subtotal			0.000	1.892		0.000		0.129		-		0.129	Continuing	Continuing	N/A
Remarks FY 2024 increased in System Development Cost supports external sensor integration with the C-UAS Family of Systems (FoS).															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Material solutions and assessments	Various	Various : Not Specified	2.959	1.749	Dec 2021	0.211	Jan 2023	0.000		-		0.000	Continuing	Continuing	Continuing
Subtotal			2.959	1.749		0.211		0.000		-		0.000	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various	Various : Not Specified	1.117	0.781	Oct 2021	0.607	Oct 2022	0.621	Nov 2023	-		0.621	Continuing	Continuing	Continuing
Government Engineering Support	WR	NAWC, Patuxent River, MD : Not Specified	1.373	0.980	Oct 2021	0.541	Oct 2022	0.561	Nov 2023	-		0.561	Continuing	Continuing	Continuing
Travel	WR	Various : Not Specified	0.099	0.060	Oct 2021	0.061	Oct 2022	0.062	Nov 2023	-		0.062	Continuing	Continuing	Continuing
Subtotal			2.589	1.821		1.209		1.244		-		1.244	Continuing	Continuing	N/A
Remarks FY 2024 Management Services increase reflects year to year inflation for Program Management, Government Engineering Support, and Travel.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604636N / Counter Unmanned Aircraft System (C-UAS)					Project (Number/Name) 3241 / Counter Unmanned Aircraft Systems (C-UAS)			
	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5.548	5.462		1.420		1.373		-		1.373	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																					Date: March 2023								
Appropriation/Budget Activity 1319 / 4												R-1 Program Element (Number/Name) PE 0604636N / Counter Unmanned Aircraft System (C-UAS)								Project (Number/Name) 3241 / Counter Unmanned Aircraft Systems (C-UAS)									
Proj 3241.L19	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	
System Development																													
	C2 Enhancement																												
	SIL Enhancement																												
Technology Maturation																													
	Follow-on Threat Assessment 2																												
Test and Evaluation																													
2024PB - 0604636N - 3241.L19																													

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604636N / Counter Unmanned Aircraft System (C-UAS)	Project (Number/Name) 3241 / Counter Unmanned Aircraft Systems (C-UAS)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3241.L19				
System Development: C2 Architecture Capability	1	2022	4	2024
System Development: SIL Enhancement	1	2022	4	2022
Technology Maturation: Follow-on Threat Assessment 2	1	2022	4	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	308.750	80.661	34.824	5.976	-	5.976	3.556	3.482	3.542	3.565	Continuing	Continuing
3378: Next Generation Strike Weapons	42.869	2.784	2.768	2.932	-	2.932	3.003	3.043	3.096	3.110	Continuing	Continuing
3407: Air Launched Decoy Development	265.112	61.700	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	326.812
3409: Advanced Aerial Refueling Store	0.000	4.608	6.705	2.216	-	2.216	0.000	0.000	0.000	0.000	0.000	13.529
3411: CAD/PAD Digital Twin Modeling	0.769	0.744	0.351	0.828	-	0.828	0.553	0.439	0.446	0.455	Continuing	Continuing
3467: Sea Launched Cruise Missile Nuclear	0.000	5.033	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.033
9999: Congressional Adds	0.000	5.792	25.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	30.792
Program MDAP/MAIS Code: Project MDAP/MAIS Code(s): 570												
A. Mission Description and Budget Item Justification												
Initial and continuing development of strike weapons consisting of armament, munitions, and weapon subsystems to allow for horizontal integration among current and future weapon system capabilities to provide enhanced anti-surface and land strike capabilities in a demanding Anti-Access Area-Denial environment. This program provides for the development of weapon and weapon system technologies to address future requirements for enhanced and alternative weapon system capability requirements that include selectable output weapons, low collateral damage weapons, precision lethality weapons, area weapons, alternative warhead technology, Insensitive Munitions (IM), scaled munitions, Department of Defense (DoD) fuzing systems, sensors, extended range weapons, precision guided training rounds, aerial refueling, fuel containment, and technologies associated with cartridge actuated devices/propellant actuated devices.												
PROJ 3378: Next Generation Strike Weapon (NGSW) Family of Systems (FoS) based on the NGLAW Analysis of Alternatives (AoA) completed with results briefed out to OSD. NGSW FoS more accurately reflects the surface/submarine capabilities for land-attack and maritime strike that the AoA results identified for the most capable and economic solutions fielding incrementally between 2020 and 2032. NGSW FoS Increments I and II will leverage mature as well as emerging technologies vice developing a single weapon. NGSW funding will maintain the security environment (enclave), facility, and study team to enable continuing analysis efforts across the FoS. The NGSW enclave ensures the Navy is able to maintain the most up to date modeled threats and validate the effectiveness of current US weapons, offensive and defensive, as well as future systems and concepts developed by industry and other DoD organizations. Maintaining this capability allows expedited analysis of systems and fully informed investment decisions.												

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 0604659N / <i>Precision Strike Weapons Development Program</i>
<p>PROJ 3407: Air-launched electronic warfare (EW) systems capability; through the integration of a Navy variant of the Miniature Air Launched Decoy (MALD). EW is an integral war-fighting effect supporting combatant commander integrated priorities, as well as Joint or Coalition operations. EW systems influence, deceive, disrupt, degrade, deny and destroy threats throughout the electromagnetic spectrum to airborne and air-launched systems and their operations. EW includes air-launched electronic attack (EA) as well as elements of electronic support (ES) and electronic protection (EP). EA provides self-protection capabilities to other weapon systems through active and passive measures that deceive threats to airborne and air-launched systems and their operations by using kinetic and non-kinetic means to defeat threats that rely on the electromagnetic spectrum, Radio Frequency (RF), Electro-Optical (EO), Infrared (IR). The ES capabilities support the collection, analysis, and dissemination of information related to the detection, geo-location, characterization, and identification of threats to airborne and air-launched systems and their operations. An air-launched EW system with stand-in capability increases the range and duration of EW systems while providing flexibility to commanders for employment. MALD is integral to realizing the National Defense Strategy of combat-credible military forces to deter war, protect the security of our nation and to enable the Joint Force to win should deterrence fail. The development and acquisition of MALD has been structured to be fielded at a pace relevant to maintain overmatch against long-term strategic competition. Specifically MALD directly contributes to building a more lethal force and is a critical enabler for joint lethality in contested environments; deterring adversaries from aggression and evolves innovative operational concepts.</p> <p>PROJ 3409: Development and fielding of the Advanced Aerial Refueling Store (AARS). The AARS effort is the result of an Operation Navy (OPNAV) Future Readiness Initiative (FRI) award. The AARS will package new technologies into this next generation Aerial Refueling Store (ARS) to support both manned and unmanned (automated) aerial refueling from platforms such as F/A-18 and MQ-25. In doing so, the AARS will facilitate tanking operations to both manned and unmanned receivers and improve safety of flight by stabilizing the aerial refueling drogue and incorporating better health and diagnostics. These improvements will be accomplished by providing updated store health message content and additional health monitoring Built-In Tests (BITS) that will be sent over the 1553 data-bus. The AARS will also add receiver and drogue position data for situational awareness and support autonomous receiver engagements of unmanned systems. This in turn will increase reliability and decrease aerial refueling mishaps, providing a significant safety and readiness improvement when compared with the current ARS.</p> <p>PROJ 3411: Cartridge Actuated Device / Propellant Actuated Device (CAD/PAD) Digital Twin Modeling to develop and validate models and algorithms for the Department of the Navy (DoN). The development effort is specific to Navy Air Crew Common Ejection Seats (NACES). These models will also be used to support initial service life decisions, service life extension decisions, and address obsolescence.</p> <p>PROJ 3467: This project will design, develop, produce and deploy a Nuclear-Armed Sea-Launched Cruise Missile (SLCM-N). SLCM-N is scoped to deliver an integrated flight system and to continue to advance SLCM-N capabilities to fully address requirements identified in the 2018 Nuclear Posture Review, SLCM-N Initial Capabilities Document, and examined in the Analysis of Alternatives to mitigate a lack of a sea based tactical nuclear based system.</p> <p>PROJ 9999: C762 Neutron radiography (N-ray) is a critical nondestructive inspection technique used to complement X-ray. N-ray and X-ray are used to detect defects and proper assembly of a variety of energetics, including Cartridge and Propellant Actuated Devices (CAD/PADs). The US Navy intends to continue to employ neutron radiographic inspection to support energetics programs for the foreseeable future.</p> <p>C880: SLCM-N This project will conduct system development and demonstration of nuclear-capable sea-launched cruise missile.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0604659N I Precision Strike Weapons Development Program				
JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.						
B. Program Change Summary (\$ in Millions)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget		89.513	84.734	7.900	-	7.900
Current President's Budget		80.661	34.824	5.976	-	5.976
Total Adjustments		-8.852	-49.910	-1.924	-	-1.924
• Congressional General Reductions		-	-0.019			
• Congressional Directed Reductions		-	-74.891			
• Congressional Rescissions		-	-			
• Congressional Adds		-	25.000			
• Congressional Directed Transfers		-	-			
• Reprogrammings		-5.000	0.000			
• SBIR/STTR Transfer		-3.852	0.000			
• Program Adjustments		0.000	0.000	-4.158	-	-4.158
• Rate/Misc Adjustments		0.000	0.000	2.234	-	2.234
Congressional Add Details (\$ in Millions, and Includes General Reductions)						
Project: 9999: Congressional Adds						
Congressional Add: Neutron radiography technologies for energetic devices						
Congressional Add: SLCM-N						
Congressional Add Subtotals for Project: 9999						
Congressional Add Totals for all Projects						
Change Summary Explanation						
PROJ 3378: NGSW						
Removed NGSW FY 2022 Threat Update						
Added NGSW FY 2028 Threat Update Q1 2028-Q4 2028						
NGSW Threat Updates Mission Modeling changed from Q1 2021-Q4 2027 to Q1 2022-Q4 2028						
NGSW Threat Updates Modeling Updates changed from Q1 2021-Q4 2027 to Q1 2022-Q4 2028						
Removed Technology Investment Enablers for INC I / INC II Capabilities Q4 2021-Q4 2021						
Study Opportunity changed from Q1 2021-Q42027 to Q1 2022-Q4 2028						
Removed Weapon/Platform Tradespace Analysis Q1 2021-Q4 2021						
Removed NGSW AoA Update						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 0604659N / <i>Precision Strike Weapons Development Program</i>
<p>Removed FY 2022 Security and HW Update Removed FY 2022 Info Update FY 2023 Security and HW Update changed from Q2 2023-Q2 2023 to Q2 2023-Q3 2023 FY 2023 Info Update changed from Q3 2023-Q3 2023 to Q3 2023-Q4 2023 FY 2024 Security and HW Update Q2 2024-Q2 2024 to Q2 2024-Q3 2024 FY 2024 Info Update Q3 2024-Q3 2024 to Q3 2024-Q4 2024 FY 2025 Security and HW Update Q2 2025-Q2 2025 to Q2 2025 Q3 2025 FY 2025 Info Update Q3 2025-Q3 2025 to Q3 2025-Q4 2025 FY 2026 Security and HW Update Q2 2026-Q2 2026 to Q2 2026-Q3 2026 FY 2026 Info Update Q3 2026-Q3 2026 to Q3 2026 Q4 2026 FY 2027 Security and HW Update Q2 2027-Q2 2027 to Q2 2027-Q3 2027 FY 2027 Info Update Q3 2027-Q3 2027 to Q3 2027-Q4 2027 Added FY 2028 Security and HW Update Q2 2028-Q3 2028 Added FY 2028 Info Update Q3 2028-Q4 2028</p> <p>PROJ 3407: Air Launched Decoy Development program was officially terminated due to inability to pace threat on 22 April 2022, removing all associated investment funding in FY 2024 and out.</p> <p>PROJ 3409: AARS Schedule changes from FY 2023. CONTRACTS: DCU/ORS Contract Award moved from FY 2022 Q3 to FY 2022 Q4 DCU/ORS OY1 Contract Award moved from FY 2023 Q3 to FY 2023 Q4 Removed Hydraulic System Contract Award OY1 from FY 2023 Q3</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program				Project (Number/Name) 3378 / Next Generation Strike Weapons			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3378: Next Generation Strike Weapons	42.869	2.784	2.768	2.932	-	2.932	3.003	3.043	3.096	3.110	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 570												
Note Starting with the FY 2022 Budget Cycle, the description for Project Unit 3378 was changed from Next Generation Land Attack Weapon (NGLAW) to Next Generation Strike Weapon (NGSW)												
A. Mission Description and Budget Item Justification Funding is provided for the Next Generation Strike Weapon (NGSW) Family of Systems (FoS) based on the NGLAW Analysis of Alternatives (AoA) completed with results briefed out to OSD. NGSW FoS more accurately reflects the surface/submarine capabilities for land-attack and maritime strike that the AoA results identified for the most capable and economic solutions fielding incrementally between 2020 and 2032. NGSW FoS Increments I and II will leverage mature as well as emerging technologies vice developing a single weapon. NGSW funding will maintain the security environment (enclave), facility, and study team to enable continuing analysis efforts across the FoS. The NGSW enclave ensures the Navy is able to maintain the most up to date modeled threats and validate the effectiveness of current US weapons, offensive and defensive, as well as future systems and concepts developed by industry and other DoD organizations. Maintaining this capability allows expedited analysis of systems and fully informed investment decisions. Further funding supports investment for technologies which enable Increment II capabilities (additional details are held at a higher classification).												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)							FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	
Title: Next Generation Strike Weapon (NGSW) Articles:							2.784	2.768	2.932	0.000	2.932	
							-	-	-	-	-	
FY 2023 Plans: Continue annual enclave security and IT updates, annual DSS updates for latest threat data and ownship defense, multidomain assessment, expanding the US capabilities database, mission integration, and lifecycle cost estimate updates as applicable. In support of NGSW FoS and continued Offensive Anti-Surface Warfare (OASUW) analysis, continue to modify TACSITs and threat postures for air, surface and subsurface launched weapons, identify new launch points and concepts for employment, mission integration and cost estimate updates as applicable. Conduct Threat Updates and Threat modeling to include threat systems against US												

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604659N / <i>Precision Strike Weapons Development Program</i>		Project (Number/Name) 3378 / <i>Next Generation Strike Weapons</i>		
<u>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</u>						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
offensive and defensive systems to ensure the enclave remains fully informed to assist senior leadership in investment decisions. Initiate update to previous NGLAW AoA and generate draft report. <i>FY 2024 Base Plans:</i> Continue annual security, IT and Decision Support System updates for latest threat data, launch platform (offensive and defensive) capabilities. Augment Multi-domain assessment of dynamic US capabilities, mission integration, and lifecycle cost estimate. Generate Course of Actions and corresponding warfighting tradespace analytical relationships of existing and future warfighting capabilities and ultimately generate and recommend potential ways to better utilize current force structures or invest more judiciously in future capabilities over time. Focus mainly on the inclusion and integration of potential uncrewed US assets into the analytical trade space as well as the value propositions of these investments over multiple geographical scenarios and time epochs. <i>FY 2024 OCO Plans:</i> N/A <i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> FY 2023 to FY 2024 increase is due to launch platform (offensive and defensive) capabilities.						
Accomplishments/Planned Programs Subtotals		2.784	2.768	2.932	0.000	2.932
<u>C. Other Program Funding Summary (\$ in Millions)</u>						
N/A						
<u>Remarks</u>						
<u>D. Acquisition Strategy</u>						
NGSW FoS more accurately reflects the multi-domain capabilities for land-attack and maritime strike that the NGLAW AoA results identified for the most capable and economic solutions fielding incrementally between 2020 and 2032. NGSW FoS Increments I and II will leverage mature as well as emerging technologies vice developing a single weapon. NGSW funding will maintain the security environment (enclave), facility, and study team to enable continuing analysis efforts across the FoS. The NGSW enclave ensures the Navy is able to maintain the most up to date modeled threats and validate the effectiveness of current US weapons, offensive and defensive, as well as future systems and concepts developed by industry and other DoD organizations. Maintaining the enclave allows expedited analysis of systems and fully informed investment decisions. NGSW FoS funding will support Increment II development of technologies to enable capabilities identified in the NGLAW AoA for integration in future systems. Additional details are held at a higher classification.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program						Project (Number/Name) 3378 / Next Generation Strike Weapons			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
INC II Technologies	C/CPFF	TBD : TBD	1.994	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
FMB withhold	TBD	TBD : TBD	10.900	0.000		0.000		0.000		-		0.000	0.000	10.900	-
Subtotal			12.894	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A
Remarks Development of technologies/components to support NGSW Increment II capabilities for integration in future systems. Additional details are held at a higher classification.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	NAWC-WD : China Lake, CA	2.475	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Development Support- AIR 4.0M	WR	NAWC-AD : Patuxent River, MD	3.192	0.057	Jan 2022	0.051	Jan 2023	0.044	Jan 2024	-		0.044	Continuing	Continuing	Continuing
Development Support	SS/CPFF	JHU/APL : Laurel, MD	9.889	2.415	Nov 2021	0.936	Dec 2022	0.701	Nov 2023	-		0.701	Continuing	Continuing	Continuing
Weapons Control System	WR	NSWC-DD : Dahlgren, VA	0.050	0.000		0.000		0.000		-		0.000	0.000	0.050	Continuing
Development Support	WR	NSMA : JBAB, DC	12.621	0.274	Jan 2022	1.702	Feb 2023	2.093	Feb 2024	-		2.093	0.000	16.690	Continuing
Development Support	MIPR	NRO : Chantilly, VA	0.569	0.000		0.000		0.000		-		0.000	0.000	0.569	Continuing
Development Support	WR	NSWC-NPT : Newport, RI	0.050	0.000		0.000		0.000		-		0.000	0.000	0.050	Continuing
Development Support	C/CPFF	SSP : WNY, DC	0.700	0.000		0.000		0.000		-		0.000	0.000	0.700	-
Subtotal			29.546	2.746		2.689		2.838		-		2.838	Continuing	Continuing	N/A
Remarks Annual enclave updates, annual DSS updates, multi-domain assessment, mission integration, support OASUW analysis, conduct SLCM-N AoA study and initiate update to previous NGLAW AoA.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023					
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program						Project (Number/Name) 3378 / Next Generation Strike Weapons					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total					
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract		
Management Support	WR	NAWC-AD : Patuxent River, MD	0.429	0.038	Jan 2022	0.079	Feb 2023	0.094	Feb 2024	-		0.094	Continuing	Continuing	Continuing		
Subtotal			0.429	0.038		0.079		0.094		-		0.094	Continuing	Continuing	N/A		
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals			42.869	2.784		2.768		2.932		-		2.932	Continuing	Continuing	N/A		
Remarks																	

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy												Date: March 2023																							
Appropriation/Budget Activity 1319 / 4												R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program												Project (Number/Name) 3378 / Next Generation Strike Weapons											
Fiscal Year	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029										
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4							
NGSW Threat Update	Threat Update				Threat Update				Threat Update				Threat Update				Threat Update				Threat Update				Threat Update										
	Mission Modeling																																		
	Modeling Updates																																		
Additional Studies	Study Opportunity																																		
Facility	Security and HW Update				Security and HW Update				Security and HW Update				Security and HW Update				Security and HW Update				Security and HW Update				Security and HW Update										
	Info Update				Info Update				Info Update				Info Update				Info Update				Info Update				Info Update										

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0604659N / Precision Strike Weapons Development Program

Project (Number/Name)

3378 / Next Generation Strike Weapons

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3378				
NGSW Threat Updates: NGSW FY 2023 Threat Update	1	2023	4	2023
NGSW Threat Updates: NGSW FY 2024 Threat Update	1	2024	4	2024
NGSW Threat Updates: NGSW FY 2025 Threat Update	1	2025	4	2025
NGSW Threat Updates: NGSW FY 2027 Threat Update	1	2027	4	2027
NGSW Threat Updates: NGSW FY 2028 Threat Update	1	2028	4	2028
NGSW Threat Updates: NGSW Threat Updates Mission Modeling	1	2022	4	2028
NGSW Threat Updates: NGSW Threat Updates Modeling Updates	1	2022	4	2028
Additional Studies: Study Opportunity	1	2022	4	2028
Facility: FY 2023 Security and HW Update	2	2023	3	2023
Facility: FY 2023 Info Update	3	2023	4	2023
Facility: FY 2024 Security and HW Update	2	2024	3	2024
Facility: FY 2024 Info Update	3	2024	4	2024
Facility: FY 2025 Security and HW Update	2	2025	3	2025
Facility: FY 2025 Info Update	3	2025	4	2025
Facility: FY 2026 Security and HW Update	2	2026	3	2026
Facility: FY 2026 Info Update	3	2026	4	2026
Facility: FY 2027 Security and HW Update	2	2027	3	2027
Facility: FY 2027 Info Update	3	2027	4	2027
Facility: FY 2028 Security and HW Update	2	2028	3	2028
Facility: FY 2028 Info Update	3	2028	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program				Project (Number/Name) 3407 / Air Launched Decoy Development			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3407: Air Launched Decoy Development	265.112	61.700	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	326.812
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops a Navy variant of the Miniature Air Launched Decoy (MALD). The variant will address current and future advanced Integrated Air Defense System (IADS) threats by bringing an air-launched, stand-in EW capability to Department of the Navy (DON) suppression of enemy air defenses/destruction of enemy air defenses (SEAD/DEAD) and standoff conventional land strike. A Navy variant of MALD with stand-in capability increases the range and duration of EW systems while providing flexibility to commanders for employment. To the maximum extent possible, the Navy will utilize existing technology from the current MALD-J production line and other common components (e.g. navigation, communication, guidance and control, payload) to reduce cost, shorten development timelines and promote interoperability. OPNAV approved requirements in a Capability Development Document (CDD) 2Q2018.

This project develops a Navy variant of the Miniature Air Launched Decoy (MALD). The variant will address current and future advanced Integrated Air Defense System (IADS) threats by bringing an air-launched, stand-in EW capability to Department of the Navy (DON) suppression of enemy air defenses/destruction of enemy air defenses (SEAD/DEAD) and standoff conventional land strike. A Navy variant of MALD with stand-in capability increases the range and duration of EW systems while providing flexibility to commanders for employment. To the maximum extent possible, the Navy will utilize existing technology from the current MALD-J production line and other common components (e.g. navigation, communication, guidance and control, payload) to reduce cost, shorten development timelines and promote interoperability. OPNAV approved requirements in a Capability Development Document (CDD) 2Q2018.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Air Launched Decoy Development	60.800	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2023 Plans: N/A					
FY 2024 Base Plans: N/A					
FY 2024 OCO Plans: N/A					
Title: Miniature Air Launched Decoy	0.900	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2023 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604659N / <i>Precision Strike Weapons Development Program</i>	Project (Number/Name) 3407 / <i>Air Launched Decoy Development</i>			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A					
FY 2024 Base Plans:					
N/A					
FY 2024 OCO Plans:					
N/A					
Accomplishments/Planned Programs Subtotals	61.700	0.000	0.000	0.000	0.000
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					
D. Acquisition Strategy					
<p>The MALD-N Acquisition Category (ACAT) II program is an evolution from the previous United States Air Force (USAF) MALD-J program and is managed by Program Executive Office, Unmanned Aviation & Strike Weapons (PEO(U&W)), PMA-201 Precision Strike Weapons Program Office. PEO(U&W) has been delegated Milestone Decision Authority (MDA) and chairs quarterly Executive Steering Boards which ensure timely communications. MALD-N is being implemented as a Model 4 acquisition program. The MALD-N program will use event-driven "Knowledge Points" (KP) at key program strategic inflection points to brief progress to stakeholders throughout the program life-cycle. The program met the statutory requirements associated with Milestone B at Knowledge Point 2 (1Q FY 2019). With the removal of FY 2020 production funding, a Quick Reaction Assessment (QRA) to support an FY 2021 Early Operational Capability (EOC) will not be conducted. The MALD-N program will continue to progress towards Initial Operational Capabilities (IOC) which will be achieved through integrated test commencing in FY 2022, followed by Initial Operational Test and Evaluation (IOT&E) in FY 2024, with asset delivery in FY 2025. MALD-N will use a capabilities-based acquisition approach to characterize performance and evolve an IOC system for Fleet integration.</p> <p>MALD is integral to realizing the National Defense Strategy of combat-credible military forces to deter war, protect the security of our nation and to enable the Joint Force to win should deterrence fail. The development and acquisition of MALD has been structured to be fielded at a pace relevant to maintain overmatch against long-term strategic competition. Specifically MALD supports greater performance of the acquisition system and is demonstrating the delivery of performance at the speed of relevance; organizational structure that supports innovation with a rapid approach that dramatically decreases the timeline from development to fielding.</p> <p>MALD-N program was terminated on 22 April 2022</p> <p>The MALD-N Acquisition Category (ACAT) II program is an evolution from the previous United States Air Force (USAF) MALD-J program and is managed by Program Executive Office, Unmanned Aviation & Strike Weapons (PEO(U&W)), PMA-201 Precision Strike Weapons Program Office. PEO(U&W) has been delegated Milestone Decision Authority (MDA) and chairs quarterly Executive Steering Boards which ensure timely communications. MALD-N is being implemented as a Model 4 acquisition</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program	Project (Number/Name) 3407 / Air Launched Decoy Development
<p>program. The MALD-N program will use event-driven "Knowledge Points" (KP) at key program strategic inflection points to brief progress to stakeholders throughout the program life-cycle. The program met the statutory requirements associated with Milestone B at Knowledge Point 2 (1Q FY 2019). With the removal of FY 2020 production funding, a Quick Reaction Assessment (QRA) to support an FY 2021 Early Operational Capability (EOC) will not be conducted. The MALD-N program will continue to progress towards Initial Operational Capabilities (IOC) which will be achieved through integrated test commencing in FY 2022, followed by Initial Operational Test and Evaluation (IOT&E) in FY 2024, with asset delivery in FY 2025. MALD-N will use a capabilities-based acquisition approach to characterize performance and evolve an IOC system for Fleet integration.</p> <p>MALD is integral to realizing the National Defense Strategy of combat-credible military forces to deter war, protect the security of our nation and to enable the Joint Force to win should deterrence fail. The development and acquisition of MALD has been structured to be fielded at a pace relevant to maintain overmatch against long-term strategic competition. Specifically MALD supports greater performance of the acquisition system and is demonstrating the delivery of performance at the speed of relevance; organizational structure that supports innovation with a rapid approach that dramatically decreases the timeline from development to fielding.</p> <p>MALD-N program was terminated on 22 April 2022</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program					Project (Number/Name) 3407 / Air Launched Decoy Development				
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	SS/CPIF	Raytheon Missile Systems : Tucson, AZ	177.823	19.664	Nov 2021	0.000		0.000		-		0.000	0.000	197.487	197.487
Subtotal			177.823	19.664		0.000		0.000		-		0.000	0.000	197.487	N/A
Remarks FY 2023 decrease is due to program cancellation. MALD-N was officially terminated on 22 April 2022 due to inability to pace threat.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Support	WR	NAWC AD : Patuxent River, MD	16.733	3.291	Nov 2021	0.000		0.000		-		0.000	0.000	20.024	-
Government Support	WR	NAWC WD : China Lake, CA	25.703	9.701	Nov 2021	0.000		0.000		-		0.000	0.000	35.404	-
Government Support	WR	NAWC WD : Point Mugu, CA	10.005	3.311	Nov 2021	0.000		0.000		-		0.000	0.000	13.316	-
Government Support	WR	NSMA : Patuxent River, MD	5.316	4.276	Nov 2021	0.000		0.000		-		0.000	0.000	9.592	-
Various	Various	Various : Various	1.813	3.322	Nov 2021	0.000		0.000		-		0.000	0.000	5.135	-
Aircraft Integration Support	SS/CPIF	Boeing : St. Louis, MO	0.000	2.500	Dec 2021	0.000		0.000		-		0.000	0.000	2.500	2.500
NSMA	WR	NSMA : Patuxent River, MD	0.000	0.900	Apr 2022	0.000		0.000		-		0.000	0.000	0.900	-
Subtotal			59.570	27.301		0.000		0.000		-		0.000	0.000	86.871	N/A
Remarks FY 2023 decrease is due to program cancellation. MALD-N was officially terminated on 22 April 2022 due to inability to pace threat.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program						Project (Number/Name) 3407 / Air Launched Decoy Development			
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NAWC AD : Patuxent River, MD	14.493	2.113	Nov 2021	0.000		0.000		-		0.000	0.000	16.606	-
Developmental Test & Evaluation (DT&E)	WR	NAWC WD : China Lake, CA	8.485	8.974	Nov 2021	0.000		0.000		-		0.000	0.000	17.459	-
Developmental Test & Evaluation (DT&E)	WR	Eglin AFB : Eglin, FL	1.209	2.239	Nov 2021	0.000		0.000		-		0.000	0.000	3.448	-
Developmental Test & Evaluation (DT&E)	WR	Various : Various	0.000	0.030	Nov 2021	0.000		0.000		-		0.000	0.000	0.030	-
Subtotal			24.187	13.356		0.000		0.000		-		0.000	0.000	37.543	N/A
Remarks															
FY 2023 decrease is due to program cancellation. MALD-N was officially terminated on 22 April 2022 due to inability to pace threat.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Support	WR	NAWC AD : Patuxent River, MD	1.397	0.000		0.000		0.000		-		0.000	0.000	1.397	-
Government Support	WR	NAWC WD : China Lake, CA	0.597	0.000	Nov 2021	0.000		0.000		-		0.000	0.000	0.597	-
Project Management Support	C/CPFF	NAWC AD : Patuxent River, MD	1.324	1.350	Nov 2021	0.000		0.000		-		0.000	0.000	2.674	2.674
Travel	Various	NAVAIR : Patuxent River, MD	0.214	0.029	Nov 2021	0.000		0.000		-		0.000	0.000	0.243	-
Subtotal			3.532	1.379		0.000		0.000		-		0.000	0.000	4.911	N/A
Remarks															
FY 2023 decrease is due to program cancellation. MALD-N was officially terminated on 22 April 2022 due to inability to pace threat.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program					Project (Number/Name) 3407 / Air Launched Decoy Development			
	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	265.112	61.700		0.000		0.000		-		0.000	0.000	326.812	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy										Date: March 2023			
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program					Project (Number/Name) 3407 / Air Launched Decoy Development			

MALD PROGRAM SCHEDULE

MALD DON24	FY 2022				FY 2023				FY 2024			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Contracts	EMD				Closeout							
			Program Cancellation 4/22/2022									
Development					Closeout							
	Payload W/SW Int											
	FOT1											
	MAC Development											
Testing	Mission Planning											
	Test Asset Delivery / Material Closeout											
	DVT and Qual Test											
	Modeling and Simulation											

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

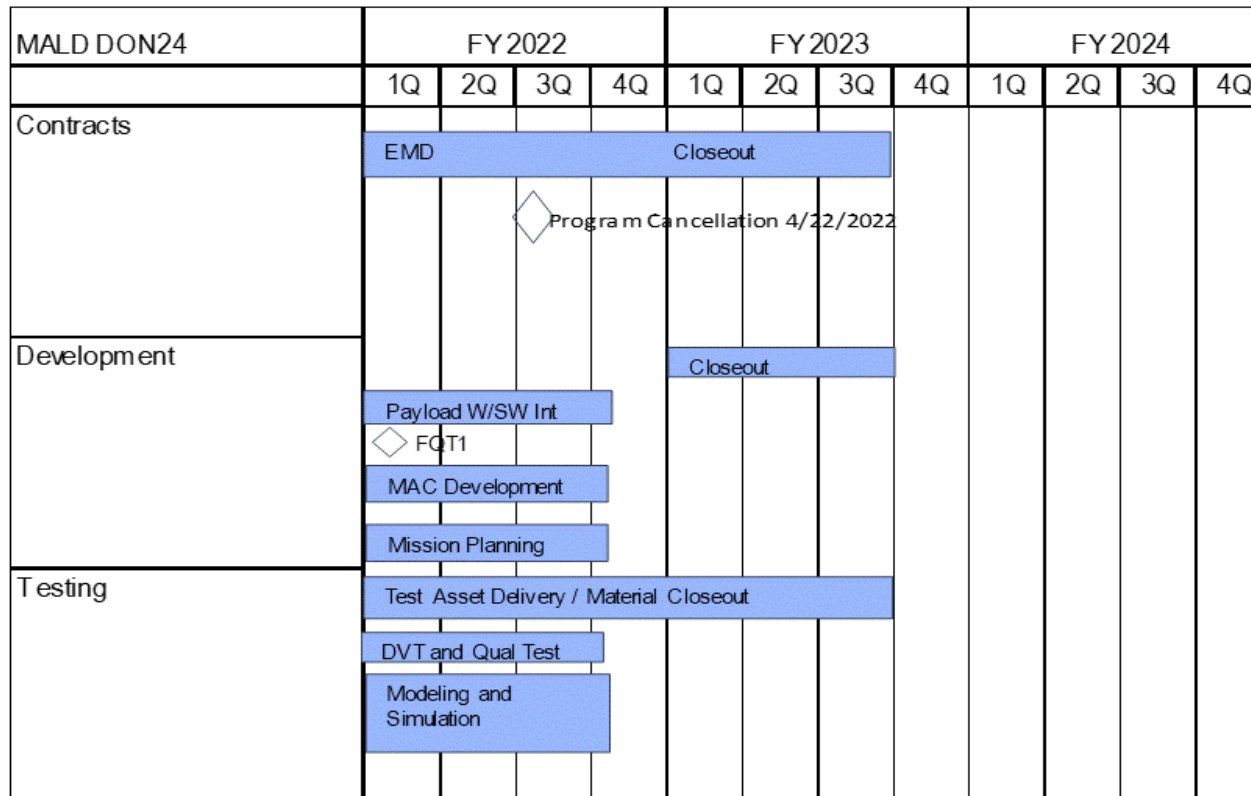
Date: March 2023

Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0604659N / Precision Strike Weapons Development Program

Project (Number/Name)
3407 / Air Launched Decoy Development

MALD PROGRAM SCHEDULE OSD24



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604659N / <i>Precision Strike Weapons Development Program</i>	Project (Number/Name) 3407 / <i>Air Launched Decoy Development</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Miniature Air Launched Decoy</i>				
Product Development: Contract Award: EMD Contract	1	2022	3	2023
Product Development: Contract Award: EMD Closeout	1	2023	3	2023
Product Development: Contract Award: Program Cancellation	3	2022	3	2022
Product Development: Product Development: Closeout	1	2023	3	2023
Product Development: Product Development: Payload HW/SW	1	2022	4	2022
Product Development: Product Development: MAC Development	1	2022	4	2022
Product Development: Product Development: Mission Planning	1	2022	4	2022
Product Development: Product Development: FQT1	1	2022	1	2022
Test and EvaluationRow: Modeling and Simulation	1	2022	4	2022
Test and EvaluationRow: DVT and Qual Test	1	2022	4	2022
Test and EvaluationRow: Test Asset Delivery	1	2022	3	2023
Test and EvaluationRow: Material Closeout	3	2022	3	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program				Project (Number/Name) 3409 / Advanced Aerial Refueling Store			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3409: Advanced Aerial Refueling Store	0.000	4.608	6.705	2.216	-	2.216	0.000	0.000	0.000	0.000	0.000	13.529
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Advanced Aerial Refueling Store (AARS) is a collection of modifications to individual Aerial Refueling Store (ARS) components that will improve performance and readiness. The ARS updates will package new technologies into the existing store that will support both manned and unmanned (automated) aerial refueling from platforms such as the F/A-18 and MQ-25. These technologies include drogue stabilization, drogue positioning sensors, advanced health and diagnostic capability and real time receiver situational awareness for the unmanned mission operator. These updates will increase safety of flight, facilitate unmanned tanking operations to both manned and unmanned receivers and improve overall ARS reliability.

The Digital Controller Upgrade (DCU) with Optical Reference System (ORS) is a hardware and software update to existing components which will provide increased flight safety through monitoring/diagnostic capabilities and enhanced situational awareness to reduce mission aborts. Drogue Stabilization incorporates hardware and software updates to improve the Aerial Refueling Stores ability to hold the drogue in position for refueling actions, and also improve the ability for the receiving platform to maneuver into position for refueling which decreases the risk of refueling mishaps, reduces mission aborts which improves operational efficiency and safety. Hydraulic System Improvements will update hardware to increase hydraulic efficiency by eliminating high failure rate components, improving fuel offload and reducing power demands on the Ram Air Turbine (RAT).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Advanced Aerial Refueling Store	4.608	6.705	2.216	0.000	2.216
Articles:	-	-	-	-	-
FY 2023 Plans: FY 2023 funding will continue the DCU and ORS development of the existing Aerial Refueling Stores. Funding provided for the development includes the surrogate flight testing of the DCU and continued development of the ORS. Other efforts include Drogue Stabilization analysis, trade studies and ORS Software Qualification.					
FY 2024 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604659N / <i>Precision Strike Weapons Development Program</i>		Project (Number/Name) 3409 / <i>Advanced Aerial Refueling Store</i>	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each) FY 2024 funding will continue the DCU development of the existing Aerial Refueling Stores and begins Hydraulic System Improvements Development. Funding provided for the development includes surrogate flight testing of the DCU and the continuation of software and power supply development and prototyping. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Decrease of \$4.489M from FY 2023 to FY 2024 due finalizing of the DCU development and transition into production/qualification efforts.	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Accomplishments/Planned Programs Subtotals	4.608	6.705	2.216	0.000	2.216

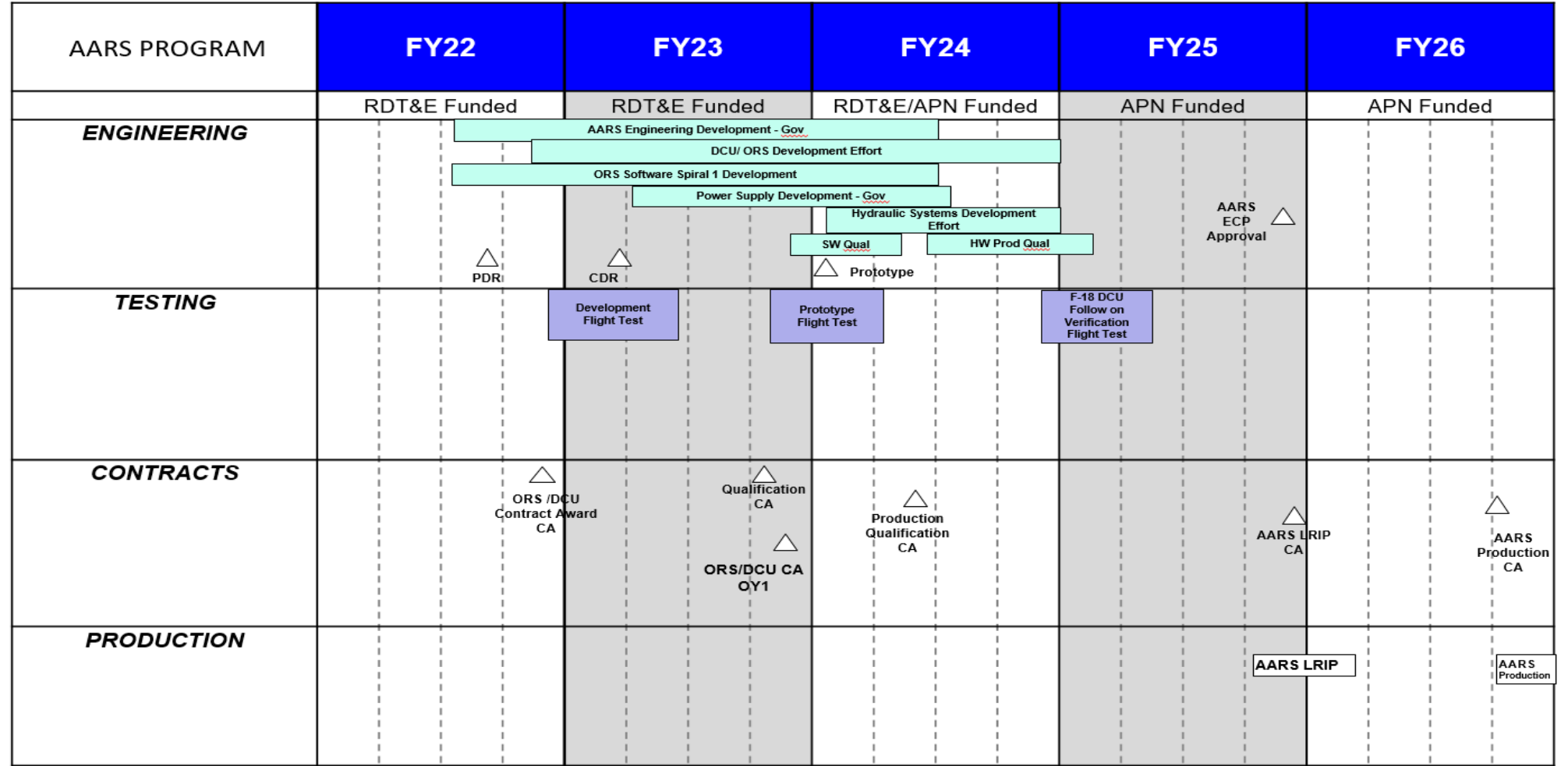
C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024 Base</u>	<u>FY 2024 OCO</u>	<u>FY 2024 Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• APN/0720: <i>War Consumables</i>	42.431	40.316	44.632	-	44.632	48.109	52.662	53.814	55.038	Continuing	Continuing
Remarks											
D. Acquisition Strategy The Advanced Aerial Refueling Store (AARS) development program will mature and integrate modifications to improve the existing Aerial Refueling Store (ARS). The Advanced Aerial Refueling Store (AARS) program will develop, prototype and test the next generation Aerial Refueling Store (ARS) utilizing a hybrid program structure to capitalize on existing technologies that can be incorporated into the existing ARS to improve reliability and readiness while also increasing safety during refueling. The AARS technologies will be fielded as a series of individual modifications to the ARS. The ARS improvement program will center on the Digital Controller Upgrade (DCU). The DCU utilizes government owned software and hardware to command and control the refueling store. The remainder of the AARS upgrades will be built around this government owned DCU. Based on current technology assessments, the program anticipates incorporating an Optical Reference System into the DCU to improve performance and reduce risk during refueling. Additional technologies that will be evaluated include drogue stabilization sensors, positioning, improved health and diagnostics and real time receiver situational awareness for unmanned mission operators. The program will use regular technical interchanges to coordinate with F/A-18 and MQ-25 platforms to maximize effectiveness of the technology upgrades across both manned and unmanned environments.											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program					Project (Number/Name) 3409 / Advanced Aerial Refueling Store				
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Digital Controller Upgrade Dev & Int	SS/CPFF	CTSi : Lakehurst, NJ	0.000	3.000	Jul 2022	2.455	Apr 2023	0.458	Apr 2024	-		0.458	0.000	5.913	5.913
Government Systems Engineering	WR	NAWCAD : Patuxent River, MD	0.000	0.608	Apr 2022	1.500	Jan 2023	0.300	Nov 2023	-		0.300	0.000	2.408	-
Hydraulic System Improvements Developmen	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		0.458	Nov 2023	-		0.458	0.000	0.458	-
Drogue Stabilization Development	SS/CPFF	AMA : Lakehurst, NJ	0.000	1.000	Jun 2022	1.750	Apr 2023	0.000		-		0.000	0.000	2.750	2.750
Flight Test OTA	TBD	TBD : Patuxent River, MD	0.000	0.000		0.000		0.800	Feb 2024	-		0.800	0.000	0.800	-
Subtotal			0.000	4.608		5.705		2.016		-		2.016	0.000	12.329	N/A
Remarks															
Hydraulic system improvement was delayed to FY 2024 due to the higher priority efforts of the DCU upgrades requiring the FY 2023 funds.															
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NAWCAD Pax : Patuxent River, MD	0.000	0.000		1.000	Apr 2023	0.200	Nov 2023	-		0.200	0.000	1.200	-
Subtotal			0.000	0.000		1.000		0.200		-		0.200	0.000	1.200	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	4.608		6.705		2.216		-		2.216	0.000	13.529	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program		Project (Number/Name) 3409 / Advanced Aerial Refueling Store	



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0604659N / Precision Strike Weapons Development Program

Project (Number/Name)

3409 / Advanced Aerial Refueling Store

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3409				
AARS Development: AARS Engineering Development - Gov	3	2022	3	2024
AARS Development: DCU/ORS Development Effort	4	2022	4	2024
AARS Development: ORS Software Spiral 1 Development	3	2022	3	2024
AARS Development: Power Supply Development - Gov	2	2023	3	2024
AARS Development: Hydraulic System Upgrade Development Effort	1	2024	4	2024
AARS Development: Software Qualification	4	2023	2	2024
AARS Development: Hardware Production Qualification	2	2024	1	2025
AARS Development: PDR	3	2022	3	2022
AARS Development: CDR	1	2023	1	2023
AARS Development: Prototype	1	2024	1	2024
AARS Development: AARS ECP Approval	4	2025	4	2025
Testing: Development Flight Test	4	2022	2	2023
Testing: Prototype Flight Test Validation	4	2023	2	2024
Testing: F-18 DCU Follow Verification Flight Test	4	2024	2	2025
Contracts: DCU/ORS Contract Award	4	2022	4	2022
Contracts: DCU/ORS Contract Award OY1	4	2023	4	2023
Contracts: Qualification Contract Award	4	2023	4	2023
Contracts: Production Qualification Contract Award	2	2024	2	2024
Contracts: AARS LRIP CA	4	2025	4	2025
Contracts: AARS Production CA	4	2026	4	2026

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program				Project (Number/Name) 3411 / CAD/PAD Digital Twin Modeling			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3411: CAD/PAD Digital Twin Modeling	0.769	0.744	0.351	0.828	-	0.828	0.553	0.439	0.446	0.455	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Cartridge Actuated Devices/ Propellant Actuated Devices (CAD/PAD) Digital Twin Modeling will develop and validate models and algorithms for the Department of the Navy (DoN). Digital Twin is a software model that predicts service life of a components' energetic material. This will be used to move towards a Condition Based Maintenance Model vice restrictive service life. The development will be phased over three efforts, specific to Navy AirCrew Common Ejection Seats (NACES). These models will be used as a starting point for a condition based service life for CAD/PAD. A condition based service life will result in long term cost savings for the DoN by enabling CAD/PAD to be installed for full useful service life. These models will also be used to support initial service life decisions, service life extension decisions, and address obsolescence.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: CAD/PAD Digital Twin Modeling	0.744	0.351	0.828	0.000	0.828
Articles:	-	-	-	-	-
FY 2023 Plans: Continue to develop software and integrating digital twin model into additional Navy or tri-service aviation platforms.					
FY 2024 Base Plans: Software security compliance tests will be conducted to ensure developed software meets software security and DOD cloud cyber security requirements. The tests will be conducted in FY 2024 during the software integration phase.					
FY 2024 OCO Plans: N/A					
FY 2023 to FY 2024 Increase/Decrease Statement: Funding increase in FY 2024 due to the start of software security compliance testing.					
Accomplishments/Planned Programs Subtotals	0.744	0.351	0.828	0.000	0.828

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy							Date: March 2023	
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0604659N / <i>Precision Strike Weapons Development Program</i>			Project (Number/Name) 3411 / <i>CAD/PAD Digital Twin Modeling</i>	

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u> <u>Base</u>	<u>FY 2024</u> <u>OCO</u>	<u>FY 2024</u> <u>Total</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>FY 2028</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• PANMC/0180: CARTRIDGE ACTUATED DEVICES/ PROPELLANT ACT DEVICES	68.387	71.391	72.426	-	72.426	73.969	75.354	76.947	79.222	Continuing	Continuing

Remarks

The software development for CAD/PAD products to support inventory objectives by transitioning to condition based maintenance. Recent investigations into life cycle cost savings, safety mitigation and reliability of products indicate that a substantial costs savings could be realized, address obsolescence, as well as improve readiness.

D. Acquisition Strategy

Culmen International, LLC has a proven methodology to develop computer models (digital twin) relevant to the thermal loading CAD/PAD items are subjected to. A contract will be awarded to Culmen International, LLC to develop a digital twin using their proprietary software, Tru Navigator. The Tru Navigator software will use as its input, key areas of degradation to CAD/PAD items (temperature, humidity, shock, vibration and thermal cycling) and its output will be the cumulative degradation to the CAD/PAD item. Additional technologies and associated vendors will also be evaluated as necessary.

All other efforts; procurement of CAD/PAD test items, test and evaluation, and model validation will be sourced using competitive contracting strategies.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program						Project (Number/Name) 3411 / CAD/PAD Digital Twin Modeling			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	SS/CPiF	Culmen International : Alexandria, VA	0.469	0.659	Jul 2022	0.267	Jun 2023	0.742	Jan 2024	-		0.742	Continuing	Continuing	Continuing
Subtotal			0.469	0.659		0.267		0.742		-		0.742	Continuing	Continuing	N/A
Remarks															
FY 2024 Phase IV contract supports compliance test efforts to support the software integration phase of the Digital Twin Modeling.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Support	WR	NSWC : Indian Head	0.300	0.085	Mar 2022	0.084	Feb 2023	0.086	Dec 2023	-		0.086	Continuing	Continuing	Continuing
Subtotal			0.300	0.085		0.084		0.086		-		0.086	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.769	0.744		0.351		0.828		-		0.828	Continuing	Continuing	N/A
Remarks															

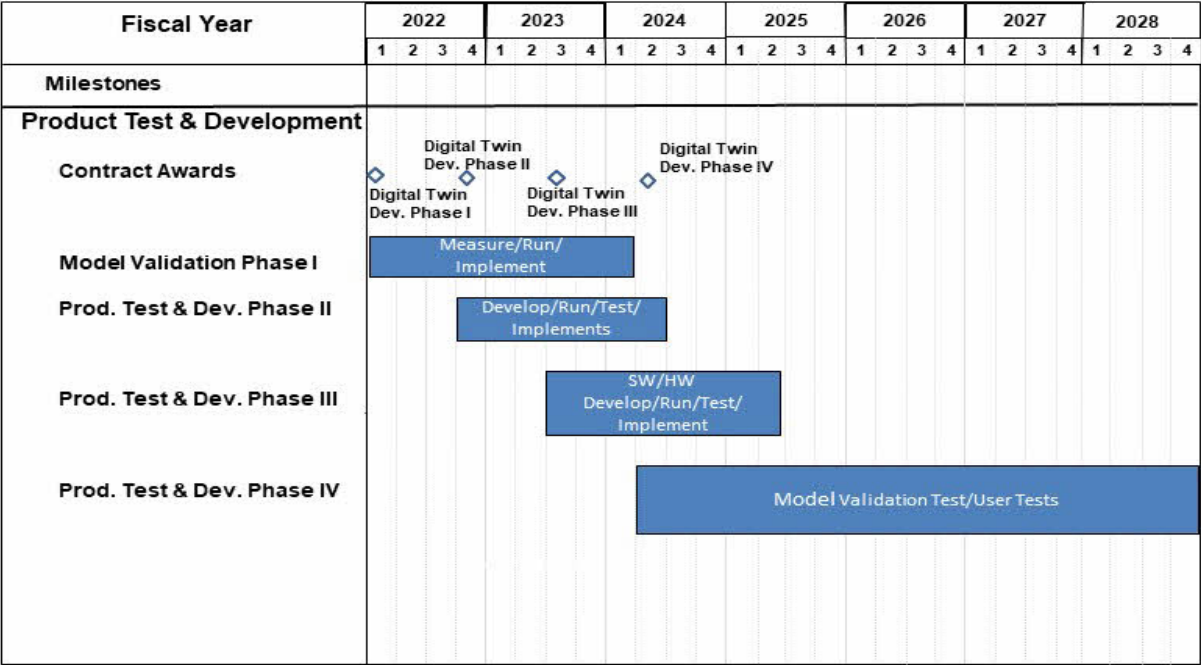
Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program		Project (Number/Name) 3411 / CAD/PAD Digital Twin Modeling	



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CADPAD PROGRAM SCHEDULE PB24



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604659N / <i>Precision Strike Weapons Development Program</i>	Project (Number/Name) 3411 / <i>CAD/PAD Digital Twin Modeling</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>CAD/PAD Digital Twin Modeling</i>				
Product Development: Contract Awards: FY 2022 Culmen International Contract Award (Phase I)	1	2022	1	2022
Product Development: Contract Awards: FY 2022 Culmen International Contract Award (Phase II)	4	2022	4	2022
Product Development: Contract Awards: FY 2023 Culmen International Contract Award (Phase III)	3	2023	3	2023
Product Development: Contract Awards: FY 2024 Culmen International Contract Award (Phase IV)	2	2024	2	2024
Product Development: Model Validation Phase I: Model Validation Phase I	1	2022	1	2024
Product Development: Product Test and Development Phase II: Product Test and Development Phase II	4	2022	2	2024
Product Development: Product Test and Development Phase III: Product Test and Development Phase III	3	2023	2	2025
Product Development: Product Test and Development Phase IV: Product Test and Development Phase IV	2	2024	4	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program				Project (Number/Name) 3467 / Sea Launched Cruise Missile Nuclear			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3467: Sea Launched Cruise Missile Nuclear	0.000	5.033	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.033
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project will design, develop, produce and deploy a Nuclear-Armed Sea-Launched Cruise Missile (SLCM-N). SLCM-N is scoped to deliver an integrated flight system and to continue to advance SLCM-N capabilities to fully address requirements identified in the 2018 Nuclear Posture Review, SLCM-N Initial Capabilities Document, and examined in the Analysis of Alternatives to mitigate a lack of a sea based tactical nuclear based system.

The major activities in the SLCM-N program include 1) Flight System (FS); 2) Weapon System Command and Control (WSC2); 3) Infrastructure [e.g. Launch Vessel (LV) and Launch Control Centers (LCC)]; 4) Weapon System Integration. Flight System is an integrated system which includes the following major subcomponents: propulsion, guidance, and warhead systems. WSC2 encompasses all weapon system Command and Control (C2) components and interfaces, associated shipboard hardware, shipboard fire control equipment and associated software directly related to the sustainment, survivability, monitoring and launch of the flight system. Infrastructure includes modernization of launch vessels, real property and structures, and associated ground mechanical systems. The SLCM-N program will include development of applicable support equipment, data, flight test hardware and infrastructure, and training material.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: SLCM-N	5.033	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2023 Plans: N/A					
FY 2024 Base Plans: N/A					
FY 2024 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	5.033	0.000	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program	Project (Number/Name) 3467 / Sea Launched Cruise Missile Nuclear

C. Other Program Funding Summary (\$ in Millions)

Remarks

D. Acquisition Strategy

The SLCM-N program will deliver a weapon system capability that meets Navy requirements. For the pre-Milestone A and Technology Maturation/Risk Reduction (TMRR) phases of this strategy, contracts will be competitively awarded. The TMRR phase will include a System Requirements Review (SRR), a System Design Review (SDR) and will culminate in a system Preliminary Design Review (PDR). As appropriate, the contract will include risk reduction prototyping on key technologies and the requirement to bring forward multiple vendor designs for key government designated components/sub-components to PDR or beyond. After MS B approval, Engineering, Manufacturing and Development (EMD) contract will be competitively awarded.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program						Project (Number/Name) 3467 / Sea Launched Cruise Missile Nuclear			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SCLM-N	TBD	TBD : TBD	0.000	5.033	May 2022	0.000		0.000		-		0.000	0.000	5.033	-
Subtotal			0.000	5.033		0.000		0.000		-		0.000	0.000	5.033	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	5.033		0.000		0.000		-		0.000	0.000	5.033	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy										Date: March 2023																															
Appropriation/Budget Activity 1319 / 4										R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program										Project (Number/Name) 3467 / Sea Launched Cruise Missile Nuclear																					
Proj 3467										FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028							
										1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
SLCM-N Development																																									
																														</											

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program	Project (Number/Name) 3467 / Sea Launched Cruise Missile Nuclear

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3467				
SLCM-N Development: SLCM-N Continuous Development	4	2022	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program				Project (Number/Name) 9999 / Congressional Adds			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: Congressional Adds	0.000	5.792	25.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	30.792
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

C762 - NEUTRON RADIOGRAPHY TECHNOLOGIES FOR ENERGETIC DEVICES

Neutron radiography (N-ray) is a critical nondestructive inspection technique used to complement X-ray. N-ray and X-ray are used to detect defects and proper assembly of a variety of energetics, including Cartridge and Propellant Actuated Devices (CAD/PADs). The US Navy intends to continue to employ neutron radiographic inspection to support energetics programs for the foreseeable future. Historically, nuclear reactors have been the only sources to perform high quality, high throughput neutron radiography. The energetics supply chain has been heavily reliant on a single commercial nuclear reactor that has been operating since the 1950s with closure imminent. This congressional add allows research and development to provide a site survey and preparatory improvement of facilities to support a high energy ion accelerator capability.

*PHASE I of N-Ray Congressional Add is located under PE: 0605518N CONVENTIONAL PROMPT STRIKE (CPS).

C880: SLCM-N

This project will conduct system development and demonstration of nuclear-capable sea-launched cruise missile.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2022	FY 2023
Congressional Add: Neutron radiography technologies for energetic devices	5.792	0.000
FY 2022 Accomplishments: Congressional Add for Neutron radiographic inspection of cartridge and propellant. Funding was realigned to NAVAIR as they were the intended recipient of the Congressional Add.		
FY 2023 Plans: N/A		
Congressional Add: SLCM-N	0.000	25.000
FY 2022 Accomplishments: N/A		
FY 2023 Plans: Congressional add for Nuclear-Capable Sea-Launched Cruise Missile (SLCM-N). Funds will be used to refine SLCM-N parameters to enable any future acquisition decision. Conduct SLCM-N technology development and conduct SLCM-N systems engineering and technical evaluation efforts.		
Congressional Adds Subtotals	5.792	25.000

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program	Project (Number/Name) 9999 / Congressional Adds

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

CAD/PAD JPO and NSWC IHD are performing site and facility assessments, developing requirements, and performing a safety analyses for an accelerator-based neutron radiography capability to be located at NSWC IHD other partner location.

In parallel to the government work above, a contract is planned to award for engineering support to perform modeling and safety analyses to ensure the system is safe to operate in the Navy facility, as well as assist the Navy with any regulatory submittals required to own and operate the system. System component hardware procurement will be phased in once requirements are defined.

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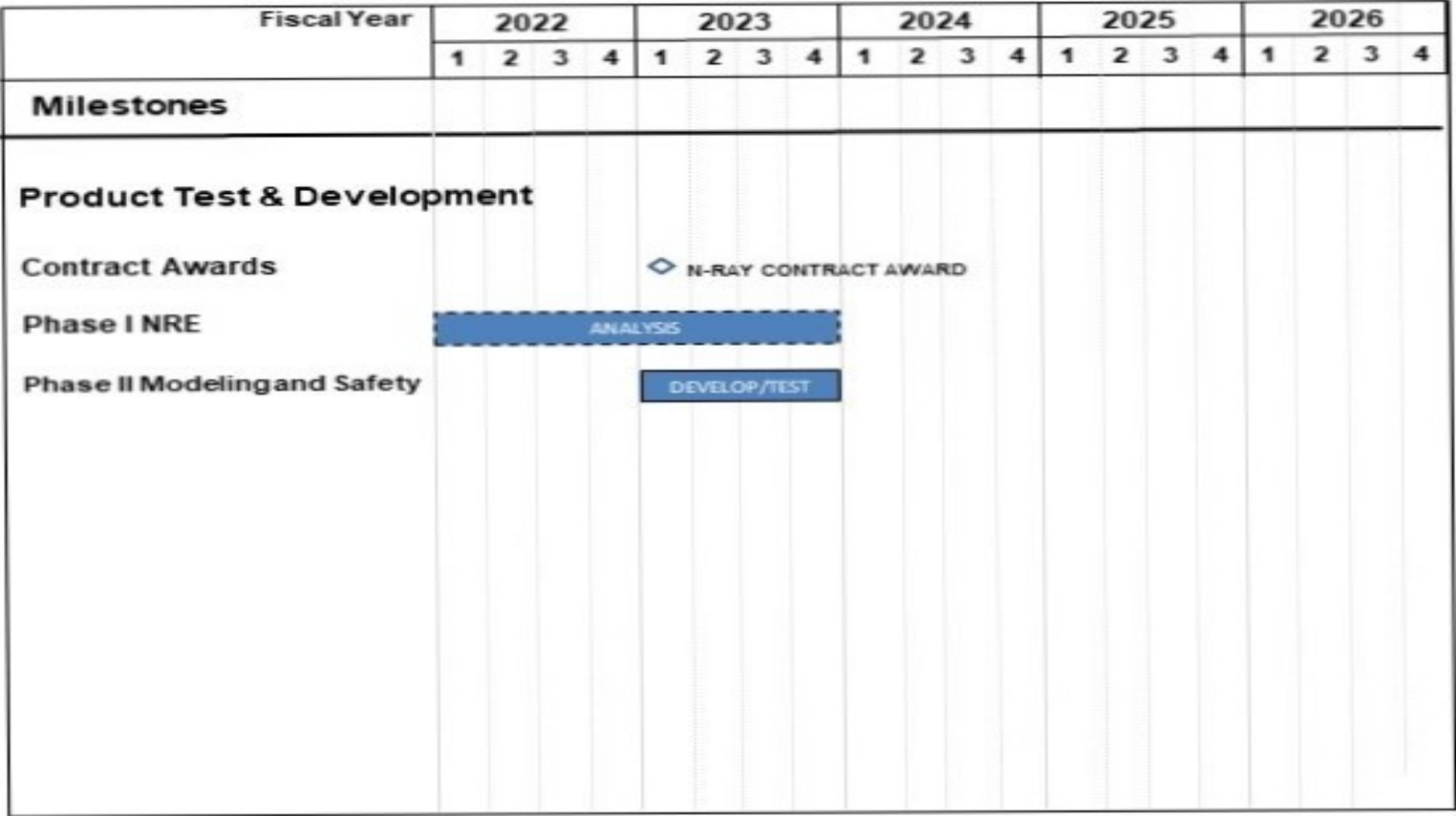
Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program					Project (Number/Name) 9999 / Congressional Adds				
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Phase II Product Dev	WR	NSWC : Indian Head	0.000	3.177	Jul 2022	0.000		0.000		-		0.000	0.000	3.177	-
Phase II Product Dev	TBD	Pheonix, LLC : Wisconsin	0.000	2.600	Oct 2022	0.000		0.000		-		0.000	0.000	2.600	2.600
Subtotal			0.000	5.777		0.000		0.000		-		0.000	0.000	5.777	N/A
Remarks FY 2022 Congressional Add for Neutron radiographic inspection of cartridge and propellant.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Phase II NAWCWD Support	WR	NAWCWD : CHINA LAKE	0.000	0.015	Aug 2022	0.000		0.000		-		0.000	0.000	0.015	-
Subtotal			0.000	0.015		0.000		0.000		-		0.000	0.000	0.015	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	C/CPFF	JHU/APL : BALTIMORE, MD	0.000	0.000		2.500	Oct 2023	0.000		-		0.000	0.000	2.500	-
Developmental Test & Evaluation (DT&E)	C/CPFF	TBD1 : TBD	0.000	0.000		8.000	Oct 2023	0.000		-		0.000	0.000	8.000	-
Developmental Test & Evaluation (DT&E)	C/CPFF	TBD2 : TBD	0.000	0.000		8.000	Oct 2023	0.000		-		0.000	0.000	8.000	-
Developmental Test & Evaluation (DT&E)	C/CPFF	TBD3 : TBD	0.000	0.000		4.000	Oct 2023	0.000		-		0.000	0.000	4.000	-
Developmental Test & Evaluation (DT&E)	C/CPFF	TBD4 : TBD	0.000	0.000		2.500	Oct 2023	0.000		-		0.000	0.000	2.500	-
Subtotal			0.000	0.000		25.000		0.000		-		0.000	0.000	25.000	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program					Project (Number/Name) 9999 / Congressional Adds					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks FY 2023 Congressional Add for Nuclear-Armed Sea-Launched Cruise Missile (SLCM-N)															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	5.792		25.000		0.000		-		0.000	0.000	30.792	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program		Project (Number/Name) 9999 / Congressional Adds	



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PE 0604659N: *Precision Strike Weapons Development Pro...*
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Project (Number/Name)	9999 / Congressional Adds

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program	Project (Number/Name) 9999 / Congressional Adds	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
CAD/PAD N-RAYPage/Group/Row				
Product Development: Contract Awards: PHEONIX, LLC CONTRACT	1	2023	1	2023
Product Development: PHASE I NRE: Analysis	1	2022	4	2023
Product Development: PHASE II MODEL SAFETY: PHASE II MODEL SAFETY	1	2023	4	2023
SLCM-N				
SLCM-N System Development: SLCM-N System Development	1	2023	4	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0604707N / SEW Architecture/Eng Support							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	51.396	8.980	10.229	9.993	-	9.993	10.039	10.219	10.381	10.589	Continuing	Continuing
2356: Maritime Concept Generation & Development	51.396	8.980	10.229	9.993	-	9.993	10.039	10.219	10.381	10.589	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Maritime Concept Generation & Development (MCGD) project focuses on the generation, development and validation of warfighting concepts, Concept of Operations (CONOPS) and doctrine in order to eliminate war fighting gaps. Naval Warfare Development Command (NWDC) also manages the Fleet Experimentation program (formerly Sea Trial). The FY24 project will execute new experimentations in the areas of Electromagnetic Maneuver Warfare (EMW), Mine Warfare, Naval Integrated Fires, and Unmanned systems and conduct experiments (war simulations, Modeling & Simulation (M&S), at-sea events) to develop emerging Naval concepts.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	9.340	10.229	9.984	-	9.984
Current President's Budget	8.980	10.229	9.993	-	9.993
Total Adjustments	-0.360	0.000	0.009	-	0.009
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.360	0.000			
• Program Adjustments	0.000	0.000	-0.041	-	-0.041
• Rate/Misc Adjustments	0.000	0.000	0.050	-	0.050

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604707N / SEW Architecture/Eng Support				Project (Number/Name) 2356 / Maritime Concept Generation & Development			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2356: Maritime Concept Generation & Development	51.396	8.980	10.229	9.993	-	9.993	10.039	10.219	10.381	10.589	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Maritime Concept Generation and Development (MCGD) funding provides naval warfare subject matter expertise, experiment planning expertise, Modeling and Simulation (M&S) support, and analysis expertise to execute fleet experiments (and the individual experiment initiatives contained within) focused on critical warfighting capabilities and the development of Distributed Military Operations and other emerging Naval concepts.

Typical deliverables for each experimental effort include:

- Experiment control plan
- Data Collection and Analysis Plan (DCAP)
- Experiment Analysis Summary Reference Document
- Experiment Engineering Plan
- Final Experiment Report (with Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities - Policy (DOTMLPF-P) recommendations)
- New/refined doctrine/Tactics, Techniques and Procedures (TTP).

The MCGD project funds four main efforts:

- (1) Provides critical concept development and experimentation manpower, and warfighting subject matter expertise aligned with the Concept Generation/Concept Development (CG/CD) program. The priorities for the CG/CD program are to develop concept/concept of operations and explore near/far-term technological and non-technological solutions to war fighting gaps across all naval warfare areas. The associated experimentation efforts include planning, systems engineering and integration, modeling and simulation support, event execution, data collection, analysis, and assessment for a wide-range of experimentation efforts including the examination of prototypes, tactical development and evaluation, support for Science and Technology (S&T) innovation, and program of record system development; venues such as workshops, seminars, war games, limited objective experiments, limited technical experiments, and live at-sea events are used to execute these experimentation efforts.
- (2) Provides naval warfare subject matter expertise, experiment planning expertise, and analysis expertise to plan, execute, and assess experimentation for the fleets and warfighting development centers (WDC) at the operational and tactical levels. This includes a focus on WDC integration role, maritime command and control (C2), advanced cross-domain warfighting, and maritime operations centers (MOCS)/operational level of war (OLW) lines of operations. Seeks to solve fleet-identified warfighting gaps (referenced within the Integrated Prioritized Capability Lists (IPCL), Urgent Operational Needs Statements (UONS), Fleet Commander's Guidance, etc.). The experimentation and prototyping efforts support the "last tactical mile" of many Navy S&T programs by supporting those programs where the technology is mature enough, but requires evaluation on or by a "fleet asset" - ships, airplanes, submarines, and sailors.
- (3) Provides Modeling and Simulation (M&S) support to Navy experimentation efforts. M&S is used to stimulate decision making during seminar-style and system war gaming experiments and provides the simulated operational environment and capabilities with high-fidelity models such as the Joint Semi-Automated Force (JSAF) program. Additionally, where

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604707N / SEW Architecture/Eng Sup port	Project (Number/Name) 2356 / Maritime Concept Generation & Development				
applicable, the Navy Simulation System (NSS) "Monte Carlo" model is also used to give high confidence solutions and outcomes to complex warfighting problems. (4) Develops focused, solution-driven tactics and evaluation through experimentation. This effort is focused on developing near-term doctrine solutions to address specific fleet-identified tactical issues. Maritime Concept Generation and Concept Development products include: - Concepts (signed by the Chief of Naval Operations (CNO) that influence future funding and technological development) - Enabling concepts - Concepts of Operations (CONOPS) - Final experimentation reports, to include findings, insights, and recommendations and Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities - Policy (DOTMLPF-P) change recommendations and plans for action - Experiment Analysis Summary Reference Documents - New/revised doctrinal and Tactics/Techniques/Procedures publications - White papers (think pieces) intended to generate further discussion within Navy leadership Specific products are listed in the Accomplishments/Plans section of this exhibit.						
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Maritime Concept Generation and Development		8.980	10.229	9.993	0.000	9.993
Articles:		-	-	-	-	-
FY 2023 Plans: Critical MCGD-resourced analytical and naval warfare subject matter expertise will design FY23 experiments to follow up on findings from FY 21-22 experiments and focus on materiel and non-materiel solutions using appropriate experimentation venues including workshops, at-sea events, and war simulations. Experimentation efforts in FY23 are expected to continue to directly support multiple strategic capability development efforts (including CNO's Unmanned Systems Campaign and CNO's Navigation Plan capability objectives) and align to the following Fleet Commander's priorities: Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance, and Reconnaissance (C5ISR) Experiments will explore technologies and associated TTP that support development of a robust and secure network infrastructure to link distributed forces together and a resilient web of persistent sensors, command and control nodes, platforms, and weapons. MARITIME FIRES						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604707N / SEW Architecture/Eng Support		Project (Number/Name) 2356 / Maritime Concept Generation & Development		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Experiments will support multiple efforts across the Navy, Marine Corps, and Joint force to enhance capabilities to project synchronized lethal and non-lethal effects across all domains and provide persistent, all-domain, long-range precision fires, supported by agile, resilient, integrated networks.</p> <p>COUNTER-INTELLIGENCE, SURVEILLANCE, AND RECONNAISSANCE (ISR)</p> <p>Experiments will support efforts to increase naval forces ability to avoid detection by adversary ISR systems in order to establish, maintain, and exploit sea control in contested environments.</p> <p>FY 2024 Base Plans:</p> <p>Critical MCGD analytical and subject matter expertise support for FY24 experiments and focus on materiel and non-materiel solutions using appropriate experimentation venues including workshops, at-sea events, and war simulations. Experimentation efforts in FY24 will support multiple strategic capability development efforts (including CNO's Unmanned Systems Campaign) and will align to the following Fleet Commander's focus areas:</p> <p>Continue Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance, and Reconnaissance (C5ISR) Experiments that will explore technologies and associated TTP that support development of a robust and secure network infrastructure to link distributed forces together and a resilient web of persistent sensors, command and control nodes, platforms, and weapons.</p> <p>Continue Maritime Fires Experiments that will support multiple efforts across the Navy, Marine Corps, and Joint force to enhance capabilities to project synchronized lethal and non-lethal effects across all domains and provide persistent, all-domain, long-range precision fires, supported by agile, resilient, integrated networks.</p> <p>Continue Counter- Intelligence, Surveillance, and Reconnaissance Experiments that will support efforts to increase naval forces ability to avoid detection by adversary ISR systems in order to establish, maintain, and exploit sea control in contested environments</p> <p>FY 2024 OCO Plans:</p> <p>N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p> <p>The decrease of \$0.245M between FY23 and FY24 is due to a decrease in the number of experiments that will be conducted to support multiple efforts.</p>						
Accomplishments/Planned Programs Subtotals		8.980	10.229	9.993	0.000	9.993

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604707N / SEW Architecture/Eng Sup port	Project (Number/Name) 2356 / Maritime Concept Generation & Development
C. Other Program Funding Summary (\$ in Millions) N/A		
<u>Remarks</u>		
D. Acquisition Strategy This funding is used to acquire intellectual capital in emerging conceptual and technical areas through contracts providing expertise in concepts and experiment design, execution and analysis to mitigate fleet-identified current and future warfighting gaps.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy **Date:** March 2023

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604707N / SEW Architecture/Eng Sup port	Project (Number/Name) 2356 / Maritime Concept Generation & Development
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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	C/CPFF	Defense Technical Information Center : Ft Belvoir VA	25.440	4.036	Dec 2021	4.529	Dec 2022	4.333	Dec 2023	-		4.333	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	Various	NIWC Atlantic : Charleston, SC	2.734	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	Various	ONR : Washington, DC	1.370	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	Various	NAVSEA : Washington, DC	1.334	0.000		0.000		0.000		-		0.000	0.000	1.334	-
Developmental Test & Evaluation (DT&E)	PO	Naval Underwater Warfare Center : Newport RI	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	-
Developmental Test & Evaluation (DT&E)	C/CPFF	NAVSUP : Norfolk VA	17.154	4.944	Feb 2022	5.700	Feb 2023	5.660	Feb 2024	-		5.660	0.000	33.458	-
Developmental Test & Evaluation (DT&E)	IA	Center for Naval Analysis : Norfolk, VA	0.154	0.000		0.000		0.000		-		0.000	0.000	0.154	-
Subtotal			48.686	8.980		10.229		9.993		-		9.993	Continuing	Continuing	N/A

Remarks

The vast majority of the contract costs are for contract labor, primarily on two large multi-award contracts (MAC), one through Defense Technical Information Center (DTIC) MAC and one through Joint Staff J-7 MAC. Task orders on the DTIC MAC provide the majority of the Modeling & Simulation support for experimentation and some of the experiment planner support. Task orders on the JS J-7 MAC provide the majority of the experiment design, planner, and execution support.

Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	C/FFP	Navy Warfare Development Command : Norfolk, VA	2.710	0.000		0.000		0.000		-		0.000	0.000	2.710	-
Subtotal			2.710	0.000		0.000		0.000		-		0.000	0.000	2.710	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023						
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604707N / SEW Architecture/Eng Sup port					Project (Number/Name) 2356 / Maritime Concept Generation & Development							
					Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals					51.396	8.980		10.229		9.993		-		9.993	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																Date: March 2023									
Appropriation/Budget Activity 1319 / 4										R-1 Program Element (Number/Name) PE 0604707N / SEW Architecture/Eng Sup port								Project (Number/Name) 2356 / Maritime Concept Generation & Development							

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																Date: March 2023												
Appropriation/Budget Activity 1319 / 4										R-1 Program Element (Number/Name) PE 0604707N / SEW Architecture/Eng Sup port								Project (Number/Name) 2356 / Maritime Concept Generation & Development										
	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Experimentation Efforts: FLEX in IMX																												
Experimentation Efforts: Premonition TTX																												
Experimentation Efforts: FARP TTX																												
Experimentation Efforts: FLEX in Atlantic Thunder																												
Experimentation Efforts: FLEX in BALTOPS																												
Experimentation Efforts: FLEX in Valiant Shield																												
Experimentation Efforts: REDCAT TTX																												
Experimentation Efforts: FLEX in RIMPAC																												
Experimentation Efforts: FLEX in SCARLET DRAGON																												
Experimentation Efforts: Buzzer Beater LOE																												
Experimentation Efforts: Naval Tactical Grid Enablers																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604707N / SEW Architecture/Eng Sup port	Project (Number/Name) 2356 / Maritime Concept Generation & Development	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2356				
Maritime Concept Generation and Development Efforts: Emergent Concepts and Enabling Concepts	1	2022	4	2026
Maritime Concept Generation and Development Efforts: Develop Distributed Maritime Operations Concept / Enabling Concepts	1	2022	4	2026
Maritime Concept Generation and Development Efforts: Operational Logistics in support of DMO Concept	1	2022	4	2023
Maritime Concept Generation and Development Efforts: Naval and SOF Operations Concept	1	2022	4	2023
Experimentation Efforts: Counter Intelligence, Surveillance, Reconnaissance Experiment Series	1	2022	1	2027
Experimentation Efforts: Naval Operational Architecture Experiment Series	1	2022	1	2027
Experimentation Efforts: Maritime Fires Experiment Series	1	2022	1	2027
Experimentation Efforts: Deception CONOPS TTX	1	2022	1	2023
Experimentation Efforts: NSW Support to Lethality LOE	1	2022	4	2023
Experimentation Efforts: FLEX in FBPs	1	2022	1	2027
Experimentation Efforts: FLEX in Steel Knight	1	2022	1	2023
Experimentation Efforts: FLEX in ATE	1	2022	1	2023
Experimentation Efforts: FLEX in IMX	1	2022	1	2023
Experimentation Efforts: Premonition TTX	1	2022	1	2023
Experimentation Efforts: FARP TTX	1	2022	1	2023
Experimentation Efforts: FLEX in Atlantic Thunder	1	2022	1	2023
Experimentation Efforts: FLEX in BALTOPS	1	2022	1	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604707N / SEW Architecture/Eng Sup port	Project (Number/Name) 2356 / Maritime Concept Generation & Development		
	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
Experimentation Efforts: FLEX in Valiant Shield	1	2022	1	2023
Experimentation Efforts: REDCAT TTX	1	2022	1	2023
Experimentation Efforts: FLEX in RIMPAC	1	2022	1	2023
Experimentation Efforts: FLEX in SCARLET DRAGON	1	2022	1	2023
Experimentation Efforts: Buzzer Beater LOE	1	2022	1	2023
Experimentation Efforts: Naval Tactical Grid Enablers	1	2022	1	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy											Date: March 2023	
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0604786N / Offensive Anti-Surface Warfare Weapon Dev							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	1,462.209	75.093	223.826	237.655	-	237.655	284.751	176.521	114.054	98.114	Continuing	Continuing
3337: Offensive Anti-Surface Warfare (OASuW) Weapon	1,462.209	35.751	6.580	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1,504.540
3343: Offensive Anti-Surface Warfare (OASuW) Weapon Increment II	0.000	0.000	151.871	95.797	-	95.797	99.327	83.220	84.517	86.213	Continuing	Continuing
3466: LRASM C-3	0.000	39.342	65.375	141.858	-	141.858	185.424	93.301	29.537	11.901	Continuing	Continuing

A. Mission Description and Budget Item Justification

Offensive Anti-Surface Warfare (OASuW) is an offensive weapon system that is a vital component of the Joint Force Anti-Surface Warfare capability and incorporates new and emergent technologies to support an increased offensive strike capability utilizing multiple weapons. OASuW Increment 2 is a national imperative to maturing hypersonic capabilities. The program will provide the Navy a necessary weapon to address evolving long range high speed threats from near peer competitors. The OASuW program is part of the Navy's Long Range Fires (LRF) approach to address advanced threat capabilities in the Anti-Access/Area-Denial (A2AD) environment. LRF solutions enable individual system capabilities to be leveraged across an effects chain, placing the full spectrum of tactical capability in the hands of the warfighter. LRF solutions that push engagement distances beyond the launch platform's radar horizon and allows the U.S. Navy to operate in, and control, contested battle space in littoral waters and A2/AD environments are increasingly critical as more and more scenarios require compressed and coordinated fire control timelines. OASuW strategy pursues capability across multiple weapon systems to enhance warfighting capabilities.

Project 3343 - The Department of the Navy is developing Offensive Anti-Surface Warfare Increment 2 (OASuW Inc 2), also known as Hypersonic Air-Launched OASuW (HALO), to address weapon system requirements based on the OASuW Analysis of Alternatives (AoA). OASuW Inc 2/HALO will be a carrier-suitable, higher-speed, longer-range, air-launched weapon system providing superior Anti Surface Warfare capabilities. The program is part of the Navy's Long Range Fires investment approach to meet objectives of the National Defense Strategy. As a key component of this strategy, OASuW Inc 2/HALO will address advanced threats from engagement distances that allow the Navy to operate in, and control, contested battle space in littoral waters and Anti-Access/Area Denial (A2/AD) environments. To the maximum extent possible, the Navy will leverage technology being matured in the Science and Technology (S&T) and rapid prototyping arenas to support aggressive schedule execution. The OASuW Inc 2/HALO program will progress through a competitive technical maturation and design development period which will provide the foundation for a sole-source Engineering, Manufacturing and Development contract. Department approved requirements are documented in a Service Level Capability Development Document to be signed by March 2023. In order to counter the evolving near-peer threat capability, OASuW Inc 2/HALO is required to be fielded in FY 2029. PU 3343 is a FY 2023 New Start.

Project 3466 - The LRASM C-3 program is established to improve OASuW and incorporate a long range strike capability into the Navy's arsenal derived from the Navy's AGM-158C-1 LRASM and the Air Force's AGM-158 JASSM-ER. The Navy will integrate an AGM-158 derived weapon onto F/A-18 E/F aircraft. This funding

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0604786N / Offensive Anti-Surface Warfare Weapon Dev				
line resources requirements for Navy increased LRASM capabilities and strike mission integration by upgrading the existing AGM-158C product to respond to rapidly changing threats.						
Project 3337 - Due to emerging threats, the fleet issued an Urgent Operational Needs Statement (UONS) that identified a capability gap for a long-range anti-ship missile to be filled by 2018. Directly supporting this UONS and significantly reducing Joint Force warfighting risks, the U.S. Navy initiated OASuW Increment 1 (OASuW-1), which leverages the Defense Advanced Research Projects Agency (DARPA)/Office of Naval Research Long Range Anti-Ship Missile (LRASM) demonstration program to deliver an Early Operational Capability (EOC) in the required timeframe. LRASM fills the most urgent air-launched capability gap to complement existing ASuW weapon systems and positions the Department of Defense to address evolving surface warfare threats. LRASM is integral to realizing the National Defense Strategy of combat-credible military forces to deter war, protect the security of our nation and to enable the Joint Force to win should deterrence fail. The development and acquisition of LRASM has been structured to be fielded at a pace relevant to maintain overmatch against long-term strategic competition. Specifically, LRASM directly contributes to building a more lethal force and is a critical enabler for joint lethality in contested environments; deterring adversaries from aggression; ensuring common domains remain open and maintaining favorable regional balances of power. The more capable LRASM 1.1 capability improvement efforts conclude with FY 2023 funding.						
Budget Item Justification: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.						
B. Program Change Summary (\$ in Millions)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget		70.792	124.204	98.480	-	98.480
Current President's Budget		75.093	223.826	237.655	-	237.655
Total Adjustments		4.301	99.622	139.175	-	139.175
• Congressional General Reductions		-	-			
• Congressional Directed Reductions		-	-13.959			
• Congressional Rescissions		-	-			
• Congressional Adds		-	113.581			
• Congressional Directed Transfers		-	-			
• Reprogrammings		5.000	0.000			
• SBIR/STTR Transfer		-0.699	0.000			
• Program Adjustments		0.000	0.000	138.000	-	138.000
• Rate/Misc Adjustments		0.000	0.000	1.175	-	1.175
Change Summary Explanation						
Project 3343 Program increase in FY 2024 to support RDT&E shortfall to field initial air-launched hypersonic capability within the FYDP. The following events were deleted from the schedule - SRR, PDR, CDR, and early OA. They were replaced with TR#1, TR#2, TR#3, TR#4, TR#5 to support the MTA/ Rapid Prototyping strategy.						

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604786N / Offensive Anti-Surface Warfare Weapon Dev	
PROJ 3466 program increase in FY 2024 supports the Navy's position to further accelerate the C-3 development efforts to provide Beyond Line of Sight (BLOS), enhanced range and advanced survivability for the LRASM family of weapons.		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604786N / Offensive Anti-Surface Warfare Weapon Dev				Project (Number/Name) 3337 / Offensive Anti-Surface Warfare (OASuW) Weapon			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3337: Offensive Anti-Surface Warfare (OASuW) Weapon	1,462.209	35.751	6.580	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1,504.540
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Offensive Anti-Surface Warfare (OASuW) is an offensive weapon system that can be air, surface, and subsurface launched in the maritime battle space environment. OASuW is a vital component of the Joint Force Anti-Surface Warfare capability and incorporate new and emergent technologies to support an increased offensive strike capability. Due to emerging threats, the fleet issued an Urgent Operational Needs Statement (UONS) that identified a capability gap for a long-range anti-ship missile to be filled by 2018. Directly supporting this UONS and significantly reducing Joint Force warfighting risks, the U.S. Navy initiated OASuW Increment 1 (OASuW-1), which leverages the Defense Advanced Research Projects Agency(DARPA)/Office of Naval Research Long Range Anti-Ship Missile (LRASM) demonstration program to deliver an Early Operational Capability (EOC) in the required timeframe. LRASM fills the most urgent air-launched capability gap to complement existing ASuW weapon systems and positions the Department of Defense to address evolving surface warfare threats. LRASM is integral to realizing the National Defense Strategy of combat-credible military forces to deter war, protect the security of our nation and to enable the Joint Force to win should deterrence fail. The development and acquisition of LRASM has been structured to be fielded at a pace relevant to maintain overmatch against long-term strategic competition. Specifically, LRASM directly contributes to building a more lethal force and is a critical enabler for joint lethality in contested environments; deterring adversaries from aggression; ensuring common domains remain open and maintaining favorable regional balances of power.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: OASuW Development Program	34.761	6.580	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2023 Plans: LRASM 1.1 capability improvements conclude in FY 2023 as the program will be applying Quick Reaction Assessment (QRA) Testing results to a fielding decision for the LRASM 1.1 configuration and progressing to operational test.					
FY 2024 Base Plans: N/A					
FY 2024 OCO Plans: N/A					
FY 2023 to FY 2024 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604786N / <i>Offensive Anti-Surface Warfare Weapon Dev</i>		Project (Number/Name) 3337 / <i>Offensive Anti-Surface Warfare (OASuW) Weapon</i>	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
The OASuW Increment 1 development program concludes with FY 2023 funding upon the completion of LRASM 1.1 capability improvements.						
Title: OASuW Development Program Support		0.990	0.000	0.000	0.000	0.000
Articles:		-	-	-	-	-
FY 2023 Plans: N/A						
FY 2024 Base Plans: N/A						
FY 2024 OCO Plans: N/A						
Accomplishments/Planned Programs Subtotals		35.751	6.580	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• WPN/2291: LRASM	161.212	219.662	639.636	-	639.636	180.439	334.313	406.150	413.359	0.000	2,809.833

Remarks

D. Acquisition Strategy

OASuW-1 is using an accelerated acquisition approach, with streamlined governance to transition the DARPA/ONR-demonstrated Long Range Anti-Ship Missile (LRASM) for use as an air-launched weapon from USAF and USN platforms. LRASM is integral to realizing the National Defense Strategy of combat-credible military forces to deter war, protect the security of our nation and to enable the Joint Force to win should deterrence fail. LRASM supports greater performance of the acquisition system and is demonstrating the delivery of performance at the speed of relevance; organizational structure that supports innovation with a rapid approach that dramatically decreases the timeline from development to fielding. The program is leveraging DoDI 5000.02i Model 4 to structure the acquisition strategy, which includes a highly integrated and concurrent transition design, integration, and developmental / operational test program which successfully met the Early Operation Capability (EOC) fielding threshold required by an Urgent Operational Need Statement (UONS) issued by the fleet. The program is structured in three phases: Technology Maturation, Integration and Test, and Procurement. To manage the accelerated timeline and resulting concurrency, the program uses a structured Knowledge Point review process that support decisions regarding significant program events such as transition from design to integration phase and contract awards. These reviews also provide senior DoD leadership the opportunity to provide focused support and active management of technical and acquisition risk and are chaired by the Service Acquisition Executive, ASN(RDA) (delegated MDA), and the Deputy Director of DARPA. The knowledge points are similar to acquisition milestone reviews, but occur

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604786N / Offensive Anti-Surface Warfare Weapon Dev	Project (Number/Name) 3337 / Offensive Anti-Surface Warfare (OASuW) Weapon
<p>more frequently. Knowledge Point 7 supported Lot 3 procurement and Knowledge Point 8 supported USN EOC decision. The program met the statutory requirements associated with Milestone B at Knowledge Point 3. In addition to the Knowledge Point reviews, the program also conducts Executive Steering Board reviews (also chaired by the MDA). Supporting these reviews, the associated engineering approach is designed to mitigate resulting risk by implementing a rolling-wave engineering progression based on the NAVAIR Systems Engineering Technical Review (SETR) process to enable detailed planning and decisions as the system matures. The LRASM 1.1 capability improvements program, which initiated in FY 2019, follows in the same manner with continued reviews and test events to achieve incorporation of those improvements on future production units.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604786N / <i>Offensive Anti-Surface Warfare Weapon Dev</i>						Project (Number/Name) 3337 / <i>Offensive Anti-Surface Warfare (OASuW) Weapon</i>			
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/CPIF	Lockheed Martin : Orlando, FL	1,030.009	19.806	Apr 2022	1.372	Feb 2023	0.000		-		0.000	0.000	1,051.187	1,051.187
Product Development	C/CPFF	Boeing : St. Louis, MO	63.003	0.000		0.000		0.000		-		0.000	0.000	63.003	63.003
Subtotal			1,093.012	19.806		1.372		0.000		-		0.000	0.000	1,114.190	N/A
Remarks The OASuW Increment 1 development program concludes with FY 2023 funding upon the completion of LRASM 1.1 capability improvements.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Support	WR	NAWC AD : Patuxent River, MD	12.828	0.288	Jan 2022	0.200	Dec 2022	0.000		-		0.000	0.000	13.316	-
Government Support	WR	NAWC WD : China Lake, CA	69.229	3.970	Jan 2022	0.962	Jan 2023	0.000		-		0.000	0.000	74.161	-
Development Support	WR	NSMA : Washington, DC	44.302	2.422	Mar 2022	2.081	Mar 2023	0.000		-		0.000	0.000	48.805	-
Contractor Support	C/CPFF	JHU/APL : Laurel, MD	12.736	0.126	Mar 2022	0.000		0.000		-		0.000	0.000	12.862	12.862
Contractor Support	C/FFP	Gryphon - Schafer Corporation : Arlington, VA	25.938	0.000		0.000		0.000		-		0.000	0.000	25.938	25.938
Mission Planning Support	C/CPFF	Tapestry : San Diego, CA	12.196	0.459	Sep 2022	0.450	Sep 2023	0.000		-		0.000	0.000	13.105	13.105
Contractor Support	C/FFP	SAIC : Patuxent River, MD	2.986	0.025	Mar 2022	0.000		0.000		-		0.000	0.000	3.011	3.011
Contractor Support	Various	Various : Various	15.555	0.376	Nov 2021	0.213	Dec 2022	0.000		-		0.000	0.000	16.144	-
Government Support	Various	Various : Various	7.356	0.253	Jan 2022	0.000		0.000		-		0.000	0.000	7.609	-
Prior Yr Supp no longer funded in the FYDP	Various	Various : Various	2.800	0.000		0.000		0.000		-		0.000	0.000	2.800	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604786N / Offensive Anti-Surface Warfare Weapon Dev				Project (Number/Name) 3337 / Offensive Anti-Surface Warfare (OASuW) Weapon					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support Class	WR	NSMA : Washington, DC	0.000	0.990	Apr 2022	0.000		0.000		-		0.000	0.000	0.990	-
Subtotal			205.926	8.909		3.906		0.000		-		0.000	0.000	218.741	N/A
Remarks The OASuW Increment 1 development program concludes with FY 2023 funding upon the completion of LRASM 1.1 capability improvements.															
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NAWC WD : China Lake, CA	67.714	6.669	Jan 2022	0.992	Apr 2023	0.000		-		0.000	0.000	75.375	-
Developmental Test & Evaluation (DT&E)	WR	NAWC AD : Patuxent River, MD	34.180	0.120	Jan 2022	0.100	Jan 2023	0.000		-		0.000	0.000	34.400	-
Developmental Test & Evaluation (DT&E)	WR	COTF : Norfolk, VA	0.534	0.000		0.000		0.000		-		0.000	0.000	0.534	-
Developmental Test & Evaluation (DT&E)	MIPR	USAF : Various	5.900	0.000		0.000		0.000		-		0.000	0.000	5.900	-
Developmental Test & Evaluation (DT&E)	C/CPFF	NAVSUP : Port Hueneme, CA	0.225	0.000		0.000		0.000		-		0.000	0.000	0.225	0.225
Developmental Test & Evaluation (DT&E)	Various	Various : Various	23.801	0.000		0.000		0.000		-		0.000	0.000	23.801	-
Subtotal			132.354	6.789		1.092		0.000		-		0.000	0.000	140.235	N/A
Remarks The OASuW Increment 1 development program concludes with FY 2023 funding upon the completion of LRASM 1.1 capability improvements.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604786N / Offensive Anti-Surface Warfare Weapon Dev				Project (Number/Name) 3337 / Offensive Anti-Surface Warfare (OASuW) Weapon					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Support	WR	NAWC AD : Patuxent River, MD	13.462	0.000		0.000		0.000		-		0.000	0.000	13.462	-
Government Support	WR	NAWC WD : China Lake, CA	14.228	0.085	Jan 2022	0.075	Nov 2022	0.000		-		0.000	0.000	14.388	-
Project Management Support	C/CPFF	NAWC AD : Patuxent River, MD	1.600	0.083	Jan 2022	0.075	Jan 2023	0.000		-		0.000	0.000	1.758	1.758
Travel	Various	NAWC AD : Patuxent River, MD	1.627	0.079	Oct 2021	0.060	Oct 2022	0.000		-		0.000	0.000	1.766	-
Subtotal			30.917	0.247		0.210		0.000		-		0.000	0.000	31.374	N/A
Remarks															
The OASuW Increment 1 development program concludes with FY 2023 funding upon the completion of LRASM 1.1 capability improvements.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			1,462.209	35.751		6.580		0.000		-		0.000	0.000	1,504.540	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

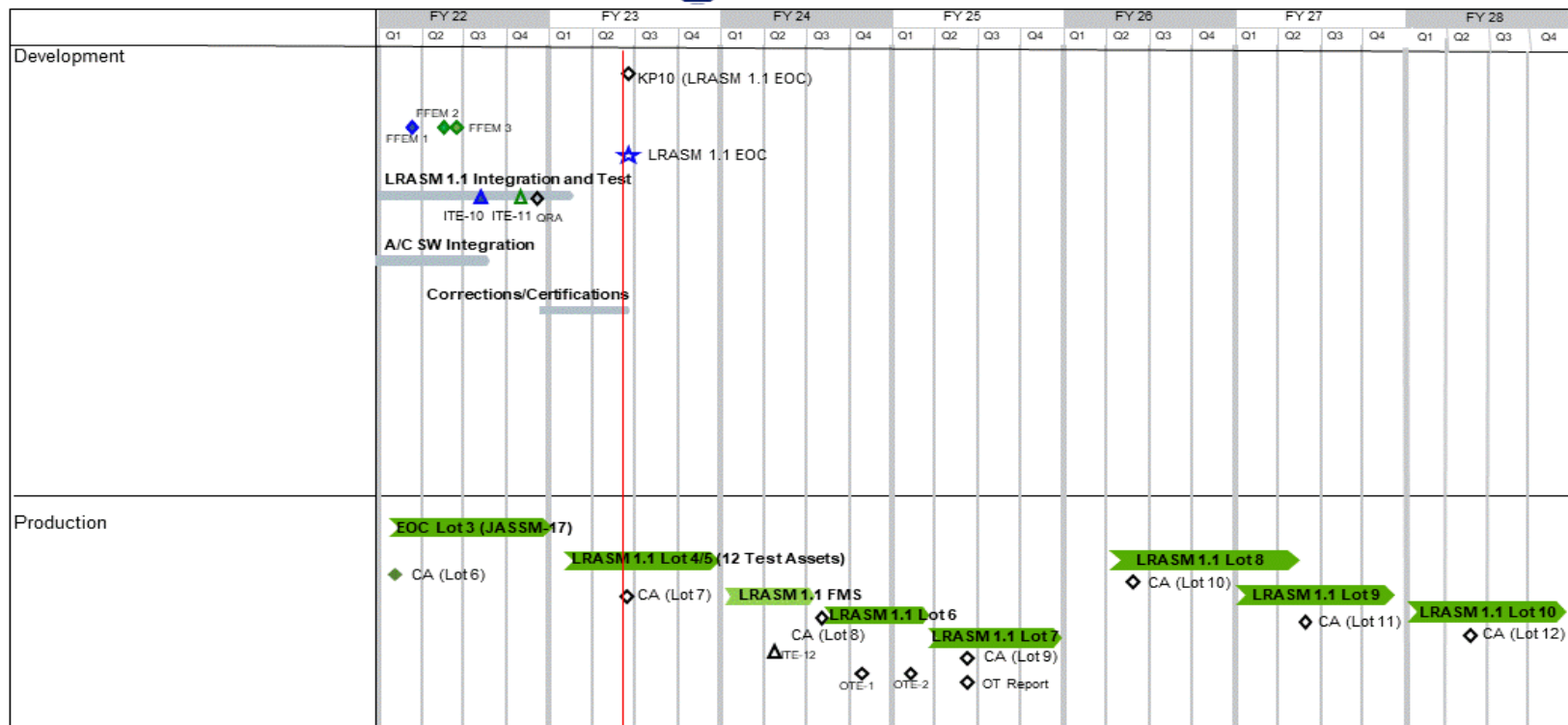
Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0604786N / Offensive Anti-Surface War
fare Weapon Dev

Project (Number/Name)
3337 / Offensive Anti-Surface Warfare
(OASuW) Weapon



OASuW Inc. 1 / LRASM PB24 Program Schedule



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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy											Date: March 2023																	
Appropriation/Budget Activity 1319 / 4											R-1 Program Element (Number/Name) PE 0604786N / Offensive Anti-Surface Warfare Weapon Dev								Project (Number/Name) 3337 / Offensive Anti-Surface Warfare (OASuW) Weapon									
Proj 3337.S41	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Classified support																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0604786N / Offensive Anti-Surface Warfare Weapon Dev

Project (Number/Name)

3337 / Offensive Anti-Surface Warfare (OASuW) Weapon

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Offensive Anti-Surface Weapon (OASuW)				
Development: Knowledge Point 10 (LRASM v1.1)	2	2023	2	2023
Development: Early Operational Capability (LRASM v1.1) Navy	2	2023	2	2023
Development: LRASM 1.1 Integration & Test	1	2022	1	2023
Development: A/C Software Integration	1	2022	3	2022
Development: Free Flight Evaluation Missile (FFEM)-1	1	2022	1	2022
Development: FFEM-2	2	2022	2	2022
Development: FFEM-3	2	2022	2	2022
Development: Integrated Test Event (ITE)-10	3	2022	3	2022
Development: ITE-11	4	2022	4	2022
Development: Quick Reaction Assessment Testing (Navy)	4	2022	4	2022
Development: Corrections / Certifications	4	2022	2	2023
Production: FY 2022 Production Buy - (NAVY) (Lot 6)	1	2022	1	2022
Production: FY 2023 Production Buy - (AF, NAVY) (Lot 7)	2	2023	2	2023
Production: FY 2024 Production Buy - (AF, NAVY) (Lot 8)	3	2024	3	2024
Production: FY 2025 Production Buy - (AF, NAVY) (Lot 9)	2	2025	2	2025
Production: FY 2026 Production Buy - (AF, NAVY) (Lot 10)	2	2026	2	2026
Production: FY 2027 Production Buy - (AF, NAVY) (Lot 11)	2	2027	2	2027
Production: FY 2028 Production Buy - (AF, NAVY) (Lot 12)	2	2028	2	2028
Production: FY 2019 Deliveries	1	2022	1	2023
Production: FY 2020 Deliveries	1	2023	2	2023
Production: FY 2021 Deliveries	2	2023	1	2024

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604786N / Offensive Anti-Surface Warfare Weapon Dev		Project (Number/Name) 3337 / Offensive Anti-Surface Warfare (OASuW) Weapon	
	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
Production: FY 2022 Deliveries	3	2024	1	2025
Production: FY 2023 Deliveries	1	2025	4	2025
Production: FY 2024 Deliveries	2	2026	2	2027
Classified support: Classified support	3	2022	2	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604786N / Offensive Anti-Surface Warfare Weapon Dev				Project (Number/Name) 3343 / Offensive Anti-Surface Warfare (OASuW) Weapon Increment II			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3343: Offensive Anti-Surface Warfare (OASuW) Weapon Increment II	0.000	0.000	151.871	95.797	-	95.797	99.327	83.220	84.517	86.213	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Department of the Navy is developing Offensive Anti-Surface Warfare Weapon Increment II (OASuW Inc 2), also known as Hypersonic Air-Launched OASuW (HALO), (PU 3343) to address weapon system requirements based on the OASuW Analysis of Alternatives (AoA). OASuW Inc 2/HALO will be a carrier-suitable, higher-speed, longer-range, air-launched weapon system providing superior Anti-Surface Warfare capabilities. The program is part of the Navy's Long Range Fires investment approach to meet objectives of the National Defense Strategy. As a key component of this strategy, OASuW Inc 2/HALO will address advanced threats from engagement distances that allow the Navy to operate in, and control, contested battle space in littoral waters and Anti-Access/Area Denial (A2/AD) environments. To the maximum extent possible, the Navy will leverage technology being matured in the Science and Technology (S&T) and rapid prototyping arenas to support aggressive schedule execution. The OASuW Inc 2/HALO program will progress through a competitive technical maturation and design development period which will provide the foundation for a sole-source Engineering, Manufacturing and Development contract. Department approved requirements are documented in a Service Level Capabilities Development Document. In order to counter the evolving near-peer threat capability, OASuW Inc 2/HALO is required to be fielded in FY 2029.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: OASuW Increment II/HALO Development Program	0.000	151.871	95.797	0.000	95.797
Articles:	-	-	-	-	-
FY 2023 Plans: This Program was an FY 2023 New Start. The Navy initiated a Technology Development program leveraging the results of the Analysis of Alternatives (AoA) and Science & Technology prototyping efforts and technology demonstrations. The program will make targeted investments in maturing subsystem technologies, as well as component or full-scale prototyping activities, for application in the OASuW mission set and associated environment. FY 2023 matures critical technologies and funds multiple contractors through Technical Review 1 (TR#1), an evaluation of the functional baseline's ability to satisfy the performance requirements.					
FY 2024 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604786N / <i>Offensive Anti-Surface Warfare Weapon Dev</i>		Project (Number/Name) 3343 / <i>Offensive Anti-Surface Warfare (OASuW) Weapon Increment II</i>	

<u>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</u> FY 2024 continues the maturation of the critical technologies and prototyping efforts culminating in Technical Review 2 (TR#2). TR#2 is a technical assessment ensuring the physically allocated baseline will be operationally effective. <i>FY 2024 OCO Plans:</i> N/A <i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> Decrease from FY 2023 to FY 2024 is due to FY 2023 congressional interest in supporting program increases to Hypersonic OASuW Inc II. FY 2024 will be the second year of execution and will continue progression of program efforts.	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Accomplishments/Planned Programs Subtotals	0.000	151.871	95.797	0.000	95.797

C. Other Program Funding Summary (\$ in Millions)
N/A

Remarks

D. Acquisition Strategy
 The OASuW Inc 2/ HALO acquisition strategy was signed on 23 November 2022 by the Acquisition Decision Authority (ADA).

 OASuW Inc 2/HALO will leverage significant Science & Technology investments in critical technologies and requirements definition to implement an acquisition strategy that will deliver an affordable capability to the warfighter. The acquisition strategy will define the program in terms of cost and performance parameters that will trace to mission objectives based on a robust understanding of the capability and technical trade space.

 The Government expects the acquisition to follow a competitive, phased approach with initial activities focusing on system concepts, model-based systems engineering, preliminary design and technology development and technology integration efforts. Successful offerors may have the opportunity to continue with detailed design and production activities as part of future contracting efforts.

 The effort involves the use of Digital Engineering (DE) and Model-Based Systems Engineering (MBSE) practices for requirements, design, trade studies, and analyses; as well as the use of DE/MBSE to accomplish technical planning for qualification, component/subsystem testing, manufacturing, and sustainment of the system under representative operational conditions in future phases of the program.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604786N / <i>Offensive Anti-Surface Warfare Weapon Dev</i>	Project (Number/Name) 3343 / <i>Offensive Anti-Surface Warfare (OASuW) Weapon Increment II</i>
<p>The program will utilize a Middle Tier of Acquisition approach per Section 804 of the FY 2016 National Defense Authorization Act (NDAA), as amended in FY 2017 NDAA (codified at 10 U.S.C. sub sec 2302 note). It will be executed as a Rapid Prototyping effort with a focus on rapid development of a carrier-suitable hypersonic propulsion system.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604786N / Offensive Anti-Surface Warfare Weapon Dev				Project (Number/Name) 3343 / Offensive Anti-Surface Warfare (OASuW) Weapon Increment II					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development - Preliminary Design	C/CPIF	NSMA : Washington, DC	0.000	0.000		67.100	Aug 2023	6.869	Aug 2024	-		6.869	Continuing	Continuing	Continuing
Product Development - Preliminary Design	C/FFP	TBD : TBD	0.000	0.000		62.810	Mar 2023	61.838	Mar 2024	-		61.838	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		129.910		68.707		-		68.707	Continuing	Continuing	N/A
Remarks															
Prime contract and NSMA funding support initial funding to take vendor through preliminary design technical assessment. FY 2023 Congressional add of \$67.1M allows for second vendor through preliminary design, significantly reducing technical and schedule risk and preserving competition for second phase.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Support	WR	NAWCAD : Patuxent River, MD	0.000	0.000		8.467	Mar 2023	8.636	Nov 2023	-		8.636	Continuing	Continuing	Continuing
Government Support	WR	NAWCWD : China Lake, CA	0.000	0.000		3.894	Mar 2023	3.670	Nov 2023	-		3.670	Continuing	Continuing	Continuing
Development Support	C/CPFF	NSMA : Washington, DC	0.000	0.000		7.678	Mar 2023	6.711	Jan 2024	-		6.711	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		20.039		19.017		-		19.017	Continuing	Continuing	N/A
Remarks															
Support costs consist of support from Government offices and contractor support experts associated with engineering, technical reviews, threat analysis, CONOPs, training and tactical assessments for OASuW Increment 2.															
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		0.862	Nov 2023	-		0.862	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604786N / Offensive Anti-Surface Warfare Weapon Dev					Project (Number/Name) 3343 / Offensive Anti-Surface Warfare (OASuW) Weapon Increment II				
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		2.255	Nov 2023	-		2.255	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	TBD	TBD : TBD	0.000	0.000		0.000		3.000	Jan 2024	-		3.000	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.000		6.117		-		6.117	Continuing	Continuing	N/A
Remarks															
Test and Evaluation costs consist of support from Government offices associated with establishing test and evaluation requirements and test plans for OASuW Increment 2 as well as efforts to standup modeling and simulation. Additionally, initial investments are required to develop new maritime targets.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Support	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.937	Mar 2023	0.956	Nov 2023	-		0.956	Continuing	Continuing	Continuing
Government Support	WR	NAWCWD : China Lake, CA	0.000	0.000		0.985	Mar 2023	1.000	Nov 2023	-		1.000	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		1.922		1.956		-		1.956	Continuing	Continuing	N/A
Remarks															
Management services consists of Non-Headquarters Program Office management teams required for the management of the program.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	0.000		151.871		95.797		-		95.797	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

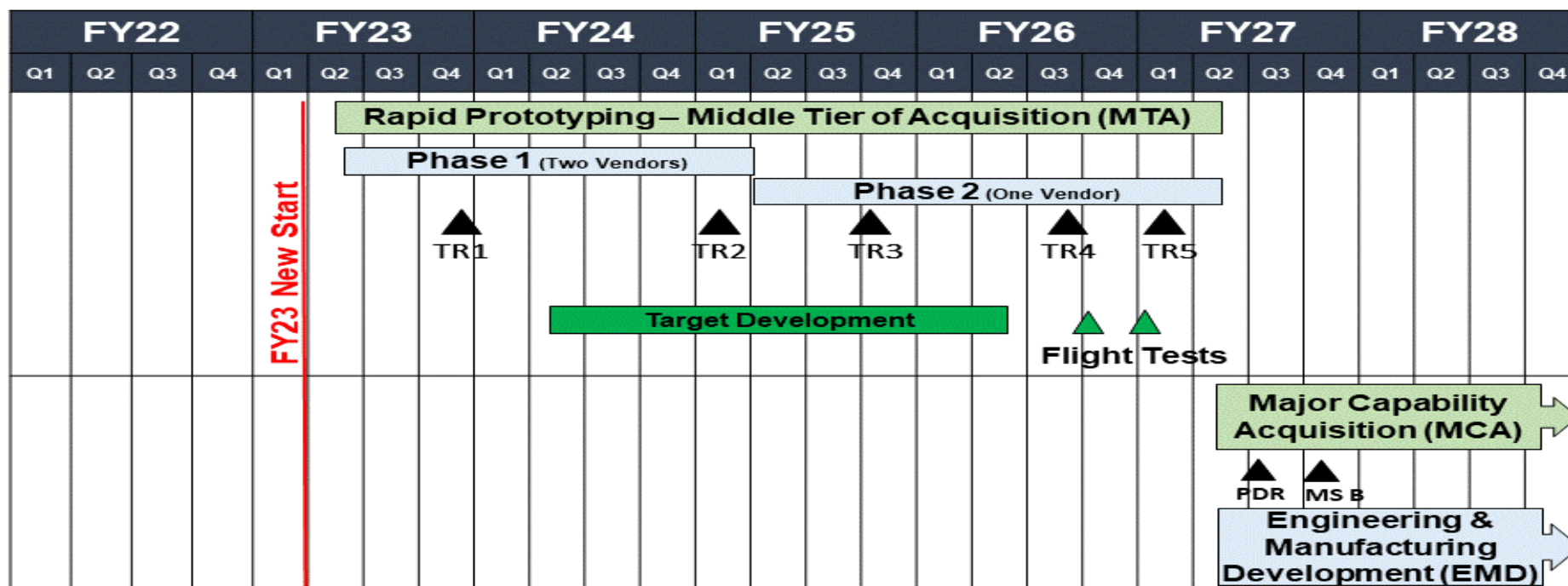
Appropriation/Budget Activity 1319 / 4
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R-1 Program Element (Number/Name) PE 0604786N / <i>Offensive Anti-Surface Warfare Weapon Dev</i>
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Project (Number/Name)
3343 / *Offensive Anti-Surface Warfare (OASuW) Weapon Increment II*



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604786N / <i>Offensive Anti-Surface Warfare Weapon Dev</i>	Project (Number/Name) 3343 / <i>Offensive Anti-Surface Warfare (OASuW) Weapon Increment II</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3343				
OASuW Increment 2/HALO: Rapid Prototyping - Middle Tier of Acquisition (MTA)	2	2023	2	2027
OASuW Increment 2/HALO: Phase 1 (Two Vendors)	2	2023	2	2025
OASuW Increment 2/HALO: Phase 2 (One Vendor)	2	2025	2	2027
OASuW Increment 2/HALO: Major Capability Acquisition (MCA) - Major Defense Acquisition Program (MDAP)	2	2027	4	2028
OASuW Increment 2/HALO: EMD Contract	2	2027	4	2028
Acquisitions Milestones: Preliminary Design Review	3	2027	3	2027
Acquisitions Milestones: Milestone B	4	2027	4	2027
Systems Development: Technical Review 1	4	2023	4	2023
Systems Development: Technical Review 2	1	2025	1	2025
Systems Development: Technical Review 3	4	2025	4	2025
Systems Development: Technical Review 4	3	2026	3	2026
Systems Development: Technical Review 5	1	2027	1	2027
Test and Evaluation: Target Development	2	2024	2	2026
Test and Evaluation: Flight Test 1	4	2026	4	2026
Test and Evaluation: Flight Test 2	1	2027	1	2027

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604786N / Offensive Anti-Surface Warfare Weapon Dev				Project (Number/Name) 3466 / LRASM C-3			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3466: LRASM C-3	0.000	39.342	65.375	141.858	-	141.858	185.424	93.301	29.537	11.901	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
The LRASM C-3 (PU 3466) is established to enhance the Navy's OASuW and incorporate a long range strike capability into the Navy's arsenal derived from the Navy's AGM-158C-1 LRASM and the Air Force's AGM-158 JASSM-ER. The Navy will integrate an AGM-158 derived weapon with extended range, enhanced radio and survivability onto F/A-18 aircraft and partner with USAF to further the capabilities of the AGM-158 product line. This funding line resources requirements for Navy strike mission integration and employment by upgrading the existing AGM-158C product to respond to rapidly changing threats.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: LRASM C-3 Development Program Articles: FY 2023 Plans: Continue development of LRASM C-3 land strike software, Beyond Line of Sight Software Weapons Data Link, enhanced range, advanced survivability, and integration on F/A-18. Develop software for strike mission planning, and missile Operational Flight Plan (OFP). Begin integration, ground and flight testing for shipboard storage and operations. FY 2024 Base Plans: Continue development of LRASM C-3 land strike software, Beyond Line of Sight Software Weapons Data Link, enhanced range, advanced survivability, and integration on F/A-18. Complete design verification test for the radio and subsystem and integrate M-Code radio. Continue development of software for strike mission planning, and missile Operational Flight Plan (OFP). Continue integration, ground and flight testing for shipboard storage and operations. Continue Subsystem development and Subsystem Qualification testing. Start construction of the free flight evaluation missiles. Complete Critical Design Review. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement:								39.342	65.375	141.858	0.000	141.858
								-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy								Date: March 2023				
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0604786N / Offensive Anti-Surface Warfare Weapon Dev				Project (Number/Name) 3466 / LRASM C-3				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
The increase from FY 2023 to FY 2024 supports the Navy's position to continue the aggressive acceleration of the C-3 development efforts to provide BLOS, enhanced range and advanced survivability to the LRASM family of weapons.												
Accomplishments/Planned Programs Subtotals								39.342	65.375	141.858	0.000	141.858
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost	
• WPN/2291: LRASM	161.212	219.662	639.636	-	639.636	180.439	334.313	406.150	413.359	0.000	2,809.833	
• WPN/2236: JASSM-ER Navy (AGM-158C-3)	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Remarks												
USN AGM-158 variant												
D. Acquisition Strategy												
The USAF owned JASSM Acquisition Strategy was amended and approved on September 8, 2017 for the development of the AGM-158B-2/D. This amendment enables the LRASM C-3 program to introduce upgrades which ensure its viability as the threat environment evolves.												
The Navy is leveraging USAF and USN investment in the AGM-158 family of weapons to provide a strike capability and enable further growth in the OASuW mission to optimize schedule, cost and performance tradeoffs. Utilization of the JASSM-ER/AGM-158 baseline enables rapid fielding of new capability without extensive non-recurring engineering and test efforts that would be required with a new weapon program. Commonality across the AGM-158 family enables the USN and USAF to continue to capitalize on joint development and production efficiencies to minimize recurring unit costs and improve operational flexibility.												
Navy funded software development will leverage the USAF investment to convert JASSM-ER software to a C++ software baseline, similar to LRASM, and focus on combining JASSM-ER range and strike capability, Beyond Line of Sight Weapons Data Link, advanced survivability, and LRASM OASuW capability into a merged Navy AGM-158 baseline. Future effort will expand both Navy strike and OASuW capabilities within the program.												
The Navy will produce an addendum to the AGM-158 acquisition strategy to address Navy unique integration requirements.												

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604786N / Offensive Anti-Surface War fare Weapon Dev				Project (Number/Name) 3466 / LRASM C-3					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/CPFF	Lockheed Martin Missile and Fire Control : Orlando, FL	0.000	26.624	Jun 2022	50.000	Mar 2023	84.954	Dec 2023	-		84.954	Continuing	Continuing	Continuing
Product Development	C/CPFF	NSMA : Washington DC	0.000	3.873	May 2022	0.000		13.500	Dec 2023	-		13.500	0.000	17.373	17.373
Product Development - Integration	C/CPFF	Lockheed Martin : Orlando, FL	0.000	1.250	May 2022	0.000		0.000		-		0.000	0.000	1.250	1.250
Product Development	C/CPFF	Data Link Solutions : Cedar Rapids, IA	0.000	4.500	Apr 2022	0.600	Apr 2023	10.000	Dec 2023	-		10.000	0.000	15.100	15.100
Subtotal			0.000	36.247		50.600		108.454		-		108.454	Continuing	Continuing	N/A
Remarks															
Continued prime contractor product development and radio integration of AGM-158 derived capability for the Navy. Funds software development and integration for mission planning, UAI and OFP. Integration testing and test support. Begin Hardware Technical Data Package (TDP) and software development efforts towards an enhanced communications development.															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Support	WR	NAWC AD : Patuxent River, MD	0.000	0.104	Apr 2022	2.585	Nov 2022	5.000	Nov 2023	-		5.000	Continuing	Continuing	Continuing
Government Support	WR	NAWC WD : China Lake, CA	0.000	0.450	Apr 2022	5.145	Nov 2022	6.000	Nov 2023	-		6.000	Continuing	Continuing	Continuing
Contractor Support	C/CPFF	NAWC AD : Patuxent River, MD	0.000	0.065	Jun 2022	1.326	Mar 2023	2.904	Mar 2024	-		2.904	Continuing	Continuing	Continuing
Contractor Support	C/CPFF	NSMA : Washington, DC	0.000	0.040	May 2022	3.586	Mar 2023	1.500	Dec 2023	-		1.500	Continuing	Continuing	Continuing
Contractor Support	C/CPFF	MIT Lincoln Lab : Lexington, MA	0.000	0.300	Jun 2022	0.300	Feb 2023	0.000		-		0.000	0.000	0.600	0.600
Subtotal			0.000	0.959		12.942		15.404		-		15.404	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0604786N / Offensive Anti-Surface Warfare Weapon Dev					Project (Number/Name) 3466 / LRASM C-3				
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Remarks Support costs consist of support from government office and contractor support experts associated with engineering, software development and integration, threat analysis, CONOPs, and training and tactical assessments. Support of enhanced communications development. Costs increase from FY 2023 to FY 2024 in order to support the accelerated development of the C-3 and the transition of labor requirements to C-3 with the completion of LRASM 1.1 Development effort.															
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NAWC AD : Patuxent River, MD	0.000	0.000		0.000		1.000	Nov 2023	-		1.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NAWC WD : China Lake, CA	0.000	2.113	Apr 2022	0.699	Mar 2023	8.000	Nov 2023	-		8.000	Continuing	Continuing	Continuing
Subtotal			0.000	2.113		0.699		9.000		-		9.000	Continuing	Continuing	N/A
Remarks Test and Evaluation costs support test planning, flight testing, system qualifications, range time and target costs. Develops and executes the Navy AGM-158 integrated test program. Costs increase from FY 2023 to FY 2024 in order to support the accelerated development of the C-3, to include the Fuel System Test and Insensitive Munitions Test.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Support	WR	NAWC AD : Patuxent River, MD	0.000	0.000	Apr 2022	0.630	Nov 2022	4.000	Nov 2023	-		4.000	Continuing	Continuing	Continuing
Government Support	WR	NAWC WD : China Lake, CA	0.000	0.023	Apr 2022	0.504	Nov 2022	5.000	Nov 2023	-		5.000	Continuing	Continuing	Continuing
Subtotal			0.000	0.023		1.134		9.000		-		9.000	Continuing	Continuing	N/A
Remarks Management services cost consist of non-headquarters program office management team (government labor and contractor support services) required for the management of the program. Cost increase from FY 2023 to FY 2024 in order to support the accelerated development of C-3 and the transition of labor requirements to C-3 with the completion of the LRASM 1.1 Development effort.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023			
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0604786N / Offensive Anti-Surface War fare Weapon Dev					Project (Number/Name) 3466 / LRASM C-3				
		Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		0.000	39.342		65.375		141.858		-		141.858	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

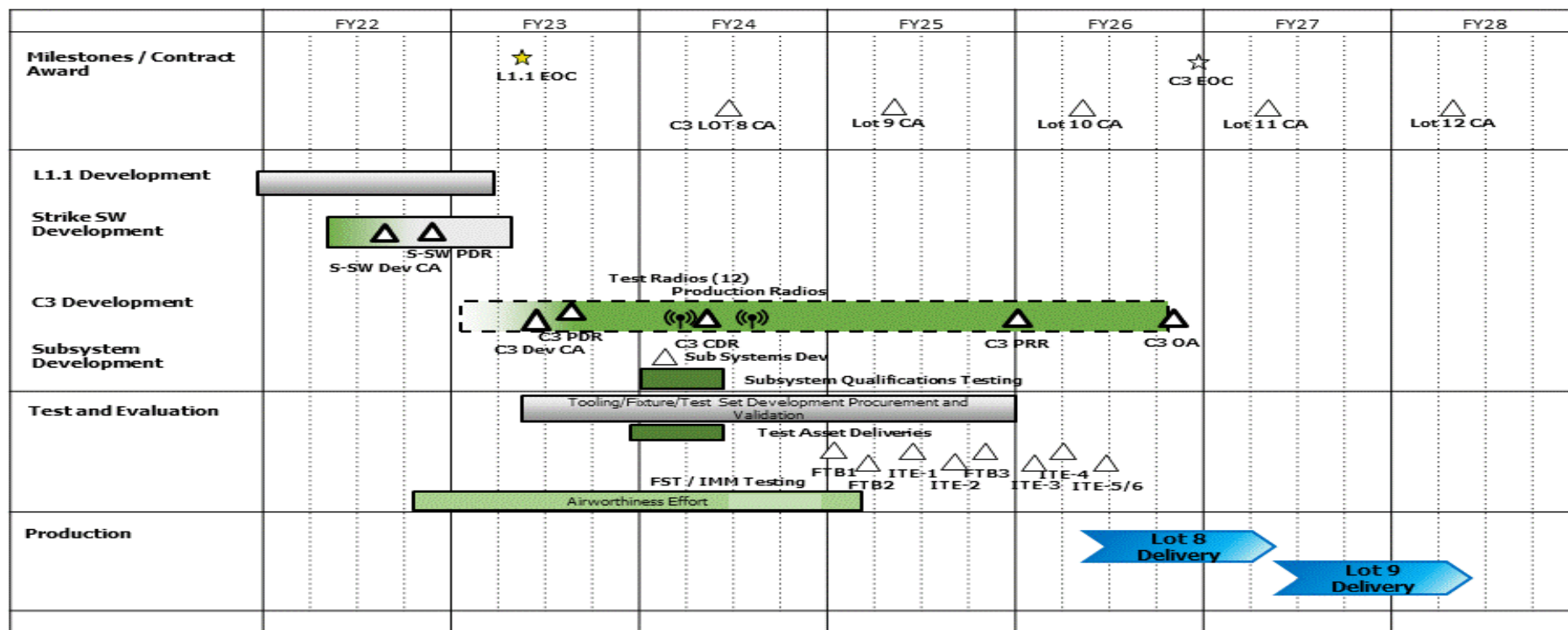
Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0604786N / Offensive Anti-Surface War
fare Weapon Dev

Project (Number/Name)
3466 / LRASM C-3



LRASM C-3 PB24 Schedule



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0604786N / *Offensive Anti-Surface Warfare Weapon Dev*

Project (Number/Name)

3466 / LRASM C-3

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3466				
Milestones / Contract Awards: LRASM C-3 Early Operational Capability	4	2026	4	2026
Milestones / Contract Awards: FY 2024 Contract Award	2	2024	2	2024
Milestones / Contract Awards: FY 2025 Contract Award	2	2025	2	2025
Milestones / Contract Awards: FY 2026 Contract Award	2	2026	2	2026
Milestones / Contract Awards: FY 2027 Contract Award	2	2027	2	2027
Milestones / Contract Awards: FY 2028 Contract Award	2	2028	2	2028
Development: Strike S/W Development	2	2022	2	2023
Development: Strike S/W Development Contract Award	3	2022	3	2022
Development: Strike S/W Preliminary Design Review	4	2022	4	2022
Development: LRASM C3 Development Contract Award	2	2023	2	2023
Development: LRASM C-3 Preliminary Design Review	3	2023	3	2023
Development: LRASM C-3 Critical Design Review	2	2024	2	2024
Development: LRASM C-3 PRR	1	2026	1	2026
Development: LRASM C-3 OA	4	2026	4	2026
Development: Subsystem Qualifications Testing	1	2024	2	2024
Test and Evaluation: Tooling/Fixture/Test Set Development Procurement and Validation	2	2023	1	2026
Test and Evaluation: FTB1	1	2025	1	2025
Test and Evaluation: FTB2	1	2025	1	2025
Test and Evaluation: FTB3	4	2025	4	2025
Test and Evaluation: ITE-1	2	2025	2	2025

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0604786N / Offensive Anti-Surface Warfare Weapon Dev		Project (Number/Name) 3466 / LRASM C-3
		Start		End
Events by Sub Project		Quarter	Year	Quarter Year
Test and Evaluation: ITE-2		3	2025	3 2025
Test and Evaluation: ITE-3		1	2026	1 2026
Test and Evaluation: ITE-4		2	2026	2 2026
Test and Evaluation: ITE-5/6		2	2026	2 2026
Test and Evaluation: Airworthiness Effort		4	2022	1 2025
Test and Evaluation: Fuel System Test and Insensitive Munitions Testing		3	2024	4 2024
Production: FY 2024 Deliveries		2	2026	2 2027
Production: FY 2025 Deliveries		2	2027	2 2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0605512N I MEDIUM UNMANNED SURFACE VEHICLES (MUSVs)							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	53.402	57.872	85.966	85.800	-	85.800	99.387	98.268	99.761	101.768	Continuing	Continuing
3428: Medium Unmanned Surface Vehicle (MUSV)	53.402	57.872	85.966	85.800	-	85.800	99.387	98.268	99.761	101.768	Continuing	Continuing

Note

FY 2020 and prior funding in Program Element (PE) 0603502N. Medium Unmanned Surface Vehicle (MUSV) (Project 3428) realigned from PE 0603502N in FY 2021. For FY23, the Navy realigned funding to PE 0605512N for purchase and integration of the Unmanned Surface Vessel Integrated Combat System (USV ICS) aboard MUSV, reflecting the Navy's vision of eventually fielding the USV ICS across all unmanned surface platforms. USV ICS is required for MUSV platforms for command and control of sensors and payloads. The USV ICS will support data fusion, forwarding and integration with manned combatants and the force common operating picture.

A. Mission Description and Budget Item Justification

Projects under this Program Element provide resources for the unmanned platforms in the Navy's Future Surface Combatant Force (FSCF), Medium Unmanned Surface Vehicle (MUSV), Sea Hunter, and Seahawk.

Medium Unmanned Surface Vehicle (MUSV) is defined as having a reconfigurable mission capability which is accomplished via modular payloads with an initial capability to support Battlespace Awareness through supporting Intelligence, Surveillance, Reconnaissance, and Targeting (ISR-&T), Counter_ISR&T, and Information Operations (IO) mission areas.

MUSVs provide affordable, high endurance, reconfigurable ships able to accommodate various payloads for unmanned missions and augment the Navy's manned surface force. MUSVs will be capable of semi-autonomous operation, with operators' in-the-loop or on-the-loop. USV Command and Control (C2) will be maintained via an afloat element (i.e., embarked on a United States Navy (USN) combatant/other assigned afloat asset) or via an ashore element (C2 station ashore).

While unmanned surface vehicles are new additions to fleet units, MUSV is intended to combine robust and proven commercial vessel specifications with existing military payloads to rapidly and affordably expand the capacity and capability of the surface fleet. The MUSV program leverages years of investment and full scale demonstration efforts in autonomy, endurance, command and control, payloads, and testing from the Defense Advanced Research Projects Agency (DARPA) Anti-Submarine Warfare Continuous Trail Unmanned Vessel (ACTUV), Office of Naval Research (ONR) Medium Displacement Unmanned Surface Vehicle (MDUSV)/Sea Hunter (FY 2017 to FY 2021), and Office of the Secretary of Defense Strategic Capabilities Office (OSD SCO) Ghost Fleet Overlord Large USV experimentation effort (FY 2018 to FY 2021). The combination of fleet-ready C2 solutions developed by the Ghost Fleet Overlord program and initial man-in-the-loop or man-on-the-loop control will reduce the risk of fleet integration of unmanned surface vehicles and allow autonomy and payload technologies to develop in parallel with fielding vehicles with standardized interfaces.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0605512N I MEDIUM UNMANNED SURFACE VEHICLES (MUSVs)			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	60.020	104.000	93.809	-	93.809
Current President's Budget	57.872	85.966	85.800	-	85.800
Total Adjustments	-2.148	-18.034	-8.009	-	-8.009
• Congressional General Reductions	-	-0.477			
• Congressional Directed Reductions	-	-17.557			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.148	0.000			
• Program Adjustments	0.000	0.000	-8.500	-	-8.500
• Rate/Misc Adjustments	0.000	0.000	0.491	-	0.491
<u>Change Summary Explanation</u>					
Program Change:					
Technical: Not applicable					
Schedule: Not applicable					
Cost:					
FY22: -\$2.148M SBIR/STTR/FTT Assessment (SBIR)					
FY23: -\$17.557M Direct Congressional reduction, -\$0.477 general Congressional reduction					
FY24: -8.500M MUSV program realignment; +\$0.491M Miscellaneous adjustments					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0605512N / MEDIUM UNMANNED SU RFACE VEHICLES (MUSVs)				Project (Number/Name) 3428 / Medium Unmanned Surface Vehicle (MUSV)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3428: Medium Unmanned Surface Vehicle (MUSV)	53.402	57.872	85.966	85.800	-	85.800	99.387	98.268	99.761	101.768	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

FY 2020 and prior funding in Program Element (PE) 0603502N. Medium Unmanned Surface Vehicle (MUSV) (Project 3428) realigned from PE 0603502N in FY 2021. For FY2023, the Navy realigned funding to PE 0605512N for purchase and integration of the Unmanned Surface Vessel Integrated Combat System (USV ICS) aboard MUSV, reflecting the Navy's vision of eventually fielding the USV ICS across all unmanned surface platforms.

A. Mission Description and Budget Item Justification

The Medium Unmanned Surface Vehicle (MUSV) one of two Unmanned Surface Vessels in the Future Combatant Force (FSCF) program. The MUSV project provides resources for the detail design, fabrication, testing, experimentation and support of the MUSV. The MUSV is defined as having a reconfigurable mission capability which is accomplished via modular payloads with an initial capability to support Battlespace Awareness through supporting Intelligence, Surveillance, Reconnaissance, and Targeting (ISR-&T), Counter-ISR&T (CISR&T), and Information Operations (IO) mission areas. Modular payloads may be developed separately by other programs or prototyping efforts and will be further developed and/or integrated into MUSV under the Unmanned Surface Vehicle Enabling Capabilities PE (0605513N) that supports MUSV and LUSV.

MUSVs will support the Navy's ability to produce, deploy and disburse ISR&T/C-ISR&T/IO capabilities in sufficient quantities and provide/improve distributed situational awareness in maritime Areas of Responsibility (AORs). MUSVs will be capable of weeks-long deployments and trans-oceanic transits, and operate aggregated with Carrier Strike Groups (CSGs) and Surface Action Groups (SAGs), as well as have the ability to deploy independently. The MUSV will be a key enabler of the Navy's Distributed Maritime Operations (DMO) concept.

In FY 2020, the Navy conducted a full and open competition for a MUSV prototype, conducting source selection activities Q1-Q3 of FY20. In July 2020, the Navy announced they had awarded a Detail Design & Fabrication (DD&F) contract to L3 Harris for the delivery of the first MUSV prototype for \$35M. The contract contains options for up to 8 additional MUSVs (9 total) for a total contract price of \$281M. L3 Harris will be the system integrator, while also supplying the autonomy and perception systems. Subcontractors Gibbs & Cox and Incat Crowther will provide vessel design and modification services, while the vessel will be produced by Swiftships Shipyard. All work will be performed in various sites along the Louisiana Gulf Coast.

MUSV Machinery Plant - Supports prime contractor detail design, machinery procurement, installation and integration, and test/demonstration support for USV Land Based Test Site (LBTS). LBTS is required to demonstrate unmanned operation of main propulsion and electrical generation/distribution at a minimum of threshold mission duration requirements prior to entering MS B as required by the FY21 NDAA.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023				
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0605512N / MEDIUM UNMANNED SURFACE VEHICLES (MUSVs)	Project (Number/Name) 3428 / Medium Unmanned Surface Vehicle (MUSV)				
MUSV Land Based Test Site (LBTS)- Provides Engineering support for the detail design, procurement, installation and integration, test and demonstration plan development, and test and demonstration execution in support of MUSV LBTS.							
The Sea Hunter and Seahawk Operations and sustainment project provides resources for the operation and sustainment of the Sea Hunter and Seahawk.							
The Sea Hunter and Seahawk are experimentation vessels operated by the Navy's Surface Development Squadron, and are currently homeported in San Diego, CA. Seahawk was delivered to ONR and subsequently transferred ownership to PMS 406 Q3 FY21. Through continued operations and demonstrations utilizing these vessels, the Navy continues to gain valuable insights and lessons learned in the utilization of unmanned systems and their associated payloads. This knowledge influences both Concept of Operation/Employment doctrine to guide fleet operations, as well as requirements documents for future USV systems.							
Sea Hunter and Seahawk will provide a means for demonstrating a payloads ability to operate in an autonomous manner with no engineering support for multi-day operations simulating a MUSV operational environment. Sea Hunter and Seahawk will inform PMS 406 on technologies for MUSV that demonstrate successfully the Navy's ability to produce, deploy and disburse ISR&T/C-ISR&T/IO capabilities in sufficient quantities and provide/improve distributed situational awareness in maritime Areas of Responsibility (AORs).							
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: MUSV Product Development			41.772	68.675	64.601	0.000	64.601
Articles:			-	-	-	-	-
FY 2023 Plans:							
Execution of the MUSV DD&F contract will continue, with a focus on completion of construction of the vessel and executing an Over Target Schedule (OTS).							
The Government will continue to assess and direct the incorporation of any Engineering Change Proposals (ECPs) based on findings during the fabrication of the MUSV prototype in support of the MUSV Program of Record. These ECPs will include upgrading the MUSV prototype payload interfaces, autonomy behaviors, C4I interfaces, USV ICS interfaces, and maturation of Machinery Control System in support of the MUSV prototype certification, Technology Readiness Assessments, and the planned Milestone review prior to the award of the MUSV Program of Record (WBS 1.0, WBS 2.0, WBS 3.0, WBS 4.0 and WBS 5.0).							
The MUSV LBTS will have a STA certified HM&E plant by Q4 FY2023. Post NDAA demonstration, the MUSV LBTS will be utilized to conduct additional reliability testing in support of MUSV Acceptance Trials, Developmental/Operational Testing, and the MUSV Program of Record (POR).							

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023					
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0605512N / MEDIUM UNMANNED SURFACE VEHICLES (MUSVs)		Project (Number/Name) 3428 / Medium Unmanned Surface Vehicle (MUSV)				
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)				FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>In FY23, The Government will finalize the test plans for Dock Trials and Acceptance Trials followed by System Qualification Testing scheduled in FY2024. In FY2023, Sea Hunter and Seahawk will support the operational tempo required by the Navy to execute multiple Fleet exercises and extended duration transits, which will enable the development of tactics, training, and procedures, as well as validate capabilities through experimentation (WBS 6.0).</p> <p>The MUSV LBTS efforts in FY23 will be incorporated into the Performance Specification and captured in the MUSV Program of Record acquisition documents and associated artifacts (WBS 1.0). Furthermore, the MUSV program will continue the refinement of requirements and acquisition documentation including a Capability Development Document, SEP, TEMP, LCSP, Cybersecurity Strategy, Open Systems Architecture Management Plan, Quality Assurance Program Plan, Reliability and Maintainability Program Plan, Configuration Management Plan, Software Development Plan, NTSP and PPP, and all other artifacts leading up to a planned Milestone review prior to the award of the MUSV Program of Record. Purchase and integration of the prototype USV ICS hardware aboard the MUSV prototype as well as the purchase of a new payload are also planned in FY23 (WBS 3.0 and WBS 6.0) to support MUSV missions. This will be the first payload purchase for the MUSV prototype. Efforts in FY23 will also include maturation of the Sea Hunter and Seahawk autonomy and C4I systems to enable the full integration of the prototype platforms into the Fleet networks.</p> <p>FY 2024 Base Plans:</p> <p>In FY24, the MUSV prototype will transition from fabrication and integration to execution of Dock Trials in late Q2FY24 followed by the execution of Sea Trials in early Q3FY2024. System Qualification Testing for the MUSV prototype is scheduled for Q4FY2024 (WBS 6.0).</p> <p>In FY24, The Government will finalize the test plans for Developmental Testing (DT) and continue to mature the Master Test Strategy to define the requirements for Operational Testing (OT). Starting in Q1FY2025, the MUSV Program will transition from Contractor Testing (CT) to Government Developmental Testing (DT) to verify that vessel meets the MUSV TLRs (WBS 6.0). In FY24, The ICS and payload hardware, purchased in FY23, will be incrementally delivered and prepared for integration aboard the MUSV prototype (WBS 3.0 and WBS 6.0). Checkout and industrial testing will be conducted on the USV ICS hardware in support of shipboard integration. Additionally, software development for the integration of the MUSV payload and ICS with the shipboard autonomy and C4I system will continue in support of the MUSV prototype certification, Technology Readiness Assessments, and the planned Milestone review prior to the award of the MUSV Program of Record (WBS 2.0, WBS 3.0, WBS 4.0, WBS 5.0, and WBS 6.0). Similar to FY23, the refinement of requirements and</p>								

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0605512N / MEDIUM UNMANNED SURFACE VEHICLES (MUSVs)		Project (Number/Name) 3428 / Medium Unmanned Surface Vehicle (MUSV)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
acquisition documentation will continue leading up to a planned Milestone review prior to the award of the MUSV Program of Record. Advanced reliability testing will continue at the MUSV LBTS to support the development of Performance Specification for the MUSV Program of Record (WBS 1.0). Furthermore, in FY24, the upgraded C4I and autonomy systems for the Sea Hunter and Seahawk will be installed and tested (WBS 2.0). In addition, in FY24, Sea Hunter and Seahawk will support the operational tempo required by the Navy to execute multiple Fleet exercises and extended duration transits, which will enable the development of tactics, training, and procedures, as well as validate capabilities through experimentation (WBS 6.0). FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Decrease of \$4.074 due to reduced systems engineering efforts for MUSV prototype post CDR as well as reduced hardware purchasing requirements for payload, ICS, and C4I systems for the MUSV prototype, Sea Hunter and Seahawk platforms.						
Title: MUSV Support <div>Articles:</div>		14.600 -	11.923 -	15.708 -	0.000 -	15.708 -
FY 2023 Plans: Execution of sustainment contracts for Sea Hunter and Seahawk will continue in FY23 to support Fleet operations and exercises to further mature Concept of Operation/Employment for USVs and inform requirements definition of the MUSV Program of Record (WBS 6.0). Validation of capabilities through experimentation with the MUSV prototype, Sea Hunter and Seahawk will continue in FY23 to support requirements definition for MUSV Program of Record. The MUSV Program will continue to provide engineering and operational support for experimental payload integration and demonstration as well as Systems Engineering Support of any Engineering Change Proposals or Ship Alternations required to support continued availability of the Sea Hunter and Seahawk. FY 2024 Base Plans: In addition to executing sustainment contracts for Sea Hunter and Seahawk, FY24 efforts will also include executing support contracts to enable sustainment of the MUSV prototype, scheduled to be delivered in Q4FY24 for Acceptance Trials followed by System Qualification Testing. The sustainment contracts will directly support Fleet operations and exercises to further mature Concept of Operation/Employment for USVs and inform requirements definition of the MUSV Program of Record (WBS 6.0). Similar to FY23, the MUSV Program will						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0605512N / MEDIUM UNMANNED SURFACE VEHICLES (MUSVs)		Project (Number/Name) 3428 / Medium Unmanned Surface Vehicle (MUSV)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
continue to provide engineering and operational support for experimental payload integration and demonstration to support continued availability of the Sea Hunter, Seahawk, and the MUSV prototype during Fleet exercises (WBS 6.0). FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Increase of \$3.785M due to increased operational availability of Sea Hunter and Seahawk as well as the addition of Dock Trials, Sea Trials, System Qualification Testing, and Planning for Developmental Testing for the MUSV prototype.						
Title: MUSV Management Articles:		1.500 -	5.368 -	5.491 -	0.000 -	5.491 -
FY 2023 Plans: Continue to provide management oversight of DD&F contract including implementation of the MUSV certification plan. Continue to provide management oversight of the Sea Hunter and Seahawk C4I upgrades. Continue drafting of MUSV Capabilities Development Document to capture warfighting requirements of future increment of MUSV. Maintain compliance with DoDI 5000.80 via updating program documentation. Develop governing MUSV program acquisition and requirements documentation and supporting program developmental plans to prepare for a planned Milestone review prior to the award of the MUSV Program of Record.						
FY 2024 Base Plans: Continue to provide management oversight of DD&F contract including the formal delivery of the MUSV prototype to the Government and transition to Developmental Testing in Q3FY24. Continue to provide management oversight of the Sea Hunter and Seahawk C4I upgrades. Continue drafting of MUSV Capabilities Development Document to capture warfighting requirements of future increment of MUSV. Maintain compliance with DoDI 5000.80 via updating program documentation. Develop governing MUSV program acquisition and requirements documentation and supporting program developmental plans to prepare for a planned Milestone review prior to the award of the MUSV Program of Record.						
FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy									Date: March 2023		
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0605512N / MEDIUM UNMANNED SURFACE VEHICLES (MUSVs)				Project (Number/Name) 3428 / Medium Unmanned Surface Vehicle (MUSV)			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	
Increase of \$.123M due to annual inflation of the labor rates.											
Accomplishments/Planned Programs Subtotals						57.872	85.966	85.800	0.000	85.800	
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RDTE/0603178N/3066: Large Unmanned Surface Vessel (LUSV)	98.871	136.580	117.400	-	117.400	127.855	127.006	129.431	131.729	Continuing	Continuing
• RDTE/0605513N/3067: Unmanned Surface Vehicle Enabling Capabilities	115.436	181.534	176.261	-	176.261	293.493	213.290	190.510	195.165	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
<p>MUSV has been designated as a Rapid Prototyping Program designation and follows a Middle Tier Acquisition approach per Section 804 of the Fiscal Year (FY) 2016 National Defense Authorization Act (NDAA), as amended in FY 2017 NDAA (codified at 10 U.S.C. sub sec 2302 note). Required capabilities were codified in a Top Level Requirements (TLR) document approved by the OPNAV Director of Surface Warfare in FY 2019. While there are no MUSV funded in the FY 2024-FY 2028 FYDP, the structure of the contract awarded to L3 Harris in July 2020 allows for options to be added should funding become available. Delivery of the initial prototype is planned in Q4 FY 2024 followed by Developmental and Operational Testing. The prototyping efforts with the FY 2019 MUSV will inform procurement of additional MUSV units and transition to an ACAT program with formalized requirements through a Capability Development Document and procurement funding as part of a decision in future budgets.</p>											
<p>The MUSV LBTS will consist of one Main Propulsion Diesel Engine (MPDE) and one Ship Service Diesel Generator (SSDG) with all the necessary support and test equipment at a contractor facility in FY2023. The MUSV LBTS will have a STA certified HM&E plant by Q4 FY2023. Post NDAA demonstration, the MUSV LBTS will be utilized to conduct additional reliability testing in support of MUSV Acceptance Trials, Developmental/Operational Testing, and the MUSV Program of record (POR).</p>											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0605512N / MEDIUM UNMANNED SURFACE VEHICLES (MUSVs)				Project (Number/Name) 3428 / Medium Unmanned Surface Vehicle (MUSV)					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering	WR	Various : Various	5.429	5.300	Jan 2022	10.170	Jan 2023	7.352	Oct 2023	-		7.352	Continuing	Continuing	Continuing
Vessel Construction and Integration	C/FPIF	L3 Harris : Melbourne, FL	2.950	3.500	Jan 2022	3.000	Jan 2023	3.000	Oct 2023	-		3.000	Continuing	Continuing	Continuing
Logistics Package Development	C/FPIF	L3 Harris : Melbourne, FL	2.188	0.000		1.100	Jan 2023	2.100	Oct 2023	-		2.100	Continuing	Continuing	Continuing
C4I/PNT GFE Development/Integration	Various	Various : Various	0.000	12.200	Jan 2022	10.903	Jan 2023	5.118	Oct 2023	-		5.118	Continuing	Continuing	Continuing
Payload Development/Integration	Various	Various : Various	2.750	3.800	Jan 2022	10.200	Jan 2023	7.481	Oct 2023	-		7.481	Continuing	Continuing	Continuing
LBES MUSV Machinery Plant	Various	Various : Various	14.000	0.000		0.000		0.000		-		0.000	14.000	28.000	-
LBES - Land Based Engineering Test Site	Various	Various : Various	15.100	0.000		7.502	Oct 2022	5.500	Oct 2023	-		5.500	Continuing	Continuing	Continuing
MUSV Integrated Combat System HW Purchase and Integration	Various	Various : Various	0.000	0.000		8.000	Jan 2023	2.300	Oct 2023	-		2.300	Continuing	Continuing	Continuing
MUSV Integrated Combat System Testing	Various	Various : Various	0.000	0.000		0.000		4.500	Jan 2024	-		4.500	0.000	4.500	-
Sea Hunter/Seahawk Demonstration and Fleet Operations	Various	Various : Various	2.000	12.928	Jan 2022	17.800	Oct 2022	20.198	Oct 2023	-		20.198	0.000	52.926	-
MUSV Testing and Fleet Operations	Various	Various : Various	0.000	0.000		0.000		7.052	Jan 2024	-		7.052	0.000	7.052	-
Demonstration Planning	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Government Demonstration Support	WR	Various : Various	0.000	1.544	Jan 2022	0.000		0.000		-		0.000	0.000	1.544	-
Cyber Security Testing	C/BA	Not Specified : Not Specified	2.100	2.500	Jan 2022	0.000		0.000		-		0.000	0.000	4.600	-
Subtotal			46.517	41.772		68.675		64.601		-		64.601	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0605512N / MEDIUM UNMANNED SURFACE VEHICLES (MUSVs)						Project (Number/Name) 3428 / Medium Unmanned Surface Vehicle (MUSV)			
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Sea Hunter Support	Various	Various : Various	3.185	4.400	Jan 2022	4.800	Jan 2023	6.204	Jan 2024	-		6.204	Continuing	Continuing	Continuing
Seahawk Support	Various	Various : Various	2.200	4.400	Oct 2021	4.800	Jan 2023	6.204	Jan 2024	-		6.204	Continuing	Continuing	Continuing
Sea Hunter/Seahawk Milcomms Upgrade	Various	Various : Various	0.000	5.800	Oct 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MUSV 1 Support	TBD	TBD : TBD	0.000	0.000		2.323	Jan 2023	3.300	Oct 2023	-		3.300	0.000	5.623	-
Subtotal			5.385	14.600		11.923		15.708		-		15.708	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Requirement Development	WR	Various : Various	0.800	0.800	Oct 2021	4.608	Oct 2022	4.700	Oct 2023	-		4.700	Continuing	Continuing	Continuing
Acquisition Management	WR	Various : Various	0.700	0.700	Oct 2021	0.760	Oct 2022	0.791	Oct 2023	-		0.791	Continuing	Continuing	Continuing
Subtotal			1.500	1.500		5.368		5.491		-		5.491	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			53.402	57.872		85.966		85.800		-		85.800	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

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1319 / 4

[illegible]

PE 0605512N / MEDIUM UNMANNED SURFACE VEHICLES (MUSVs)

Project (Number/Name)	Start Date	End Date	Duration (Days)	Progress (%)	Status	Notes
101	2023-01-01	2023-01-15	14	100	Completed	Project 101 completed on time.
102	2023-01-15	2023-02-01	16	75	In Progress	Project 102 is 75% complete.
103	2023-02-01	2023-02-15	14	50	In Progress	Project 103 is 50% complete.
104	2023-02-15	2023-03-01	15	25	In Progress	Project 104 is 25% complete.
105	2023-03-01	2023-03-15	14	10	In Progress	Project 105 is 10% complete.
106	2023-03-15	2023-03-31	15	0	Not Started	Project 106 has not started yet.
107	2023-03-31	2023-04-15	15	0	Not Started	Project 107 has not started yet.
108	2023-04-15	2023-04-30	15	0	Not Started	Project 108 has not started yet.
109	2023-04-30	2023-05-15	15	0	Not Started	Project 109 has not started yet.
110	2023-05-15	2023-05-31	15	0	Not Started	Project 110 has not started yet.

3428 / *Medium Unmanned Surface Vehicle (MUSV)*

Medium Unmanned Surface Vehicle (MUSV)	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028										
MUSV #1	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q							
					Construction																														
											GFE Integration																								
												Contractor Testing																							
													Delivery																						
												Logistics Package Development																							
															DT and OT											Fleet Experimentation Operations									
														Payload Procurement, Integration and Testing																					
													USV Integrated Combat System HW Purchase and Integration																						
													USV Integrated Combat System Testing																						
In-Service Engineering														ECP Development																					
Fleet Experimentation														Sea Hunter Experimentation																					
														Seahawk Experimentation																					
Sea Hunter and Seahawk C4I Upgrade														C4I Upgrade																					
MUSV Program of Record													Acquisition & Requirements Documentation																						

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy														Date: March 2023																											
Appropriation/Budget Activity 1319 / 4														R-1 Program Element (Number/Name) PE 0605512N / MEDIUM UNMANNED SURFACE VEHICLES (MUSVs)								Project (Number/Name) 3428 / Medium Unmanned Surface Vehicle (MUSV)																			
MUSV (continued)														FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
														1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Land Based Test Site (LBTS) Block I																																									
														Detail Design, Installation and Integration																											
Land Based Test Site																																									

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0605512N / MEDIUM UNMANNED SURFACE VEHICLES (MUSVs)

Project (Number/Name)

3428 / Medium Unmanned Surface Vehicle (MUSV)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Medium Unmanned Surface Vehicle (MUSV)				
MUSV #1: Construction	1	2022	3	2024
MUSV #1: GFE Integration	2	2024	3	2024
MUSV #1: Contractor Testing	3	2024	4	2024
MUSV #1: Delivery	4	2024	4	2024
MUSV #1: Logistics Package Development	1	2022	4	2026
MUSV #1: Developmental and Operational Testing	2	2025	2	2026
MUSV #1: Fleet Experimentation Operations	1	2028	2	2028
MUSV #1: Payload Purchase, Integration and Testing	2	2023	4	2028
MUSV #1: USV Integrated Combat System HW Purchase and Integration	2	2023	4	2025
MUSV #1: USV Integrated Combat System Testing	1	2024	4	2028
In-Service Engineering: Engineering Change Proposal (ECP) Development	2	2022	4	2028
Fleet Experimentation: Sea Hunter Experimentation	1	2022	4	2028
Fleet Experimentation: Seahawk Experimentation	1	2022	4	2028
Sea Hunter and Seahawk C4I Upgrade: Sea Hunter and Seahawk C4I Upgrade	3	2022	4	2024
MUSV Program of Record: Program Acquisition and Requirements Documentation	1	2023	4	2026
MUSV (continued)				
Land Based Test Site (LBTS) Block I: Detail Design, Installation and Integration	1	2022	3	2023
Land Based Test Site (LBTS) Block I: FY21 NDAA Required Test and Demonstration	3	2022	4	2023
Land Based Test Site: Follow-on Test and Demonstration	1	2024	4	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy Date: March 2023

Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	0.000	115.436	181.534	176.261	-	176.261	293.493	213.290	190.510	195.165	Continuing	Continuing
3067: Unmanned Surface Vehicle Enabling Capabilities	0.000	115.436	181.534	176.261	-	176.261	293.493	213.290	190.510	195.165	Continuing	Continuing

Note

Unmanned Surface Vehicle (USV) Enabling Capabilities (Project 3067) was a new start in FY 2020. FY 2020 funding in Program Element (PE) 0603502N. Project 3067 realigned from PE 0603502N to PE 0603178N in FY 2021, and from 0603178N to 0605513N in FY 2022 and future years.

A. Mission Description and Budget Item Justification

Project 3067 provides resources to develop enabling capabilities and critical technologies for the unmanned platforms in the Navy's Future Surface Combatant Force (FSCF) and Unmanned Surface Vehicle (USV) Family of Systems (FoS). This includes the development and transition of technologies, standardizing Autonomy architectures, Command & Control (C2) systems, USV Integrated Combat Systems (USV ICS) and learning through demonstration during both ashore and underway fleet exercises to support key capabilities (autonomy, communications, USV Operations Centers, sensors/component integration, data management, machinery qualification and payload prototyping) for operating Unmanned Surface Vehicles to meet mission needs. These efforts continue to maintain federated systems while encouraging the transition of Small Business Innovation Research (SBIR), Future Naval Capabilities (FNC), other DOD Science and Technology (S&T) efforts, and current Program of Record (PoR) systems to support a modular system for enhanced performance and affordability.

The USV Enabling Capabilities program is responsible for the development and improvement of USV autonomous systems, payloads, and sensors in support of machinery and Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR) and USV Integrated Combat Systems (USV ICS) operations on USVs. Enabling Capabilities leads the development, modification, engineering, and integration activities, facilitating the unmanned operations of surface vessels. This includes capabilities to support autonomy, C2 beyond line of sight, monitoring, and securing sensitive equipment from remote locations. These capabilities support Medium Unmanned Surface Vehicles (MUSV), Large Unmanned Surface Vessels (LUSV), and Unmanned Operations Centers.

Project 3067 also provides a Navy-wide program to develop required standards for Autonomy, C2, Payload Interface, and USV Operations Centers in support of future unmanned surface vehicle development.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity		R-1 Program Element (Number/Name)			
1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	119.560	181.620	192.885	-	192.885
Current President's Budget	115.436	181.534	176.261	-	176.261
Total Adjustments	-4.124	-0.086	-16.624	-	-16.624
• Congressional General Reductions	-	-0.086			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-4.124	0.000			
• Program Adjustments	0.000	0.000	-17.508	-	-17.508
• Rate/Misc Adjustments	0.000	0.000	0.884	-	0.884
<u>Change Summary Explanation</u>					
Program Changes:					
Technical: Not applicable					
Schedule: Not applicable					
Cost:					
FY 2022: -\$4.124M SBIR/STTR/FTT Assessment (SBIR)					
FY 2023: -\$0.086M general Congressional reduction					
FY 2024: -\$17.508M program adjustments; +\$0.884M Miscellaneous adjustments					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES				Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3067: Unmanned Surface Vehicle Enabling Capabilities	0.000	115.436	181.534	176.261	-	176.261	293.493	213.290	190.510	195.165	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Unmanned Surface Vehicle (USV) Enabling Capabilities (Project 3067) FY 2020 funding in Program Element (PE) 0603502N. Project 3067 realigned from PE 0603502N to PE 0603178N in FY 2021, and from PE 0603178N to PE 0605513N in FY 2022 and future years.

A. Mission Description and Budget Item Justification

In order to accelerate future capability and support steady growth of the Navy's Unmanned Surface Vehicle (USV) Family of Systems (FoS), the USV Enabling Capabilities project includes the development, test, and integration of USV technologies, the advancement of Defense Advanced Research Projects Agency (DARPA), Office of the Secretary of Defense (OSD) Strategic Capabilities Office (SCO), Office of Naval Research (ONR) and Industry USV efforts for associated technologies, and the development and fabrication of payloads for Large Unmanned Surface Vessels (LUSVs) and Medium Unmanned Surface Vehicles (MUSVs). USV technology efforts in this project unit support the development and demonstration of autonomy, communications, USV Operations Centers, sensor and component integration for navigation compliance and reliability, data management, machinery qualification, noncombat payload development, and enabling technologies for other USVs in the USV FoS, as applicable. In support of this development work, the Navy has developed a holistic USV work breakdown structure (WBS) framework to help coordinate developmental and systems engineering efforts applicable across the USV portfolio. The WBS categories are divided into broad key enablers, including HM&E (1.0), C4I (2.0), USV ICS (3.0), Common Control System (CCS) (4.0), autonomy/perception/data (5.0), and prototyping efforts (6.0).

The HM&E (WBS 1.0) portion of this project supports laboratory modeling and testing of contractor furnished Machinery Control Solutions as well as vendor qualification of engines.

The C4I (WBS 2.0) portion of this project funds efforts to develop, test, and demonstrate autonomous communication hardware and software. A key enabler to allow man-in-the-loop or man-on-the-loop control of the USVs and USV FoS will be the development of an unmanned communications suite. Initial efforts have focused on the modification of existing Program of Record of Program Executive Office (PEO) C4I systems. Further efforts are needed to engineer autonomous behaviors into the Navy's next generation of PEO C4I systems to meet USV operational needs. Additionally, this effort will include the modification and testing of cryptographic equipment as needed to obtain the necessary approvals and certifications for use in unmanned, high-threat environments.

The USV ICS (WBS 3.0) portion of this project will fund efforts to develop common combat components across all USVs and integrate the data collected and transferred from a USV into the Aegis Combat Systems in support of distributed maritime operations.

The CCS (WBS 4.0) portion of this project will fully support the continued development of USV control software.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES	Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities				
The autonomy/perception/data (WBS 5.0) portion of this project funds efforts to standardize autonomy architecture and interfaces, develop and test low Technology Readiness Level (TRL) autonomy functions, software modeling and simulation, and employ a Secure Development and Operations (DevSecOps) software pipeline to facilitate integration and ensure security. These autonomy efforts are executed under the Rapid Autonomy Integration Laboratory (RAIL) framework and include advanced development, prototyping, and demonstrations. The sensor and component integration for navigation compliance and reliability portion of this project funds efforts to analyze the performance of commercial hardware/software and integrate those sensors/components into USVs for improved performance. These funds also identify gaps in performance for future SBIRs, Department of Defense Science and Technology efforts, and industry feedback as well as establish standards of performance for future contracting actions. The data management portion of this project will develop the data infrastructure needed to collect, store, and analyze data from the USVs in order to certify system performance, maintain and improve software, and identify sensors/components in need of further improvement.							
The prototyping efforts (WBS 6.0) portion of this project funds outfitting of the USV Operations Center. These Operations Centers will allow the Fleet to control multiple USVs and multiple types of USVs simultaneously, conduct exercises, and continue CONOPS development. This portion of the project also funds the development and acquisition of noncombat modular payloads employed by USVs. Payloads will be customized to meet Navy needs and demonstrate useful capability for the Fleet. Some examples include Intelligence, Surveillance, and Reconnaissance (ISR) payloads as well as persistent airborne systems that extend the C2 reach of host platforms.							
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)			FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Product Development			79.799	157.974	148.325	0.000	148.325
Articles:			-	-	-	-	-
FY 2023 Plans:							
C4I (WBS 2.0) - Unmanned communication development and testing will continue as well as unmanned cryptographic development. USV ICS (WBS 3.0) - USV ICS development work will commence in this project in the form of integrating and transferring data obtained from a USV into USV ICS for use by a US Navy combatant. CCS (WBS 4.0) - Continued development efforts incorporating lessons learned from experimentation and demonstrations. Autonomy/perception/data (WBS 5.0) - Finalize refactoring of autonomy software and begin extensive testing to identify/fix capability gaps in meeting the minimum Technology Readiness Level requirements of the 2019 and 2021 National Defense Authorization Acts (NDAAs). Sensor and perception development and testing will continue to support the requirements of the NDAAs. The RAIL will continue to be expanded to accommodate new users. Prototyping (WBS 6.0) - This program element will acquire one C-TEP payload prototype and one C-TEM payload. In addition, this program element will begin the transition of additional an Office of Naval Research Future Naval Capability payload called Amon Hen.							
FY 2024 Base Plans:							
C4I (WBS 2.0) - Unmanned communication development and testing will continue as well as unmanned cryptographic development. The first phase of modifications to Government Program of Record systems to support unmanned operations will be completing. USV ICS (WBS 3.0) - USV ICS development work will continue in this project in the form of integrating and transferring data obtained from a USV into USV ICS for							

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES		Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
use by a US Navy combatant. CCS (WBS 4.0) - Continued development efforts incorporating lessons learned from experimentation and demonstrations. Autonomy/perception/data (WBS 5.0) - Finalize autonomy software testing to meet the minimum Technology Readiness Level requirements of the 2019 and 2021 National Defense Authorization Acts (NDAAs). Build and integrate a Government-owned software baseline, informed by the FY23 capability gap analysis. Sensor and perception testing will continue to support the requirements of the NDAAs. The RAIL will support the development of the Government-owned software baseline. Prototyping (WBS 6.0) - This program element will perform testing on the C-TEP prototype payload, including integration with autotomy, and install and test one C-TEM payload. The Amon Hen effort (Office of Naval Research Future Naval Capability payload) will procure Next Generation Surface Search Radar (NGSSR) and integration into a USV prototype. Amon Hen will be used during at test events in FY24. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: The decrease in funding from FY23 to FY24 (~\$9.6M) is primarily due to a deferral of procurement of a C-TEM payload, as well as a slowing of Amon Hen development, to allow for analysis of results from initial testing and experimentation for these payloads.						
Title: Support <div>Articles:</div> FY 2023 Plans: Autonomy/perception/data (WBS 5.0) - Efforts will continue on the development of UMAA standards, autonomy Interface Control Documents (ICDs), and common control systems. Maintenance of Command and Control software (i.e., CCS) will continue. Prototyping (WBS 6.0) - Land-based USV Operations Centers will be completely established and operational and support for USV squadron operations will continue. FY 2024 Base Plans: Autonomy/perception/data (WBS 5.0) - Efforts will continue on the development of UMAA standards, autonomy Interface Control Documents (ICDs), and common control systems. Maintenance of Command and Control software (i.e., CCS) will continue. Prototyping (WBS 6.0) - Integration of additional capabilities into the land-based USV Operations Centers and support for USV squadron operations will continue. FY 2024 OCO Plans:		31.470 -	19.310 -	23.606 -	0.000 -	23.606 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES		Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: The increase in funding need from FY23 to FY24 (+~\$4M) is primarily due to an increase of support for Naval Base Ventura County. As additional prototype USVs are homeported, additional Fleet personnel are assigned to SURFDEVRON1, and USV operations increase.						
Title: Management Services Articles: FY 2023 Plans: Continue to provide oversight and management of product development and support efforts. Continue program management activities and management for the production of the prototype modular payloads awarded in FY2023. Continue coordination with and across supporting activities (e.g., PEO IWS, PEO C4I, DARPA, OSD SCO, ONR, warfare centers, labs, and industry partners) to address requirements, manage funding, and execute plans. Continue to develop and refine required acquisition documents and artifacts that support required capabilities managed under this project. FY 2024 Base Plans: Continue to provide oversight and management of product development and support efforts. Continue program management activities and management for the production of the prototype modular payloads awarded in FY2024. Continue coordination with and across supporting activities (e.g., PEO IWS, PEO C4I, DARPA, OSD SCO, ONR, warfare centers, labs, and industry partners) to address requirements, manage funding, and execute plans. Continue to develop and refine required acquisition documents and artifacts that support required capabilities managed under this project. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: The increase from FY23 to FY24 is within normal inflation (~2%).		4.167 -	4.250 -	4.330 -	0.000 -	4.330 -
Accomplishments/Planned Programs Subtotals		115.436	181.534	176.261	0.000	176.261

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy									Date: March 2023		
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES				Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• RD TEN/0603178N/3066: Large Unmanned Surface Vessel (LUSV)	98.871	136.580	117.400	-	117.400	127.855	127.006	129.431	131.729	Continuing	Continuing
• RD TEN/0605512N/3428: Medium Unmanned Surface Vehicle (MUSV)	57.872	85.966	85.800	-	85.800	99.387	98.268	99.761	101.768	Continuing	Continuing
Remarks											
D. Acquisition Strategy											
USV Enabling Capabilities efforts will accelerate future capability and support steady growth of the Navy's Unmanned Surface Vehicle (USV) Family of Systems (FoS). This will occur by leveraging efforts from the Department of Defense Research and Development Enterprise and industry for associated technologies and payloads and integrating them into USVs at the appropriate level of technical maturity. Coordination with UxS platforms will eliminate redundant efforts, encourage innovation and improve coordination of unmanned systems across multiple domains. Leveraging Office of the Secretary of Defense (OSD) Strategic Capabilities Office (SCO)-developed standalone capabilities, the plan is to develop these capabilities for the initial prototype USVs and then transition those capabilities into Program of Record USVs through incremental development and integration across the funding portfolio. The Navy will accomplish efforts under USV Enabling Capabilities through existing contract vehicles prepared for OSD SCO and Office of Naval Research (ONR) efforts, the USV FoS Indefinite Delivery Indefinite Quantity (IDIQ) Multiple Award Contract (MAC) which was awarded in FY 2020, the prime contract awarded for MUSV design and fabrication, existing contracts for payload fabrication, and future contracts for further software development and maintenance.											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES				Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Services	WR	Various : Various	0.000	1.690	Oct 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Elevated Sensors	C/CPIF	GDMS : Fairfax, VA	0.000	5.500	Jun 2022	7.000	Dec 2022	2.208	Aug 2024	-		2.208	Continuing	Continuing	Continuing
Unmanned Communications	Various	Variuos : Various	0.000	21.376	Mar 2022	38.874	Oct 2022	37.801	Oct 2023	-		37.801	Continuing	Continuing	Continuing
Unmanned Cryptographic Systems	Various	Various : Various	0.000	5.000	Mar 2022	5.100	Oct 2022	5.200	Oct 2023	-		5.200	Continuing	Continuing	Continuing
USV Machinery Qualification	C/CPIF	Various : Various	0.000	21.733	Jul 2022	0.000		0.000		-		0.000	0.000	21.733	-
Low TRL Autonomy	Various	Various : Various	0.000	18.500	Nov 2021	28.860	Oct 2022	29.570	Oct 2023	-		29.570	0.000	76.930	-
Rapid Autonomy Integration Laboratory (RAIL)	Various	Various : Various	0.000	5.000	Dec 2021	7.520	Oct 2022	6.300	Oct 2023	-		6.300	0.000	18.820	-
Sensors and Perceptions	WR	Various : Various	0.000	1.000	Dec 2021	3.040	Oct 2022	4.200	Oct 2023	-		4.200	0.000	8.240	-
USV ICS Development	WR	Various : Various	0.000	0.000		52.000	Oct 2022	50.800	Oct 2023	-		50.800	0.000	102.800	-
Amon Hen (N96C&F)	WR	Various : Various	0.000	0.000		15.580	Oct 2022	12.246	Oct 2023	-		12.246	0.000	27.826	-
Subtotal			0.000	79.799		157.974		148.325		-		148.325	Continuing	Continuing	N/A
Remarks															
Project Moved from Program Element 0603178N															
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Autonomy Standrads (UMAA)	Various	Various : Various	0.000	1.000	Oct 2021	1.020	Oct 2022	2.500	Oct 2023	-		2.500	Continuing	Continuing	Continuing
Command and Control (C2) Integration	Various	Various : Various	0.000	2.400	Oct 2021	3.450	Oct 2022	4.566	Oct 2023	-		4.566	Continuing	Continuing	Continuing
USV Squadron Operations	WR	Various : Various	0.000	7.000	Oct 2021	7.140	Oct 2022	10.240	Oct 2023	-		10.240	Continuing	Continuing	Continuing
Delta Requirements RFP Development Evaluation	WR	Various : Various	0.000	1.870	Oct 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES						Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities			
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
RFP Development	WR	Various : Various	0.000	0.500	Dec 2021	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
USV Operations Center (UOC)	WR	Various : Various	0.000	18.700	Nov 2021	7.700	Oct 2022	6.300	Oct 2023	-		6.300	Continuing	Continuing	Continuing
Subtotal			0.000	31.470		19.310		23.606		-		23.606	Continuing	Continuing	N/A
Remarks Project Moved from Program Element 0603178N															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	Various	Various : Various	0.000	4.167	Oct 2021	4.250	Oct 2022	4.330	Oct 2023	-		4.330	Continuing	Continuing	Continuing
Subtotal			0.000	4.167		4.250		4.330		-		4.330	Continuing	Continuing	N/A
Remarks Project Moved from Program Element 0603178N															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	115.436		181.534		176.261		-		176.261	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																Date: March 2023			
Appropriation/Budget Activity 1319 / 4								R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES								Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities			

USV Enabling Capabilities	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Project Moved from PE 0603178N	■																											
Autonomy																												
UMAA ICD Development																												
UMAA ICD Spiral Development & Reference Implementation																												
Low TRL Function Development																												
Platform Autonomy Development and Support																												
Unmanned Communications Development																												
Unmanned Cryptographic Systems																												
Command and Control (C2)																												
USV Operations Center																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

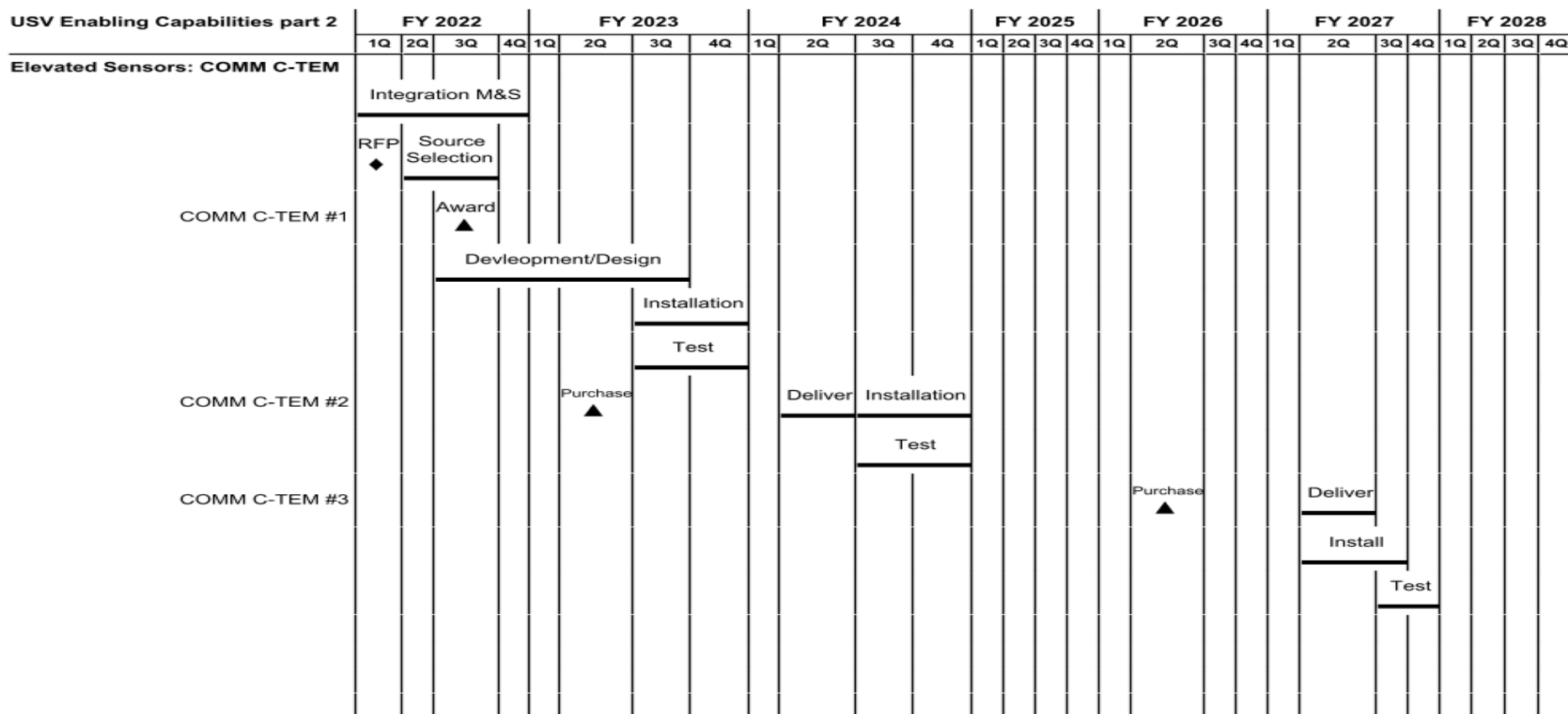
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R-1 Program Element (Number/Name)	Program Element Description	Program Element Status	Program Element Comments

PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES

Project (Number/Name)	Start Date	End Date	Status	Manager	Budget (USD)	Actual Cost (USD)	Progress (%)	Risk Level	Notes
101	2023-01-15	2023-03-31	Completed	John Doe	150000	148000	100	Low	Project completed ahead of schedule.
102	2023-02-01	2023-05-15	In Progress	Jane Smith	220000	180000	82	Medium	Minor delays in procurement.
103	2023-03-01	2023-06-30	On Hold	Mike Johnson	180000	0	0	High	Waiting for client approval.
104	2023-04-10	2023-07-31	Planned	Sarah Lee	95000	0	0	Low	Initial planning phase.
105	2023-05-01	2023-08-31	On Hold	David Kim	110000	0	0	Medium	Resource allocation pending.
106	2023-06-01	2023-09-30	Planned	Emily White	75000	0	0	Low	Scope definition in progress.
107	2023-07-01	2023-10-31	Planned	Chris Brown	130000	0	0	Medium	Vendor selection ongoing.
108	2023-08-01	2023-11-30	Planned	Alex Green	60000	0	0	Low	Feasibility study phase.
109	2023-09-01	2023-12-31	Planned	Olivia Black	80000	0	0	Medium	Initial requirements gathering.
110	2023-10-01	2024-01-31	Planned	Noah Grey	50000	0	0	Low	Concept development phase.

3067 / Unmanned Surface Vehicle Enabling Capabilities



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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy														Date: March 2023																		
Appropriation/Budget Activity 1319 / 4										R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES										Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities												
USV Enabling Capabilities part 4	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028							
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
USV Machinery Qualification Contracts																																
	Qualification Contracts																															
USV ICS development																																
	USV ICS development																															
Amon Hen																																
	Development																															
	Delivery One Exercise				Delivery Two Exercise				Major Exercise 1				Major Exercise 2				Major Exercise 3															
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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

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R-1 Program Element (Number/Name)

PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES

Project (Number/Name)

3067 / Unmanned Surface Vehicle Enabling Capabilities

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
USV Enabling Capabilities				
Project Moved from PE 0603178N: New PE	1	2022	1	2022
Autonomy: UMAA ICD Development: ICD Development & Delivery	1	2022	2	2022
Autonomy: UMAA ICD Spiral Development & Reference Implementation: UMAA ICD Spiral Development & Reference Implementation	1	2022	4	2028
Autonomy: Low TRL Function Development: Low TRL Function Development	1	2022	4	2028
Autonomy: Platform Autonomy Development and Support: Platform Autonomy Development and Support	2	2022	4	2028
Autonomy: Platform Autonomy Development and Support: Platform Autonomy Management	4	2022	4	2028
Autonomy: Platform Autonomy Development and Support: Data Management Infrastructure	1	2022	4	2028
Unmanned Communications Development: Unmanned Communications Development	1	2022	4	2028
Unmanned Cryptographic Systems: Unmanned Cryptographic Systems	1	2022	4	2025
Command and Control (C2): CCS Spiral Development	1	2022	4	2028
USV Operations Center: Establishment	2	2022	4	2023
USV Operations Center: Sustainment	1	2024	4	2028
USV Enabling Capabilities part 2				
Elevated Sensors: COMM C-TEM: Integration Modeling and Simulation	1	2022	4	2022
Elevated Sensors: COMM C-TEM: RFP Release	1	2022	1	2022
Elevated Sensors: COMM C-TEM: Source Selection	2	2022	3	2022
Elevated Sensors: COMM C-TEM: COMM C-TEM #1: Award	3	2022	3	2022
Elevated Sensors: COMM C-TEM: COMM C-TEM #1: Development/Design	3	2022	3	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

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R-1 Program Element (Number/Name)

PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES

Project (Number/Name)

3067 / Unmanned Surface Vehicle Enabling Capabilities

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Elevated Sensors: COMM C-TEM: COMM C-TEM #1: Installation	3	2023	4	2023
Elevated Sensors: COMM C-TEM: COMM C-TEM #1: Test	3	2023	4	2023
Elevated Sensors: COMM C-TEM: COMM C-TEM #2: (1) Unit Purchase	2	2023	2	2023
Elevated Sensors: COMM C-TEM: COMM C-TEM #2: Unit Delivered	2	2024	2	2024
Elevated Sensors: COMM C-TEM: COMM C-TEM #2: Installation	3	2024	4	2024
Elevated Sensors: COMM C-TEM: COMM C-TEM #2: Test	3	2024	4	2024
Elevated Sensors: COMM C-TEM: COMM C-TEM #3: (1) Unit Purchase	2	2026	2	2026
Elevated Sensors: COMM C-TEM: COMM C-TEM #3: Unit Delivered	2	2027	2	2027
Elevated Sensors: COMM C-TEM: COMM C-TEM #3: Installation	2	2027	3	2027
Elevated Sensors: COMM C-TEM: COMM C-TEM #3: Test	3	2027	4	2027
USV Enabling Capabilities part 3				
Elevated Sensors: PAYLOAD C-TEP: Award for Functional Development (RIF Prototype)	3	2022	3	2022
Elevated Sensors: PAYLOAD C-TEP: Functional Development & Testing (RIF Prototype)	3	2022	1	2023
Elevated Sensors: PAYLOAD C-TEP: Award for Autonomy Development (RIF Prototype)	4	2022	4	2022
Elevated Sensors: PAYLOAD C-TEP: Autonomy Development (RIF Prototype)	4	2022	1	2024
Elevated Sensors: PAYLOAD C-TEP: Install C-TEP (RIF Prototype) on OUSV	2	2024	2	2024
Elevated Sensors: PAYLOAD C-TEP: Demonstrate C-TEP (RIF Prototype) on OUSV	2	2024	2	2024
Elevated Sensors: PAYLOAD C-TEP: Procure (1) production Units (CTEP Baseline)	1	2026	1	2026
Elevated Sensors: PAYLOAD C-TEP: Install and Test production Unit	1	2027	3	2027
Elevated Sensors: PAYLOAD C-TEP: PAYLOAD C-TEP: Procure (2) production Units	2	2027	2	2027
Elevated Sensors: PAYLOAD C-TEP: Install and Test production Units	2	2028	3	2028
USV Squadron: Common Support	1	2022	4	2028
USV Enabling Capabilities part 4				

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0605513N / UNMANNED SURFACE VEHICLE ENABLING CAPABILITIES		Project (Number/Name) 3067 / Unmanned Surface Vehicle Enabling Capabilities	
		Start		End	
Events by Sub Project		Quarter	Year	Quarter	Year
USV Machinery Qualification Contracts: Qualification Contracts		3	2022	2	2026
USV ICS development: USV ICS development		1	2023	4	2028
Amon Hen: Development (FY22 Future Navy Capability)		1	2023	4	2027
Amon Hen: Delivery of first Rough Casper developmental unit & support one exercise		1	2023	4	2023
Amon Hen: Delivery of first Rough Casper developmental unit & support two exercise		1	2024	4	2024
Amon Hen: Support of Major Exercise 1 (Does not encompass acquisition)		1	2025	4	2025
Amon Hen: Support of Major Exercise 2 (Does not encompass acquisition)		1	2026	4	2026
Amon Hen: Support of Major Exercise 3 (Does not encompass acquisition)		1	2027	4	2027

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0605514M / GROUND BASED ANTI-SHIP MISSILE							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	28.194	98.762	43.090	36.383	-	36.383	19.558	3.999	3.856	23.715	Continuing	Continuing
6637: Ground Based Anti-Ship Missile	28.194	98.762	43.090	36.383	-	36.383	19.558	3.999	3.856	23.715	Continuing	Continuing

A. Mission Description and Budget Item Justification

As the Marine Corps' first Ground Based Anti-Ship Missile (GBASM) capability, the Navy/Marine Expeditionary Ship Interdiction System (NMESIS) is a priority central to the Marine Corps' contribution to the Naval Expeditionary Force's (NEF) anti-surface warfare campaign. This is a critical Service modernization capability requirement focused specifically on countering the Nation's pacing threat. Ground based launchers add a new type of threat against a peer adversary, stress different surveillance, and offensive systems, are hard to detect and track in a cluttered environment and add a significant level of persistence and depth to existing anti-ship capabilities. NMESIS will be employed by Medium-range Missile (MMSL) batteries serving as part of Marine Littoral Regiments (MLR) conducting Expeditionary Advanced Base Operations (EABO) while persisting inside the adversary's weapons engagement zone (WEZ). When integrated into sensor and communication networks supporting a naval/maritime mission thread, and synchronized with employment of other missile systems, the Marine Corps' MMSL battery will serve as a component of the NEF "stand-in force" in support of the naval sea control effort.

NMESIS consists of two Naval Strike Missiles (NSM) and a launcher/weapon control system integrated on to a ground-based, teleoperated carrier (called ROGUE-Fires). It will provide a ground based anti-access/area denial, anti-ship capability. This program includes design, development, test, and production of the NSM launcher, ROGUE-Fires carrier, Leader kit, Weapons Control System (WCS), and Command and Control (C2) connections to enable the transport and firing of NSMs. NMESIS makes extensive use of proven sub-systems, such as the Joint Light Tactical Vehicle (JLTV) chassis, the U.S. Navy's Naval Strike Missile, and its WCS.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	102.716	43.090	17.797	-	17.797
Current President's Budget	98.762	43.090	36.383	-	36.383
Total Adjustments	-3.954	0.000	18.586	-	18.586
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.954	0.000			
• Rate/Misc Adjustments	0.000	0.000	18.586	-	18.586

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0605514M / GROUND BASED ANTI-SHIP MISSILE
<div>Change Summary Explanation</div> <div>The decrease of \$6.707M from FY 2023 to FY 2024 reflects the completion of developmental and operation testing, transition into production, and initiates development of Engineering Change Proposals (ECPs).</div>		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0605514M / GROUND BASED ANTI-SH IP MISSILE				Project (Number/Name) 6637 / Ground Based Anti-Ship Missile			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
6637: Ground Based Anti-Ship Missile	28.194	98.762	43.090	36.383	-	36.383	19.558	3.999	3.856	23.715	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

As the Marine Corps' first Ground Based Anti-Ship Missile (GBASM) capability, the Navy/Marine Expeditionary Ship Interdiction System (NMESIS) is a force design priority central to the Marine Corps' contribution to the Naval Expeditionary Force's (NEF) surface warfare campaign. This is a critical Service modernization capability requirement focused specifically on countering the Nation's pacing threat. Ground-based launchers add a new type of threat against a peer adversary, stress different surveillance and offensive systems, are hard to detect and track in a cluttered environment, and add a significant level of persistence and depth to existing anti-ship capabilities. NMESIS will be employed by Medium-range Missile (MMSL) batteries within the Marine Divisions and will be especially suited for operations with Marine Littoral Regiments and Marine Expeditionary Units and when integrated into sensor and communication networks supporting a naval/maritime mission thread, and synchronized with employment of other missile systems, the NMESIS-equipped MMSL batteries will serve as a component of the NEF "stand-in force" providing lethal, precision anti-ship fires supporting sea denial and sea control operations. NMESIS consists of two Naval Strike Missiles (NSM) and a launcher/weapon control system integrated on to a ground-based, teleoperated carrier (called ROGUE-Fires).

It will provide a ground based anti-access/area denial, anti-ship capability.

This program includes design, development, test and production of the NSM launcher, Weapons Control System (WCS), ROGUE-Fires Carrier, Leader Kit, and Command and Control (C2) connections to enable the transport and firing of NSMs.

NMESIS makes extensive use of proven sub-systems, such as the Joint Light Tactical Vehicle (JLTV) chassis, the U.S. Navy's Naval Strike Missile and its WCS.

In FY 2023, NMESIS conducted multiple test events including Electromagnetic Environmental Effects (E3), electromagnetic signature (SIG) testing/characterization, and initiated New Equipment Training (NET). In addition, NMESIS conducted the Initial Operational Test & Evaluation (IOT&E) Guided Flight Test (GFT) in FY 2023.

In FY 2024, NMESIS will complete NET and the remaining IOT&E events including ballistic testing. In addition, NMESIS will initiate the development and integration of Engineer Change Proposals (ECPs) that focus on the continuous improvement of communications, navigation, and product support. These planned efforts enhance the capability fielded in FY 2023 to allow for future growth within the fielded MMSL batteries through simultaneous fire control of multiple launchers by a single section and increased capabilities for navigation and product support - allowing for a larger range of operating environments and employment techniques.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Navy Marine Expeditionary Ship Interdiction System (NMESIS)	98.762	43.090	36.383	0.000	36.383
Articles:	-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0605514M / GROUND BASED ANTI-SHIP MISSILE		Project (Number/Name) 6637 / Ground Based Anti-Ship Missile		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>FY 2023 Plans:</p> <ul style="list-style-type: none">- Complete development of platoon level mission planning software- Continue fleet and user evaluations to refine initial doctrine and develop New Equipment Training products, increasing capacity with additional assets as they are delivered- Purchase ballistic test missiles (QTY 6) to support FY 2024 IOT&E testing- Conduct E3 testing- Conduct SIG testing/characterization- Initiate NET for IOT&E with Production Representative Models (PRM)- Conduct GFT in support of IOT&E <p>FY 2024 Base Plans:</p> <p>Testing Activities:</p> <ul style="list-style-type: none">- Complete NET for IOT&E with PRMs- Conduct IOT&E to include ballistic tests <p>Communications ECPs:</p> <ul style="list-style-type: none">-Develop and integrate Common C4 software for the NMESIS Weapon Control System to enable fire control of multiple NMESIS Launchers-Radio integration to ROGUE-Fires to integrate tactical radios in USMC inventory for increased commonality <p>Navigation ECPs:</p> <ul style="list-style-type: none">-Integrate required M-CODE receivers to replace current Position, Navigation, and Timing (PNT) devices-Develop and integrate software with Retrotraverse - enabling rapid displacement after firing-Develop and integrate software with Basic Waypoint Navigation - enabling basic robotic navigation-Develop and integrate Obstacle Avoidance - allowing the ROGUE-Fires to safely navigate around an obstacle-Develop and integrate Night Capable Camera to allow for tactical operations in low light conditions <p>Product Support ECPs:</p> <ul style="list-style-type: none">-Develop a solution for improved Encanistered Missile handling by the Resupply System and allow for faster reload on the NSM Launch Unit <p>FY 2024 OCO Plans:</p>						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy									Date: March 2023				
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0605514M / GROUND BASED ANTI-SH IP MISSILE				Project (Number/Name) 6637 / Ground Based Anti-Ship Missile					
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)									FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A													
FY 2023 to FY 2024 Increase/Decrease Statement: The decrease of \$6.707M from FY 2023 to FY 2024 reflects the completion of developmental and operation testing, transition into production, and initiates development of Engineering Change Proposals (ECPs).													
Accomplishments/Planned Programs Subtotals									98.762	43.090	36.383	0.000	36.383
C. Other Program Funding Summary (\$ in Millions)													
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost		
• PMC/2212: Artillery Weapons System	221.347	143.808	165.268	-	165.268	302.261	361.454	296.097	163.386	Continuing	Continuing		
• PMC/2292: Naval Strike Missile (NSM)	0.000	174.369	169.726	-	169.726	170.845	169.913	169.878	170.428	Continuing	Continuing		
• PMC/2292C: Naval Strike Missile (NSM)	0.000	0.000	39.244	-	39.244	30.087	20.930	14.391	0.000	Continuing	Continuing		
Remarks													
BLI 2212 Artillery Weapons System includes funding for HIMARS, GBASM, and LRF.													
D. Acquisition Strategy													
The GBASM concept started as an effort to conduct a live-fire, guided flight demonstration of ground based anti-ship capability in order to inform future requirements. The program entered into Milestone B in 4th quarter 2021 and was designated ACAT III with a tailored MCA program with a Milestone C planned for FY 2023.													
The NMESIS program is leveraging a prototype development effort to integrate the existing Naval Strike Missile (NSM), currently being procured by the U.S. Navy as part of their Over-the-Horizon Missile Launching System (OTH-MLS), onto a tele-operated Joint Light Tactical Vehicle (JLTV) based launcher called the Remotely Operated Ground Unit for Expeditionary Fires (ROGUE-Fires), and develop/integrate the C2 and mobility control components onto a separate manned command vehicle.													
Production contracts awarded in FY 2022 for the baseline configuration approved at the Critical Design Review (CDR). These contracts will cover procurement of systems for Initial Operational Test & Evaluation (IOT&E), Low Rate Initial Production, Full Rate Production, Contractor Logistics Support and spares. There will be two Marine Corps production contracts: Remotely-operated carrier (ROGUE-Fires); Launcher and fire control system. The Missile procurement will be accomplished via a Navy contract executed through the Navy Over-the-Horizon (OTH) Weapons Systems program office. The Other Transaction Authority (OTAs) agreements used to develop the initial systems will continue to be used to support program office testing through FY 2023 and may be used for future capability development. Developmental													

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605514M / GROUND BASED ANTI-SHIP MISSILE	Project (Number/Name) 6637 / Ground Based Anti-Ship Missile
<p>and operational system testing will be conducted in coordination with the Marine Corps Operational Test and Evaluation Activity. Additionally, missile testing will be coordinated with PM OTH-WS as part of their operational testing.</p> <p>Initial sustainment strategy reflects Contractor Logistics Support (CLS). Commonality with JLTV and OTH-WS components will support accelerated transition to primary organic logistics support, augmented where necessary by CLS.</p> <p>In conjunction with the Force Design 2030 Artillery Modernization plan, MMSL batteries will require an increase in capability to allow for future growth within the MMSL batteries. These enhanced capabilities will be achieved through multiple communication, navigation, and product support ECPs.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0605514M / GROUND BASED ANTI-SH IP MISSILE				Project (Number/Name) 6637 / Ground Based Anti-Ship Missile					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
NSM Launcher and WCS Development	C/CPFF	Raytheon Company : Tucson, AZ	18.607	16.744	Nov 2021	6.055	Nov 2022	0.000		-		0.000	0.000	41.406	-
PRM - Launcher	SS/FFP	Raytheon Company : Tucson, AZ	0.000	18.493	Nov 2021	0.000		0.000		-		0.000	0.000	18.493	-
PRM - WCS	SS/FFP	Raytheon Company : Tucson, AZ	0.000	3.947	Nov 2021	0.000		0.000		-		0.000	0.000	3.947	-
Platoon Level Planning	C/CPFF	Raytheon Company : Tucson, AZ	0.000	9.142	Nov 2021	5.912	Nov 2022	0.000		-		0.000	0.000	15.054	-
Rogue-Fires Carrier Development	SS/FFP	Oshkosh : Oshkosh, WI	2.041	5.481	Dec 2021	3.779	Nov 2022	0.000		-		0.000	0.000	11.301	-
PRM - Carrier	SS/FFP	Oshkosh : Oshkosh, WI	0.000	10.749	Feb 2022	0.000		0.000		-		0.000	0.000	10.749	-
PRM - Leader Kit	C/FFP	Oshkosh : Oshkosh, WI	0.000	2.642	Feb 2022	0.000		0.000		-		0.000	0.000	2.642	-
PRM - Re-Supply	TBD	TBD : TBD	0.000	1.012	Jan 2022	0.000		0.000		-		0.000	0.000	1.012	-
Tactical Comm Adapter	WR	NSWC-DD : Dahlgren, VA	0.650	0.857	Nov 2021	0.000		0.000		-		0.000	0.000	1.507	-
ECP - Communications	C/CPFF	Various : Various : Various : Various	0.000	0.000		0.000		22.884	Nov 2023	-		22.884	0.000	22.884	-
ECP - Navigation	C/CPFF	Various : Various : Various : Various	0.000	0.000		0.000		2.802	Nov 2023	-		2.802	0.000	2.802	-
ECP - Resupply	C/CPFF	Raytheon Company : Tucson, AZ	0.000	0.000		0.000		1.889	Nov 2023	-		1.889	0.000	1.889	-
Subtotal			21.298	69.067		15.746		27.575		-		27.575	0.000	133.686	N/A
Remarks The net increase from FY 2023 to FY 2024 reflects the transition from development and test into production and the initiation of Engineering Change Proposals (ECPs). FY 2024 focuses on capability enhancement of the NMESIS launcher/WCS and the ROGUE-Fires Carrier/Leader Kit through Engineering Change Proposals to allow for future growth within the fielded MMSL batteries through simultaneous fire control of multiple launchers by a single section and increased capabilities for navigation and product support.															

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0605514M / GROUND BASED ANTI-SH IP MISSILE				Project (Number/Name) 6637 / Ground Based Anti-Ship Missile					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Safety	WR	MCSC : Stafford, VA	0.207	0.207	Dec 2021	0.213	Nov 2022	0.072	Nov 2023	-		0.072	0.427	1.126	-
Cybersecurity/IA	WR	NSWC : Indian Head, MD	0.035	0.148	Dec 2021	0.153	Nov 2022	0.051	Nov 2023	-		0.051	0.306	0.693	-
Management and Prof. Services	Various	MCSC : various	0.247	0.126	Jan 2022	0.129	Nov 2022	0.043	Nov 2023	-		0.043	0.356	0.901	-
Subtotal			0.489	0.481		0.495		0.166		-		0.166	1.089	2.720	N/A
Remarks															
The decrease from FY 2023 to FY 2024 reflects the transition into production.															
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	Various	various : various	5.045	25.576	Dec 2021	16.851	Nov 2022	0.000	Nov 2023	-		0.000	0.000	47.472	-
Operational Test & Evaluation (OT&E)	Various	various : various	1.262	3.491	Dec 2021	9.852	Nov 2022	8.494	Nov 2023	-		8.494	0.000	23.099	-
Subtotal			6.307	29.067		26.703		8.494		-		8.494	0.000	70.571	N/A
Remarks															
The decrease from FY 2023 to FY 2024 reflects the transition from development and test into production. FY 2023 Operational Testing reflects the start of NET and the IOT&E GFT. FY 2024 Operational Testing reflects the completion of NET and IOT&E efforts including ballistic testing.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
GBASM Travel	Various	Various : Various	0.100	0.147	Dec 2021	0.146	Nov 2022	0.148	Nov 2023	-		0.148	Continuing	Continuing	Continuing
Subtotal			0.100	0.147		0.146		0.148		-		0.148	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy											Date: March 2023				
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0605514M / GROUND BASED ANTI-SH IP MISSILE					Project (Number/Name) 6637 / Ground Based Anti-Ship Missile					
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			28.194	98.762		43.090		36.383		-		36.383	Continuing	Continuing	N/A

Remarks

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PE 0605514M: *GROUND BASED ANTI-SHIP MISSILE*
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IP MISSILE

6637 / Ground Based Anti-Ship Missile



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605514M / GROUND BASED ANTI-SHIP MISSILE	Project (Number/Name) 6637 / Ground Based Anti-Ship Missile	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 6637				
Launcher PRM Contract Award	1	2022	1	2022
Carrier PRM Contract Award	2	2022	2	2022
Operational Assesment (OA)	3	2022	3	2022
Milestone C	4	2023	4	2023
IOT&E	2	2023	3	2024

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0605516M / LONG RANGE FIRES							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	54.373	85.073	36.693	36.763	-	36.763	3.921	2.234	0.000	0.000	0.000	219.057
6638: Long Range Fires	54.373	85.073	36.693	36.763	-	36.763	3.921	2.234	0.000	0.000	0.000	219.057

A. Mission Description and Budget Item Justification

Consistent with the National Defense Strategy direction to increase capacity of long-range, precision weapons, the Long Range Fire (LRF) capability will provide Combatant Commanders with the ability to employ an agile, mobile, land-based system, capable of launching Tomahawk cruise missiles to complement surface and sub-surface launched missiles. The Marine Corps plans to incorporate three Long-Range Missile batteries into the Fleet Marine Force starting in FY 2025. The LRF weapon system will consist of a ROGUE-Fires carrier (same design as the Marine Corps NMESIS carrier), integrated with a single cell MK-41 vertical launch system launcher (a similar configuration to those employed by the US Navy) for the employment of a encanistered Tomahawk missile, and Tactical Tomahawk Weapons Control System.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	88.479	36.693	22.071	-	22.071
Current President's Budget	85.073	36.693	36.763	-	36.763
Total Adjustments	-3.406	0.000	14.692	-	14.692
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.406	0.000			
• Program Adjustments	0.000	0.000	14.692	-	14.692
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000

Change Summary Explanation

The net increase of \$0.070M from FY 2023 to FY 2024 reflects a decrease in launcher and Tactical Tomahawk Weapons Control System (TTWCs) development and increase in operational testing for the Joint Guided Flight Test (JFT).

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0605516M / LONG RANGE FIRES				Project (Number/Name) 6638 / Long Range Fires			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
6638: Long Range Fires	54.373	85.073	36.693	36.763	-	36.763	3.921	2.234	0.000	0.000	0.000	219.057
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY 2023, LRF continued Tactical Tomahawk Weapons Control System (TTWCS) software development efforts, initiated an Extended User Evaluation (EUE), initiated mobility testing, and began an Operation Assessment.

In FY 2024, LRF continues EUE and mobility testing as well as conducting Shipboard Suitability Testing (SST), Electromagnetic Environmental Effects (E3), signature testing, and a Joint Flight Test with the Navy.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: 6638 Long Range Fires	85.073	36.693	36.763	0.000	36.763
Articles:	-	-	-	-	-
FY 2023 Plans: - Continued launcher and carrier development to incorporate test fixes as well as complete analysis for training, cyber, and safety - Continued development of the reload/resupply system - Continued development and testing of the TTWCS modifications to enable ground launch capabilities - Initiated EUE - Conducted Operational Assessment (OA) - Initiated mobility testing for launcher, reload/resupply, and C2 systems - Began preparations for Ship Suitability Testing (SST)					
FY 2024 Base Plans: - Continue launcher and carrier development to incorporate test fixes - Continue development and testing of the reload/resupply system - Continue EUE - Conduct E3 and signature testing - Conduct SST - Conduct Joint Guided Flight Test (JFT) in coordination with the US Navy - Conduct mobility and transportability testing for launcher, reload/resupply, and C2 systems					
FY 2024 OCO Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0605516M / <i>LONG RANGE FIRES</i>		Project (Number/Name) 6638 / <i>Long Range Fires</i>	

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A					
<i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> The net increase of \$0.070M from FY 2023 to FY 2024 reflects a decrease in launcher and TTWCs development and increase in operational testing for the JFT.					
Accomplishments/Planned Programs Subtotals	85.073	36.693	36.763	0.000	36.763

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• PMC/2212: <i>Artillery Weapons System</i>	221.347	143.808	165.268	-	165.268	302.261	361.454	296.097	163.386	Continuing	Continuing
• PMC/2101: <i>Tomahawk</i>	0.000	42.958	105.192	-	105.192	115.045	142.260	6.219	2.449	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Long Range Fires (LRF) program will support land and future maritime strike requirements and addresses capability gaps defined in the Joint Requirements Oversight Council approved Ground Based Anti-Ship Missile initial capability document. The system combines a ROGUE-Fires carrier integrated with a single cell MK41 Vertical Launching System (VLS) launcher and the necessary fire control systems. LRF was designated a Program of Record in September 2021, with a Milestone B in 3rd quarter FY 2022 and Milestone C in FY 2025. The Marine Corps is following a system of systems approach with major elements of LRF leveraged from existing Navy and Marine Corps programs. These include the Tomahawk missile, TTWCS, and VLS Launcher electronics. The Marine Corps program is focused on maturing the single cell launcher configuration, carrier, command and control system and resupply system to provide the Marine Corps an effective, sustainable expeditionary capability.

There are 6 major subsystems:

1) Launcher - The Marine Corps conducted a competitive source selection for development of the prototypes in FY 2021 to be used in FY 2022 developmental testing and a production contract awarded in FY 2022 for the PRMs needed for IOT&E in FY 2025.

2) Carrier - The ROGUE-Fires carrier was developed under a competitively awarded contract under the NMESIS program. A single production contract covers procurement of all carriers for both NMESIS and LRF starting in FY 2022.

3) TTWCS - The Navy is incorporating Army and Marine Corps ground requirements into the next TTWCS software baseline to create a common baseline for all services. As a result, all TTWCS contracting is being conducted and managed by the Navy as part of the TTWCS Program. TTWCS hardware is also purchased via the Navy.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605516M / LONG RANGE FIRES	Project (Number/Name) 6638 / Long Range Fires
<p>4) Tomahawk Missile - All missile procurements are managed through the Navy under their contracts.</p> <p>5) Reload/Resupply System - System design and test will be conducted in conjunction with the launcher development and production contract planned for incremental delivery in FY 2022 through FY 2024.</p> <p>6) C2 System - System design and test will be conducted in conjunction with the launcher development and production contract planned for incremental delivery in FY 2022 through FY 2024.</p> <p>Initial sustainment will rely on Contractor Logistics Support (CLS) for maintenance. Training on TTWCS will use the Navy courses and facilities.</p> <p>The Marine Corps is leveraging other Service systems by using the existing Tomahawk missile along with MK41 launcher sub-systems, and the TTWCS. This solution is focused on reducing developmental risk through the reuse of qualified systems and early retirement of risks. The TTWCS modifications are being developed as a collaborative effort with the Army and Navy to generate a single TTWCS baseline for all services.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

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R-1 Program Element (Number/Name)

PE 0605516M / LONG RANGE FIRES

Project (Number/Name)

6638 / Long Range Fires

Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Launcher Development	C/CPFF	DMEA : Lockheed Martin	12.454	9.741	Dec 2021	7.253	Jan 2023	6.043	Jan 2024	-		6.043	0.000	35.491	-
Prototype Launcher	C/CPFF	DMEA : Lockheed Martin	3.800	0.000		0.000		0.000		-		0.000	0.000	3.800	-
PRM Launcher	SS/CPFF	DMEA : Lockheed Martin	0.000	11.605	Jun 2022	0.000		0.000		-		0.000	0.000	11.605	-
Carrier Development	C/CPFF	Oshkosh : Oshkosh, WI	12.967	6.471	Dec 2021	0.467	Jan 2023	0.476	Jan 2024	-		0.476	0.000	20.381	-
Prototype Carrier	C/CPFF	Oshkosh : Oshkosh, WI	2.634	0.000	Oct 2022	0.000		0.000		-		0.000	0.000	2.634	-
PRM Carrier	SS/CPFF	Oshkosh : Oshkosh, WI	0.000	6.449	Oct 2022	0.000		0.000		-		0.000	0.000	6.449	-
Leader Kit	SS/CPFF	Oshkosh, WI : Oshkosh, WI	1.377	0.850	Oct 2022	0.000		0.000		-		0.000	0.000	2.227	-
Re-Supply System Development	C/CPFF	DMEA : Lockheed Martin	0.000	2.982	Feb 2022	1.548	Jan 2023	2.123	Jan 2024	-		2.123	0.000	6.653	-
TTWCS Development	C/CPFF	NAVAIR : Various	15.556	23.159	Dec 2021	10.765	Dec 2022	8.677	Dec 2023	-		8.677	0.000	58.157	-
TTWCS Hardware	C/CPFF	NAVAIR : Various	1.500	0.000		0.000		0.000		-		0.000	0.000	1.500	-
Subtotal			50.288	61.257		20.033		17.319		-		17.319	0.000	148.897	N/A

Remarks

The decrease from FY 2023 to FY 2024 reflects a reduction in developmental efforts as the program shifts to testing.

Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Safety and Cyber Security/ IA	C/BA	various : various	0.661	1.327	Dec 2021	1.352	Dec 2022	1.861	Dec 2023	-		1.861	0.000	5.201	-
Subtotal			0.661	1.327		1.352		1.861		-		1.861	0.000	5.201	N/A

Remarks

The increase from FY 2023 to FY 2024 reflects safety and cyber efforts needed for testing.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0605516M / LONG RANGE FIRES				Project (Number/Name) 6638 / Long Range Fires					
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	Various	Various : Various	3.281	10.736	Dec 2021	11.580	Dec 2022	11.841	Dec 2023	-		11.841	0.000	37.438	-
Operational Test & Evaluation (OT&E)	Various	Various : Various	0.095	11.673	Dec 2021	3.628	Dec 2022	5.642	Dec 2023	-		5.642	0.000	21.038	-
Subtotal			3.376	22.409		15.208		17.483		-		17.483	0.000	58.476	N/A
Remarks															
The increase from FY 2023 to FY 2024 is due to an increase of additional operational testing including the JFT. FY 2024 developmental testing includes: EUE and mobility testing, SST, E3, and signature testing.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	WR	MCSC : MCSC	0.048	0.080	Oct 2021	0.100	Nov 2022	0.100	Nov 2023	-		0.100	0.000	0.328	-
Subtotal			0.048	0.080		0.100		0.100		-		0.100	0.000	0.328	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			54.373	85.073		36.693		36.763		-		36.763	0.000	212.902	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

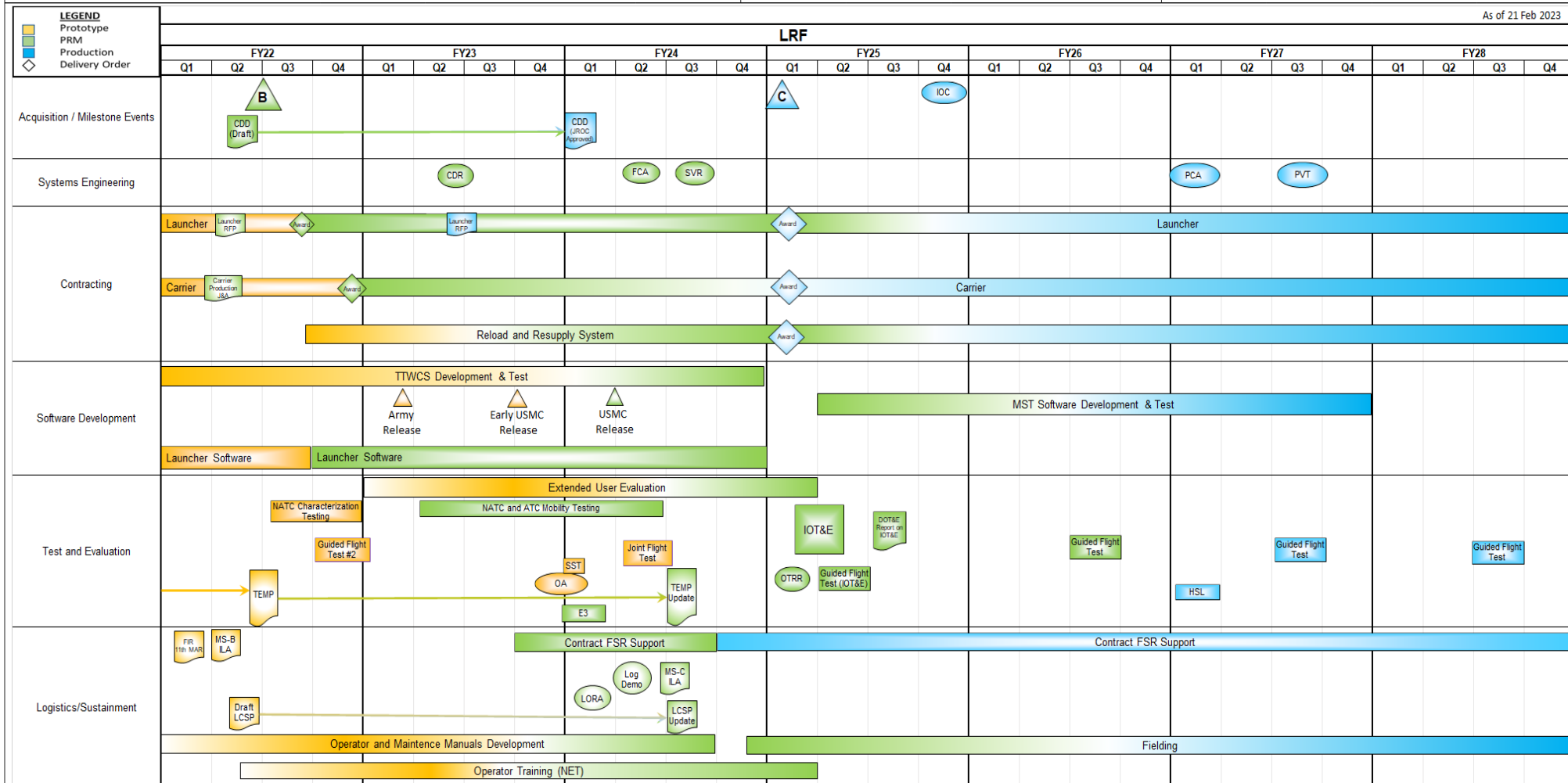
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R-1 Program Element (Number/Name)

PE 0605516M / LONG RANGE FIRES

Project (Number/Name)

6638 / Long Range Fires



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605516M / LONG RANGE FIRES	Project (Number/Name) 6638 / Long Range Fires	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 6638				
Milestone B	3	2022	3	2022
Launcher PRM Contract Award	3	2022	3	2022
Carrier PRM Contract Award	1	2023	1	2023
Operational Assesment (OA)	4	2023	1	2024
Extended User Evaluation (EUE)	1	2023	1	2025
Milestone C	1	2025	1	2025
IOT&E	1	2025	2	2025

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0605518N / CONVENTIONAL PROMPT STRIKE (CPS)							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	742.521	1,282.595	1,230.041	901.064	-	901.064	1,065.999	913.528	642.285	486.113	Continuing	Continuing
3334: Conventional Prompt Strike (CPS)	742.521	1,277.768	1,205.041	901.064	-	901.064	1,065.999	913.528	642.285	486.113	Continuing	Continuing
9999: Congressional Adds	0.000	4.827	25.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	29.827
Program MDAP/MAIS Code:												
Project MDAP/MAIS Code(s): 197												
A. Mission Description and Budget Item Justification												
Conventional Prompt Strike (CPS) capability will enable precise and timely strike in contested environments across multiple platforms. In coordination with the Army, the Navy CPS Program is designing a common All Up Round (AUR) comprised of a Common Hypersonic Glide Body (C-HGB) and a 34.5" two-stage booster. The Navy is responsible for C-HGB design, while the Army leads C-HGB production. The Navy will design, develop, and produce the missile booster, and will integrate the missile booster with the C-HGB. Each service will use the resulting common hypersonic missile while developing individual weapon control systems and launchers tailored for launch from sea or land. Development efforts under this program element lead to a weapon system capability that: (1) is non-ballistic over the majority of the flight path; (2) controls stage drop; (3) provides positive control and precision accuracy from launch to impact; (4) provides adequate cross-range/maneuverability to avoid over-flight issues; (5) provides prompt lethal effects on targets; and (6) is man-safe and deployable for surface and submerged platforms.												
B. Program Change Summary (\$ in Millions)				FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total				
Previous President's Budget				1,325.232	1,205.041	1,286.159	-	1,286.159				
Current President's Budget				1,282.595	1,230.041	901.064	-	901.064				
Total Adjustments				-42.637	25.000	-385.095	-	-385.095				
• Congressional General Reductions				-	-							
• Congressional Directed Reductions				-	-							
• Congressional Rescissions				-	-							
• Congressional Adds				-	25.000							
• Congressional Directed Transfers				-	-							
• Reprogrammings				-	-							
• SBIR/STTR Transfer				-42.637	0.000							
• Program Adjustments				0.000	0.000	-410.947	-	-410.947				
• Rate/Misc Adjustments				0.000	0.000	25.852	-	25.852				
Congressional Add Details (\$ in Millions, and Includes General Reductions)										FY 2022	FY 2023	
Project: 9999: Congressional Adds												

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023	
Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>		R-1 Program Element (Number/Name) PE 0605518N / <i>CONVENTIONAL PROMPT STRIKE (CPS)</i>	
<u>Congressional Add Details (\$ in Millions, and Includes General Reductions)</u>		FY 2022	FY 2023
Congressional Add: <i>Cross-service hypersonic testing capabilities through adv. concepts tech. eval.</i>		4.827	0.000
Congressional Add: <i>Flight tests</i>		0.000	25.000
Congressional Add Subtotals for Project: 9999		4.827	25.000
Congressional Add Totals for all Projects		4.827	25.000
<u>Change Summary Explanation</u> Past Budget Structure Changes: - Prior to FY 2022, CPS budgets showed all Science and Technology / Advanced Capabilities (STAC) efforts under the Weapon System Integration budget category. The CPS program broke out these costs into their own budget category in order to provide greater transparency. Program Changes: FY 2024 Program Adjustments: - Adjustment of \$410.947M realigned funding to appropriate appropriations. \$49.500M of funding realigned to RD TEN PE 0204202N for DDG Integration on ZUMWALT Class, \$40.000M of funding realigned to SCN LI 2013 for SSN integration in VIRGINIA Class submarines, \$33.700M realigned to OPN LI 0947 for DDG 1000 Class Support Equipment, \$6.650M of funding realigned to MCN LI 64482044 for Planning and Design for Conventional Long Weapon Storage; CPS Maintenance, Operations, and Storage; and Test facilities (Yorktown and Pearl Harbor), and \$281.097M of funding realigned to WPN LI 1160 for procurement of All Up Rounds. Note for Quantity of RDT&E Articles: - The profile for Quantity of RDT&E Articles reflects the year procurements are initiated for each unit. Efforts for each RDT&E asset are incrementally funded across multiple fiscal years. The total quantity reflects AUR+C, flight test assets, high fidelity test assets, and high fidelity simulators.			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0605518N / CONVENTIONAL PROMPT STRIKE (CPS)				Project (Number/Name) 3334 / Conventional Prompt Strike (CPS)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3334: Conventional Prompt Strike (CPS)	742.521	1,277.768	1,205.041	901.064	-	901.064	1,065.999	913.528	642.285	486.113	Continuing	Continuing
Quantity of RDT&E Articles		6	5	2	-	2	2	2	4	2		
Project MDAP/MAIS Code: 197												

A. Mission Description and Budget Item Justification

The Conventional Prompt Strike (CPS) Weapon System will deliver a hypersonic conventional offensive strike capability through a depressed boost-glide trajectory to prosecute deep-inland, time-critical, soft and medium-hardened targets in contested environments. The CPS Weapon System will enhance U.S. conventional power projection through longer range, shorter time of flight, and higher survivability against enemy defenses compared to current capabilities. The CPS weapon system or major elements of the weapon system will be deployed onboard multiple launch platforms. The CPS program is a joint effort between services. Specifically, the Navy and Army are collaborating to design and deliver a common All Up Round (AUR) in accordance with an inter-service Memorandum of Agreement. To meet Navy requirements and Army priorities, the Navy is designing and developing the Common Hypersonic Glide Body (C-HGB) and 34.5" Booster, and integrating the C-HGB with the 34.5" Booster to create a common AUR. The Army is responsible for production of the Navy-designed C-HGB.

To enable weapon system integration to meet Navy mission requirements, near-term design, development, and experimentation are required across the weapon system's components. Design and development efforts will focus on boosters; thermal protection systems; navigation, guidance and control systems; capability enhancements; payload modules; weapon control systems and interfaces to existing fire control systems; support equipment; and launcher systems. Component and subsystem technology maturity will be demonstrated, and risk reduction accomplished, through Modeling and Simulation (M&S) assessments, Hardware-in-the-Loop (HWIL) / Software-in-the-Loop (SWIL) testing, ground-based testing, in-air and underwater launch testing, and flight tests. Furthermore, with each platform deployment, risk continues to be reduced for weapon subsystems and components until prototyping efforts culminate in an initial operational Blk V VIRGINIA Class submarine weapon system capability. The program will capitalize on commonality between platform implementations.

CPS supports the National Defense Strategy by supporting modernization initiatives for hypersonic technologies and enabling a more lethal force. The CPS program plan: (1) Provides rapid delivery of capability through multiple acquisition increments and configurations; and (2) Provides flexibility to allow for additional capability phases as the weapon system and warfighter requirements evolve. In order to meet current Top Level Requirements (TLR) and future warfighter needs, the program has developed a Technology Insertion (TI) strategy with pre-planned insertion points to enable the program to regularly insert baseline upgrades and mature advanced technologies to support capability improvements into the Navy and Army systems. To support the TI Strategy, the program has developed a Science and Technology / Advanced Capability (STAC) process to mature advanced technology and fill Navy and Army warfighting capability gaps to ensure continued battlefield dominance.

The FY 2024 budget exhibit reflects no change to cost categories shown in FY 2023. However, in the FY 2023 exhibit all STAC efforts previously under Weapon System Integration budget category were broken out into their own budget category to provide a greater level of detail. These categories reflect how the CPS Program Office currently structures and manages its major contracts and efforts while providing high fidelity financial data for each work performer. Budget exhibit data is based on

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0605518N I CONVENTIONAL PROMPT STRIKE (CPS)		Project (Number/Name) 3334 I Conventional Prompt Strike (CPS)		
annual task planning efforts to evaluate current and future year budget requirements. This cost data is continuously updated based on actual execution data and prime contractors negotiations.						
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Weapon System Integration		160.373	100.682	88.451	0.000	88.451
Articles:		-	-	-	-	-
Description: The Weapon Systems Integration (WSI) category accommodates all efforts associated with systems engineering, logistics, and program management support for the Block 1 Weapon System (WS) and future TIs.						
FY 2023 Plans:						
- Continue the development and build of Shipping and Storage Container (SSC) test articles in support of Insensitive Munitions/ Hazardous Classification (IM/HC) testing. The test SSCs will inform the final design of the SSC for transportation and storage of fielded AUR+Cs.						
- Continue support and development of the maintenance concepts, storage, loading and handling, transportation, supply support, and training for the CPS weapons system (WS).						
- Begin development of the CPS WS Capabilities Development Document (CDD).						
- Continue systems engineering efforts for the assured performance, accuracy, integration, and compatibility of the CPS system and related auxiliary systems by establishing system-level requirements; defining interfaces between subsystems, launch platforms, and facilities; and initiating policy/design tenets for overall system performance and interoperability.						
- Continue upgrading the WS to include establishing system and sub-system level requirements, and initiating policy and program level design tenets to ensure overall system performance and interoperability. Continue defining and refining with Prime and all Subcontractors the interfaces between and within the AUR, Canister, and Weapon Control System and Launch platforms.						
- Maintain and grow the classified digital infrastructure across industry and government sites to enable coordination, rapid development, and communication between multiple locations.						

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Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0605518N / CONVENTIONAL PROMPT STRIKE (CPS)		Project (Number/Name) 3334 / Conventional Prompt Strike (CPS)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Continue efforts to expand industrial base capacity to prepare for increased AUR and Advance Payload Module (APM) production needed to support delivery of 24 AURs and 5 APMs per year.</p> <p>- Execute Schedule Management, Risk Management, Safety Management, Software Engineering, Program Protection, cybersecurity, and quality assurance in support of FY 2023 activities and future CPS Program milestones.</p> <p>FY 2024 Base Plans:</p> <p>- Finalize builds of Shipping and Storage Container (SSC) test articles to support Insensitive Munitions/ Hazardous Classification (IM/HC) testing.</p> <p>- Delivery of the first tactical SSC in Q4 FY 2024.</p> <p>- Continue support and development of the maintenance concepts, storage, loading and handling, transportation, supply support, and training for the CPS WS.</p> <p>- Continue development of the CPS WS CDD.</p> <p>- Continue systems engineering efforts for the assured performance, accuracy, integration, and compatibility of the CPS system and related auxiliary systems by establishing system-level requirements; defining interfaces between subsystems, launch platforms, and facilities; and developing policy/design tenets to ensure overall system performance and interoperability.</p> <p>- Continue upgrading the WS to include establishing system and sub-system level requirements, and developing policy and program level design tenets to ensure overall system performance and interoperability. Continue defining and refining with Prime and all Subcontractors the interfaces between and within the AUR, Canister, and Weapon Control System and Launch platforms.</p> <p>- Maintain and grow the classified digital infrastructure across industry and government sites to enable coordination, rapid development, and communication between multiple locations.</p> <p>- Complete efforts to expand industrial base capacity to prepare for increased AUR and Advance Payload Module (APM) production needed to support delivery of 24 AURs and 5 APMs per year.</p>						

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Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0605518N / CONVENTIONAL PROMPT STRIKE (CPS)		Project (Number/Name) 3334 / Conventional Prompt Strike (CPS)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Implement digital engineering-focused systems engineering processes such as ConOps development, requirements development and management, interface control, and verification and validation (V&V) for classified digital infrastructure for all relevant CPS design agents and stakeholders. Connect modeling and simulation, Single Shot Probability of Kill (SSPk) tool, physics based models, hardware in the loop (HWIL) and software development efforts across the CPS enterprise to capture CPS weapon system logical, physical, and functional behavior in a digital environment.</p> <p>- Execute Schedule Management, Risk Management, Safety Management, Software Engineering, Program Protection, Cybersecurity, and Quality Assurance in support of FY 2024 activities and future CPS Program milestones.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The FY 2023 to FY 2024 decrease of \$12.231M is due to industrial base capacity expansion efforts completing in FY 2024.</p>						
<p>Title: Flight Subsystem</p> <p>Articles:</p> <p>Description: The Flight Subsystem category accommodates all efforts for Blk 1 and future TIs associated with the Missile Body and C-HGB, design, development, fabrication, test, and transition to production; development and test of navigation, guidance, and control flight software; Thermal Protection System (TPS) efforts; and hardware procurements for Insensitive Munitions (IM) testing.</p> <p>FY 2023 Plans:</p> <p>- Continue the Blk 1 AUR effort as it transitions from component qualification, software verification and validation (V&V) testing, Weapon System integration testing, and initial testing to final flight testing and Army deployment. Begin AUR Hazard of Electromagnetic Radiation to Ordnance (HERO) testing, and system-level Electromagnetic Interference (EMI), Electromagnetic Compatibility (EMC), and Environmental testing.</p> <p>- Continue the TI-22 AUR effort as it transitions from final design to component qualification testing, flight software V&V testing, and weapon system integration testing.</p>		525.687 -	587.573 -	321.674 -	0.000 -	321.674 -

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<div>- Continue the Blk 1 AUR system level integration testing and commence TI-22 subsystem level AUR integration testing with Navy Weapons Control Systems via Test Lines (TL-1 and TL-2).</div> <div>- Continue Government National Team efforts to design, develop, fabricate, and test C-HGB and missile body flight articles for JFC 3, 4, 5, and 6. Efforts focus on the development and integration of individual missile components including the C-HGB and the missile body, and on the overall integration of the missile into a weapon system.</div> <div>- Complete the design, development, fabrication, and testing of two ITVs to support In-Air Launch (IAL) testing.</div> <div>- Continue the design, development, fabrication, and testing of two ITVs to support Underwater Launch (UWL) testing.</div> <div>- Continue fabrication of test articles for IM/HC test series in support of Navy deployment. Complete C-HGB Fast Cook Off IM/HC testing.</div> <div>- Continue design, development, fabrication, and testing of five TI-22 AURSIMGs in support of assembly proofing, and Box Launcher and ZUMWALT-Class DDG integration testing.</div> <div>- Begin glide body and missile body procurements of long lead time material associated with the first three ZUMWALT-Class assets.</div> <div>- Continue the support of flight system software, including the development of requirements and performance metrics, hardware integration and test, verification and validation testing, and HWIL simulation support for Blk 1 completion and TI-22 maturation.</div> <div>- Continue analytical support for thermo-structural, computational fluid dynamics, roll prescription analysis, modeling & simulation, and flight worthiness analysis, as well as a Design of Experiments to gain a physics-based understanding on constituent TPS materials and processing to select cost-effective TPS materials with reduced production times.</div>					

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)				FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Continue the TI-24 AUR effort as it transitions from requirements and architecture definition to preliminary design.</p> <p>FY 2024 Base Plans:</p> <p>- Prepare Blk 1 AUR asset for JFC-4 by completing component qualification, software V&V testing, Weapon System integration testing, and initial testing. Complete AUR HERO testing, and system-level EMI, EMC, and Environmental testing.</p> <p>- Continue the TI-22 AUR effort as it transitions from final design to component qualification testing, flight software V&V testing, and weapon system integration testing.</p> <p>- Complete the Blk 1 AUR system level integration testing and TI-22 subsystem level AUR integration testing with Navy Weapons Control Systems via Test Lines (TL-1 and TL-2).</p> <p>- Continue Government National Team efforts to design, develop, fabricate, and test C-HGB and missile body flight articles for JFC 4, 5, 6, 7, and 8. Efforts focused on the development and integration of individual missile components including the C- HGB and the missile body, and on the overall integration of the missile into a weapon system.</p> <p>- Continue the design, development, fabrication, and testing of two ITVs to support UWL testing.</p> <p>- Continue fabrication of test articles for IM/HC test series in support of Navy deployment. Complete C-HGB bullet impact and fragment impact IM/HC testing, C-HGB slow cook off, First Stage Solid Rocket Motor fast cook off, and 40' vertical drop testing.</p> <p>- Complete first TI-22 AURSIM to support assembly proofing and Box Launcher integration testing. Continue design, development, fabrication, and testing of four TI-22 AURSIMs for assembly proofing, and Box Launcher and ZUMWALT-Class DDG integration testing.</p> <p>- Continue glide body and missile body procurements, fabrication, and testing of the first three ZUMWALT-Class assets.</p>								

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Continue support of flight system software, including development of requirements and performance metrics, hardware integration and test, verification and validation testing, and HWIL simulation support for Blk 1 completion and TI-22 maturation.</p> <p>- Continue analytical support for thermo-structural, computational fluid dynamics, roll prescription analysis, modeling & simulation, and flight worthiness analysis, as well as a Design of Experiments to gain a physics-based understanding on constituent TPS materials, then selecting cost-effective TPS materials with reduced production times.</p> <p>- Continue the TI-24 AUR effort as it transitions from preliminary design to final design.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The FY 2023 to FY 2024 decrease of \$265.899M is due to realigning funds to WPN for AUR+Cs previously programmed in RDT&E.</p>						
<p>Title: Platform Integration</p> <p>Articles:</p> <p>Description: The Platform Integration category accommodates all non-recurring engineering (NRE) efforts associated with CPS payload hosting on Block V VIRGINIA platforms. This encompasses all efforts required to develop and test a launcher system including: modification of and maintaining the IAL test facility; conducting in-air launcher testing; construction of the UWL test facility and fabrication of major UWL specialty equipment for outfitting of the UWL test facility in sequence with construction to facilitate testing planned in FY 2025; design, development, test, and certification of Pier Side Support Equipment (PSSE) to on-load and off-load Advanced Payload Modules (APMs), AUR+Cs, and fired/expended canisters; design, development, and testing of prototype APM; and host platform system modifications. The effort also includes development and test of the Weapon Control System (WCS) including: prototype hardware and software in support of range based test launches and early integration demonstration on ZUMWALT, software and hardware for support mission planning (on-and off-board), and hardware and software to ensure host platform system modifications. The design, development, and test of WCS elements, APM, and PSSE must support Army fielding and ZUMWALT Class DDG integration timelines, as applicable.</p>		459.012 -	362.375 -	293.064 -	0.000 -	293.064 -

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
FY 2023 Plans: - Restart non-recurring engineering (NRE) efforts required to modify the Block V VIRGINIA Class design to support the integration of CPS. - Continue construction of UWL test facility and fabrication of major UWL specialty equipment for integration during construction (outfitting). Facility is being constructed by NAVFAC under 10 USC 2353 authority. - Deliver final Block I mission planning capability in support of initial Army deployment. - Continue design and development of the WCS software and sub-system level testing. - Continue development of algorithms for trajectory generation and the Mission Data Load generator for use in CPS Mission Planning, both at geographic combatant commanders through integration into the Theater Mission Planning Center, and onboard platforms as part of the WCS. Perform requirements refinement, CPS Mission Planning System Requirements Review, and software design, development, and integration. - Continue design, development, and testing of prototype APM. - Continue design and fabrication of PSSE. - Complete fabrication, delivery, and initial test of the Box Launcher test asset at the In-Air Launch test facility in preparation for cold-gas launch hypersonic missile test, JFC-4, in Q2 FY 2024.					
FY 2024 Base Plans: - Continue non-recurring engineering (NRE) efforts required to modify the Block V VIRGINIA Class design to support the integration of CPS. - Initiate outfitting during new construction shipyard period for payload control cables and launcher-specific support equipment for CPS integration on VIRGINIA Class hulls. - Continue In-Air Launch test activities at China Lake using prototype APM in support of ZUMWALT deployment.					

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Continue construction of UWL test facility and continue fabrication/installation of major UWL specialty equipment for integration during construction (outfitting). Facility will be constructed by NAVFAC under 10 USC 2353 authority.</p> <p>- Delivery of first PSSE articles in support of prototype APM test events. Continued fabrication of PSSE.</p> <p>- Continue development of CPS WCS and Mission Planning capability to support ZUMWALT and VIRGINIA deployment.</p> <p>- Continue development of algorithms for trajectory generation and the Mission Data Load generator for use in CPS Mission Planning, both at geographic combatant commanders through integration into the Theater Mission Planning Center, and onboard platforms as part of the WCS. Perform requirements refinement, CPS Mission Planning System Requirements Review, and software design, development, and integration.</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The FY 2023 to FY 2024 decrease of \$69.311M is due to platform agnostic CPS efforts transitioning to ZUMWALT platform-specific efforts, which are funded by the ZUMWALT program office. Additionally, UWL test facility construction efforts transition from major construction to purchase and installation of specialty test equipment in FY 2024.</p>						
<p>Title: Test & Evaluation</p> <p>Articles:</p> <p>Description: The Testing and Evaluation (T&E) category provides system level test plans and the execution of JFC test events. The Test and Evaluation category additionally supports test execution demonstrating platform integration of AUR Canister, APM, and WCS capabilities.</p> <p>FY 2023 Plans: - Execute JFC-2 and JFC-3 flight tests. T&E efforts support launch operations and test planning to include test equipment, assembly tooling, handling hardware, relevant subcomponent ground testing, pathfinder activities, and field activity support. Upon test completion, efforts shift to data collection and analysis. JFC-3 demonstrates the final WS prototype configuration (Block I) that will be fielded in the Army's first battery.</p>		79.609 -	58.407 -	131.914 -	0.000 -	131.914 -

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<ul style="list-style-type: none"> - Continue test planning and reviews for further flight tests and evaluation, including JFC-2, JFC-3, JFC-4, JFC-5, and JFC-6. Two years in advance of the test event, the T&E program begins the test requirements analysis phase followed by initial and detailed planning phases, an execution readiness review, and finally a mission readiness review to ensure aspects of the test are ready to support commencing test count down. - Continue utilization of broad ocean area flight test data collection assets supporting JFC-3. Continue incremental upgrades of data collection assets to improve the ability to verify threshold lethality requirements. - Execute two solid rocket motor static fire tests to validate performance models. - Execute warhead live fire testing for maturation and certification of lethality models supporting CPS fielding with the Army's first Battery and ZUMWALT. <p><i>FY 2024 Base Plans:</i></p> <ul style="list-style-type: none"> - Execute JFC-4 and JFC-5 flight tests. T&E efforts support launch operations and test planning to include test equipment, assembly tooling, handling hardware, relevant subcomponent ground testing, pathfinder activities, and field activity support. Upon test completion, perform data collection and analysis. JFC-4 will demonstrate the first CPS Block I AUR launch using a capability representative cold-gas box launcher test asset. JFC-5 will be a two-shot campaign to demonstrate the cold-launch of the CPS TI-22 AUR in advance of ZUMWALT Class shipboard integration and installation. - Continue test planning and reviews for further flight tests and evaluation, including JFC-4, JFC-5, JFC-6, JFC-7, and JFC-8. Two years in advance of the test event, the T&E program will begin the test requirements analysis phase, followed by initial and detailed planning phases, an execution readiness review, and finally a mission readiness review to ensure aspects of the test are ready to support commencing test count down. - Continue utilization of broad ocean area flight test data collection assets, supporting JFC-4 and JFC-5. Continue incremental upgrades of data collection assets to improve the ability to verify threshold lethality requirements. 					

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)				FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
- Execute warhead live fire testing for maturation and certification of lethality models supporting CPS fielding to Army and Navy platforms. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: The FY 2023 to FY 2024 increase of \$73.507M is due to test execution costs that were previously cost-shared by the Army. FY 2024 is the first year that flight tests are fully funded by the Navy and will consist of three test launches (1 during JFC-4 and 2 during JFC-5).								
Title: Science and Technology / Advanced Capabilities (STAC) Articles: Description: The STAC budget category identifies, develops, tests, matures, and transitions new technologies and Weapon System capabilities to close Navy and Army warfighting gaps. The STAC program executes internal development and liaises with the broader DoD Science and Technology (S&T) community to identify emerging technologies, and then develops component, subsystem, or other capabilities needed to improve affordability, manage obsolescence, and increase the CPS weapon system's capabilities against existing and emerging threats. The STAC program consists of three supporting elements: 1) Technology and advanced capability identification and development 2) Technology maturation including component level experimental testing (wind tunnel, ground, sled, and flight) to demonstrate capability 3) Technology evaluations to validate readiness levels for transition into the Weapon System STAC focuses on those technologies that improve affordability, manage obsolescence, and increase CPS WS's capabilities against the following program Top Level Requirement (TLR) categories: 1) Priority targets; 2) Emerging threat environments; 3) Flight effectiveness; 4) Accuracy; and 5) Command, Control and Communications (C3) interoperability. Details are available at a higher classification level.				53.087 -	96.004 -	65.961 -	0.000 -	65.961 -

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)				FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>FY 2023 Plans:</p> <p>- Transition technologies and capabilities, such as advanced communications, planned for Technology Insertion - 22 (TI-22).</p> <p>- Continue to use modeling and simulation analysis to understand the CPS capabilities and gaps in affordability, lethality, survivability, performance envelope, and CONOPS.</p> <p>- Initiate affordability and obsolescence management initiatives, including the use of additive manufacturing to reduce costs and increase production performance of warheads and Thermal Protection Systems (TPS).</p> <p>- Initiate development of next generation warhead capability improvements to expand lethality against a broader set of targets. Details are available at a higher classification level.</p> <p>- Continue development and perform verification and performance testing for alternate navigation technologies to improve performance in identified threat environments. Details are available at a higher classification level.</p> <p>- Continue development of terminal sensors and perform verification and performance testing prior to design decision milestones. Details are available at a higher classification level.</p> <p>- Continue experimental testing for advanced capabilities using sounding rocket tests and initiate alternative experimental launch test capabilities leveraging the Multi-Service Advanced Capabilities for Hypersonics Test Bed (MACH-TB).</p> <p>FY 2024 Base Plans:</p> <p>- Submit technologies demonstrating technical and integration readiness and perform final technology demonstration prior to TI Final Design Review.</p> <p>- Continue to use modeling and simulation analysis to understand the CPS capabilities and gaps in lethality, survivability, performance envelope, and CONOPS.</p> <p>- Continue affordability and obsolescence management initiatives, including the use of additive manufacturing to reduce costs and increase production performance of warheads and TPSs.</p>								

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0605518N / <i>CONVENTIONAL PROMPT STRIKE (CPS)</i>		Project (Number/Name) 3334 / <i>Conventional Prompt Strike (CPS)</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>- Perform design maturation, prototyping, and testing of next generation warhead capability improvements to expand lethality against a broader set of targets. Details are available at a higher classification level.</p> <p>- Continue to develop alternate navigation technologies to improve performance in identified threat environments. Details are available at a higher classification level.</p> <p>- Continue development of terminal sensors and perform sensor integration and performance testing prior to production milestones. Details are available at a higher classification level.</p> <p>- Continue experimental testing for advanced capabilities using sounding rocket and perform full-scale experimental launch test capabilities leveraging the Multi-Service Advanced Capabilities for Hypersonics Test Bed (MACH-TB).</p> <p>FY 2024 OCO Plans: N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement: The FY 2023 to FY 2024 decrease of \$30.043M is due to shifting focus to affordability and obsolescence management and away from development of emergent advanced capabilities.</p>						
Accomplishments/Planned Programs Subtotals		1,277.768	1,205.041	901.064	0.000	901.064
C. Other Program Funding Summary (\$ in Millions) N/A						
Remarks						
D. Acquisition Strategy The Conventional Prompt Strike (CPS) program is a phased acquisition program currently in its Middle Tier of Acquisition (MTA) Rapid Prototyping phase of development for the baseline Navy CPS Weapon System, which also provides a common AUR for the Army's use in the Long Range Hypersonic Weapon (LRHW). System design, prototyping, and early fielding utilize the MTA, as authorized by Section 804 of the FY 2016 National Defense Authorization Act (NDAA) and amended in FY 2017 NDAA (codified at 10 U.S.C. sub sec 2302 note), with the goal of transitioning to a Major Capability Acquisition (MCA) at Milestone C. The Rapid Prototyping path of MTA provides for the use of innovative technologies to rapidly develop fieldable prototypes to demonstrate new capabilities and meet emerging military needs. The current CPS Rapid Prototyping Phase will demonstrate a hypersonic cold gas launched missile prototype capability by FY 2024. In furtherance of this objective, in FY 2023, the CPS program will demonstrate the prototype missile, will conduct testing to prove the launch system concept, and will continue to mature integration						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605518N / CONVENTIONAL PROMPT STRIKE (CPS)	Project (Number/Name) 3334 / Conventional Prompt Strike (CPS)
<p>objectives to support on-time Army deployment by the end of the FY and Navy integrated system demonstration in the following year. The next acquisition phase, MTA Rapid Fielding, will initiate in FY 2024 to support the ZUMWALT Class DDG deployment of the CPS system by FY 2025.</p> <p>In FY 2023, the CPS program continued the incremental funding of 3 flight test assets, 1 high fidelity test asset, and 5 high fidelity AUR simulators to be delivered in FY 2024. The CPS program also initiated the incremental funding of 3 AURs and 2 flight test assets by procuring long lead material.</p> <p>In FY 2024, the CPS program will continue the incremental funding for the remaining assembly, integration, and test of 3 AUR+Cs and 2 flight test assets to be delivered in FY 2025. The CPS program will also initiate the incremental funding of 1 flight test asset and 1 high fidelity AUR simulator.</p> <p>In FY 2023, the cost of an AUR+C is assessed at \$46.7M. An additional cost of \$4.7M is necessary to incorporate flight test components. High fidelity simulators and high fidelity test assets are assessed at a similar cost as flight test assets.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0605518N / CONVENTIONAL PROMPT STRIKE (CPS)				Project (Number/Name) 3334 / Conventional Prompt Strike (CPS)					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Flight Subsystem	MIPR	US Army Combat Capabilities Development Com : Picatinny Arsenal, NJ	22.660	0.000		0.000		0.000		-		0.000	0.000	22.660	-
Flight Subsystem	MIPR	US Army Combat Capabilities Aviation & Missile Cen : Huntsville, AL	0.163	13.137	Nov 2021	7.669	Nov 2022	4.834	Nov 2023	-		4.834	Continuing	Continuing	Continuing
Flight Subsystem	SS/CPFF	Draper : Boston, MA	14.551	1.784	Nov 2021	0.000		0.000		-		0.000	0.000	16.335	-
Flight Subsystem	C/BA	GSA : Arlington, VA	0.180	0.000		0.000		0.000		-		0.000	0.000	0.180	-
Flight Subsystem	MIPR	Lawrence Livermore National Laboratory : Livermore, CA	2.990	2.030	Dec 2021	3.192	Nov 2022	2.807	Nov 2023	-		2.807	Continuing	Continuing	Continuing
Flight Subsystem	SS/CPIF	Lockheed Martin Corporation : Denver, CO	226.361	439.925	Oct 2021	391.954	Oct 2022	215.544	Oct 2023	-		215.544	Continuing	Continuing	Continuing
Flight Subsystem	MIPR	National Security Agency : Ft. Meade, MD	0.138	0.000		0.000		0.000		-		0.000	0.000	0.138	-
Flight Subsystem	MIPR	Sandia National Laboratory : Albuquerque, NM	33.310	24.184	Dec 2021	30.643	Nov 2022	33.765	Nov 2023	-		33.765	Continuing	Continuing	Continuing
Flight Subsystem	MIPR	US Army Space and Missile Defense Command (SMDC) : Redstone Arsenal, AL	0.032	0.036	Oct 2021	14.202	Oct 2022	9.900	Oct 2023	-		9.900	Continuing	Continuing	Continuing
Flight Subsystem	MIPR	US Air Force Research Laboratory (USAFRL) : Wright-Patterson Air Force Base, OH	0.000	0.134	Oct 2021	0.000		0.000		-		0.000	0.000	0.134	-
Flight Subsystem	MIPR	Dynetics : Hunstville, AL	0.000	31.961	Jan 2022	126.807	Dec 2022	44.073	Dec 2023	-		44.073	0.000	202.841	-

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Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Flight Subsystem	MIPR	Southern Research : Birmingham, AL	0.000	6.067	Oct 2021	4.331	Oct 2022	2.095	Oct 2023	-		2.095	0.000	12.493	-
Platform Integration	SS/CPIF	Lockheed Martin Corporation : Denver, CO	155.058	261.465	Jan 2022	221.818	Jan 2023	98.758	Oct 2023	-		98.758	Continuing	Continuing	Continuing
Platform Integration	WR	NAVAIR (PMA 281) : Patuxent River, MD	12.309	20.186	Oct 2021	14.736	Nov 2022	21.427	Nov 2023	-		21.427	Continuing	Continuing	Continuing
Test and Evaluation	MIPR	Yuma Proving Ground (YPG) : Yuma, AZ	0.242	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Science & Technology / Advanced Capabilities	MIPR	Air Force Life Cycle Management Center : Wright-Patterson Air Force Base, OH	0.145	0.000		0.000		0.000		-		0.000	0.000	0.145	-
Science & Technology / Advanced Capabilities	SS/CPFF	US Army Combat Capabilities Aviation & Missile Cen : Huntsville, AL	0.000	0.000		5.730	Nov 2022	2.000	Nov 2023	-		2.000	Continuing	Continuing	Continuing
Science & Technology / Advanced Capabilities	C/CPFF	John Hopkins University/Applied Physics Laboratory : Laurel, MD	2.109	3.541	Oct 2021	7.558	Oct 2022	7.815	Oct 2023	-		7.815	Continuing	Continuing	Continuing
Science & Technology / Advanced Capabilities	C/CPFF	Lockheed Martin HEAT : Denver, CO	0.000	3.775	Oct 2021	0.000		0.000		-		0.000	0.000	3.775	-
Science & Technology / Advanced Capabilities	SS/CPFF	Draper : Boston, MA	8.436	12.935	Nov 2021	12.365	Nov 2022	10.631	Nov 2023	-		10.631	0.000	44.367	-
Science & Technology / Advanced Capabilities	MIPR	Lawrence Livermore National Laboratory : Livermore, CA	0.786	3.121	Oct 2021	6.857	Oct 2022	1.400	Oct 2023	-		1.400	0.000	12.164	-
Science & Technology / Advanced Capabilities	MIPR	Sandia National Laboratory : Albuquerque, NM	4.070	13.749	Dec 2021	34.280	Dec 2022	25.646	Dec 2023	-		25.646	0.000	77.745	-

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Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0605518N / CONVENTIONAL PROMPT STRIKE (CPS)				Project (Number/Name) 3334 / Conventional Prompt Strike (CPS)					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Science & Technology / Advanced Capabilities	C/BA	Southern Research : Birmingham, AL	0.000	0.000		4.398	Dec 2022	0.000		-		0.000	0.000	4.398	-
Subtotal			483.540	838.030		886.540		480.695		-		480.695	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Flight Subsystem	C/CPFF	John Hopkins University/Applied Physics Laboratory : Laurel, MD	0.826	1.590	Oct 2021	2.151	Oct 2022	2.095	Oct 2023	-		2.095	Continuing	Continuing	Continuing
Flight Subsystem	WR	NSWC, Crane Division : Crane, IN	2.866	2.563	Oct 2021	4.890	Oct 2022	4.369	Oct 2023	-		4.369	Continuing	Continuing	Continuing
Flight Subsystem	WR	NSWC, Dahlgren Division : Dahlgren, VA	0.737	2.178	Oct 2021	1.734	Oct 2022	2.191	Oct 2023	-		2.191	Continuing	Continuing	Continuing
Platform Integration	C/CPFF	John Hopkins University/Applied Physics Laboratory : Laurel, MD	1.967	4.003	Oct 2021	3.487	Oct 2022	3.455	Oct 2023	-		3.455	Continuing	Continuing	Continuing
Platform Integration	WR	NSWC, Crane Division : Crane, IN	11.054	11.092	Oct 2021	13.450	Oct 2022	15.732	Oct 2023	-		15.732	Continuing	Continuing	Continuing
Platform Integration	WR	NSWC, Dahlgren Division : Dahlgren, VA	1.426	1.877	Oct 2021	1.486	Oct 2022	1.774	Oct 2023	-		1.774	Continuing	Continuing	Continuing
Platform Integration	WR	NSWC, Indian Head Division : Indian Head, MD	0.540	0.540	Oct 2021	0.419	Oct 2022	0.435	Oct 2023	-		0.435	Continuing	Continuing	Continuing
Platform Integration	WR	NSWC, Carderock Division : Carderock, MD	0.000	0.000		0.124	Oct 2022	0.000		-		0.000	0.000	0.124	-

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Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0605518N / CONVENTIONAL PROMPT STRIKE (CPS)				Project (Number/Name) 3334 / Conventional Prompt Strike (CPS)					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Platform Integration	WR	NUWC, Newport Division : Newport, RI	9.837	0.000		16.152	Oct 2022	33.605	Oct 2023	-		33.605	Continuing	Continuing	Continuing
Platform Integration	Various	PMS 425 : Washington DC	5.188	0.000		3.371	Nov 2022	8.300	Nov 2023	-		8.300	Continuing	Continuing	Continuing
Platform Integration	Various	PMS 392 : Washington DC	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	-
Platform Integration	Various	PMS 450 : Washington DC	15.306	0.000		7.256	Oct 2022	67.733	Oct 2023	-		67.733	Continuing	Continuing	Continuing
Platform Integration	MIPR	Sandia National Laboratory : Albuquerque, NM	0.736	1.127	Dec 2021	0.104	Dec 2022	0.100	Dec 2023	-		0.100	Continuing	Continuing	Continuing
Platform Integration	C/CPFF	BAE : Washington DC	0.040	0.206	Oct 2021	0.000		0.000		-		0.000	0.000	0.246	-
Platform Integration	MIPR	Lawrence Livermore National Laboratory : Livermore, CA	0.000	0.000		0.689	Oct 2022	0.700	Oct 2023	-		0.700	0.000	1.389	-
Test and Evaluation	WR	NUWC, Newport Division : Newport, RI	0.271	0.000		0.533	Oct 2022	1.456	Oct 2023	-		1.456	Continuing	Continuing	Continuing
Test and Evaluation	MIPR	US Army Space and Missile Defense Command (SMDC) : Redstone Arsenal, AL	0.000	0.511	Oct 2021	0.000		0.210	Oct 2023	-		0.210	0.000	0.721	-
Test and Evaluation	MIPR	Vandenberg AFB, 30th SW : Vandenberg Air Force Base, CA	0.116	0.000		0.000		0.000		-		0.000	0.000	0.116	-
Weapon System Integration	C/CPFF	BAE SYSTEMS : Falls Church, VA	0.253	0.508	Oct 2021	0.740	Oct 2022	0.706	Oct 2023	-		0.706	Continuing	Continuing	Continuing
Weapon System Integration	C/CPFF	Emcube : Alexandria, VA	0.000	1.000	Oct 2021	0.995	Oct 2022	1.058	Oct 2023	-		1.058	0.000	3.053	-

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Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Weapon System Integration	C/CPFF	JHU/APL : Laurel, MD	5.883	6.616	Nov 2021	7.118	Nov 2022	7.152	Nov 2023	-		7.152	Continuing	Continuing	Continuing
Weapon System Integration	MIPR	Lawrence Livermore National Laboratory : Livermore, CA	1.755	2.455	Nov 2021	4.204	Jan 2023	4.586	Oct 2023	-		4.586	Continuing	Continuing	Continuing
Weapon System Integration	SS/CPIF	Lockheed Martin Corporation : Denver, CO	44.345	92.733	Jan 2022	26.913	Jan 2023	11.982	Nov 2023	-		11.982	Continuing	Continuing	Continuing
Weapon System Integration	MIPR	NIWCATL : Charleston, SC	0.056	0.000		0.000		0.000		-		0.000	0.000	0.056	-
Weapon System Integration	WR	NSWC, Crane Division : Crane, IN	13.889	16.973	Nov 2021	18.200	Nov 2022	22.115	Nov 2023	-		22.115	Continuing	Continuing	Continuing
Weapon System Integration	WR	NSWC, Dahlgren Division : Dahlgren, VA	0.053	0.241	Jan 2022	0.000		0.000		-		0.000	0.000	0.294	-
Weapon System Integration	WR	NSWC, Indian Head Division : Indian Head, MD	1.138	1.153	Nov 2021	0.573	Nov 2022	0.626	Nov 2023	-		0.626	Continuing	Continuing	Continuing
Weapon System Integration	WR	NUWC, Newport Division : Newport, RI	0.861	0.000		1.377	Nov 2022	1.368	Nov 2023	-		1.368	Continuing	Continuing	Continuing
Weapon System Integration	C/CPFF	Penn State University / Applied Research Laboratory : Penn State, PA	0.825	0.784	Oct 2021	2.154	Oct 2022	2.223	Oct 2023	-		2.223	Continuing	Continuing	Continuing
Weapon System Integration	Various	SPCIO : Washington DC	0.750	0.450	Mar 2022	1.596	Apr 2023	2.057	Apr 2024	-		2.057	Continuing	Continuing	Continuing
Weapon System Integration	C/CPFF	Techpride : Blacksburg, VA	0.058	0.058	Oct 2021	0.060	Oct 2022	0.058	Oct 2023	-		0.058	Continuing	Continuing	Continuing
Weapon System Integration	SS/CPFF	Draper : Boston, MA	0.000	0.000		0.380	Oct 2022	0.000		-		0.000	0.000	0.380	-

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Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0605518N / CONVENTIONAL PROMPT STRIKE (CPS)				Project (Number/Name) 3334 / Conventional Prompt Strike (CPS)					
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Weapon System Integration	C/BA	GSA : Arlington, VA	0.000	0.000		0.960	Nov 2022	0.982	Nov 2023	-		0.982	0.000	1.942	-
Weapon System Integration	WR	NSWC, Corona : Corona, CA	0.000	0.000		0.796	Oct 2022	0.798	Oct 2023	-		0.798	0.000	1.594	-
Weapon System Integration	C/CPFF	Peraton : Herndon, VA	0.000	0.000		0.054	Oct 2022	0.052	Oct 2023	-		0.052	0.000	0.106	-
Weapon System Integration	MIPR	Washington Headquarters Services (WHS) : Arlington, VA	0.000	0.000		0.942	Dec 2022	0.455	Dec 2023	-		0.455	0.000	1.397	-
Weapon System Integration	WR	NSWC, Port Hueneme : Port Hueneme, CA	0.000	0.000		0.259	Oct 2022	0.000		-		0.000	0.000	0.259	-
Science & Technology / Advanced Capabilities	MIPR	CECOM : Aberdeen Proving Ground, MD	0.401	3.558	Oct 2021	0.000		0.000		-		0.000	0.000	3.959	-
Science & Technology / Advanced Capabilities	WR	NSWC, Crane Division : Crane, IN	2.651	12.408	Oct 2021	24.817	Oct 2022	18.469	Oct 2023	-		18.469	0.000	58.345	-
Subtotal			123.928	164.624		147.984		216.842		-		216.842	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	C/CPFF	BAE : Falls Church, VA	0.449	0.465	Oct 2021	0.000		0.000		-		0.000	0.000	0.914	-
Developmental Test & Evaluation (DT&E)	SS/IDIQ	Jacobs : Dallas, TX	0.833	1.700	Nov 2021	2.917	Nov 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	Naval Air Warfare Center Weapons Division (China L : China Lake, CA	40.106	83.379	Oct 2021	60.982	Oct 2022	41.585	Oct 2023	-		41.585	Continuing	Continuing	Continuing

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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	WR	NAVFAC : Crane, IN	7.587	73.160	Oct 2021	18.751	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC, Crane Division : Crane, IN	0.273	0.000		0.000		0.000		-		0.000	0.000	0.273	-
Developmental Test & Evaluation (DT&E)	MIPR	45th Space Wing : Patrick Air Force Base, FL	0.000	4.398	Oct 2021	1.359	Oct 2022	0.126	Oct 2023	-		0.126	Continuing	Continuing	Continuing
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	MIPR	Arnold Engineering Development Complex (AEDC) : Arnold Air Force Base, TN	1.199	0.000		0.000		0.000		-		0.000	0.000	1.199	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	Naval Air Force, US Pacific (COMNAVAIRPAC) : San Diego, CA	0.164	0.000		0.000		0.000		-		0.000	0.000	0.164	-
Developmental Test & Evaluation (DT&E)	C/CPFF	Hana : Honolulu, HI	0.345	0.564	Feb 2022	0.465	Feb 2023	0.468	Feb 2024	-		0.468	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	C/CPFF	JHU/APL : Laurel, MD	1.698	3.703	Oct 2021	3.413	Oct 2022	3.736	Oct 2023	-		3.736	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	MIPR	Lawrence Livermore National Laboratory : Livermore, CA	2.997	7.017	Oct 2021	9.750	Oct 2022	6.250	Oct 2023	-		6.250	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	SS/CPIF	Lockheed Martin Corporation : Denver, CO	11.846	15.239	Oct 2021	8.661	Oct 2022	3.856	Oct 2023	-		3.856	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	MIPR	NASA Goddard Space Flight Center Wallops Flight Fa : Greenbelt, MD	1.369	1.684	Oct 2021	1.542	Oct 2022	1.264	Oct 2023	-		1.264	Continuing	Continuing	Continuing
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	Various	NAVAIR COMMAND : Patuxent River, MD	1.577	0.000		0.000		0.000		-		0.000	0.000	1.577	-

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Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	Sub Allot	NOTU : Cape Canaveral, FL	0.121	0.000		0.000		0.000		-		0.000	0.000	0.121	-
Developmental Test & Evaluation (DT&E)	WR	NSWC, Crane Division : Crane, IN	1.240	3.252	Oct 2021	2.575	Oct 2022	2.568	Oct 2023	-		2.568	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	WR	NSWC, Dahlgren Division : Dahlgren, VA	8.897	31.070	Dec 2021	19.093	Oct 2022	28.494	Oct 2023	-		28.494	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	MIPR	Pacific Missile Range Facility : Hawaii	4.977	0.000		11.127	Oct 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation (DT&E)	MIPR	Sandia National Laboratory : Albuquerque, NM	9.401	16.269	Oct 2021	3.932	Oct 2022	11.577	Oct 2023	-		11.577	Continuing	Continuing	Continuing
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	Surface Combat Systems Center Wallops (SCSC) : Wallops Island, VA	0.142	0.388	Oct 2021	0.000		0.000		-		0.000	0.000	0.530	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC, Indian Head Division : Indian Head, MD	0.000	0.000		0.000		0.052	Oct 2023	-		0.052	0.000	0.052	-
Developmental Test & Evaluation (DT&E)	Various	various : range : Not Specified	9.000	3.742	Oct 2021	0.000		80.000	Oct 2023	-		80.000	0.000	92.742	-
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	MIPR	Missile and Space Intelligence Center (MSIC) : Redstone Arsenal, AL	0.420	0.608	Oct 2021	0.418	Oct 2022	0.412	Oct 2023	-		0.412	Continuing	Continuing	Continuing
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	MIPR	National Air and Space Intelligence Center : Wright-Patterson Air Force Base, OH	0.000	0.404	Oct 2021	0.314	Oct 2022	0.303	Oct 2023	-		0.303	Continuing	Continuing	Continuing
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	MIPR	National Ground Intelligence	0.000	0.134	Oct 2021	0.000		0.000		-		0.000	0.000	0.134	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0605518N / CONVENTIONAL PROMPT STRIKE (CPS)						Project (Number/Name) 3334 / Conventional Prompt Strike (CPS)			
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		Center (NGIC) : Charlottesville, VA													
Prior Year Developmental Test & Evaluation Not Funded FYDP (PYDT&E)	WR	NSWC, Carderock Division : Carderock, MD	0.734	0.319	Oct 2021	0.000		0.000		-		0.000	0.000	1.053	-
Subtotal			105.375	247.495		145.299		180.691		-		180.691	Continuing	Continuing	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Flight Subsystem	C/CPFF	Peraton : Herndon, VA	0.052	0.100	Oct 2021	0.000		0.000		-		0.000	0.000	0.152	-
Weapon System Integration	C/CPFF	EMCUBE : Alexandria, VA	0.160	0.000		0.000		0.000		-		0.000	0.000	0.160	-
Weapon System Integration	C/CPFF	JHU/APL : Laurel, MD	2.009	1.225	Oct 2021	0.751	Oct 2022	0.939	Oct 2023	-		0.939	Continuing	Continuing	Continuing
Weapon System Integration	SS/CPIF	Lockheed Martin Corporation : Denver, CO	14.028	14.531	Feb 2022	11.742	Feb 2023	5.228	Feb 2024	-		5.228	Continuing	Continuing	Continuing
Weapon System Integration	WR	NSWC, Crane Division : Crane, IN	9.809	6.262	Oct 2021	6.778	Oct 2022	6.669	Oct 2023	-		6.669	Continuing	Continuing	Continuing
Weapon System Integration	C/CPFF	Delta Resources, INC (VTG) : Chantilly, VA	3.620	5.501	Mar 2022	5.947	Mar 2023	10.000	Mar 2024	-		10.000	Continuing	Continuing	Continuing
Subtotal			29.678	27.619		25.218		22.836		-		22.836	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			742.521	1,277.768		1,205.041		901.064		-		901.064	Continuing	Continuing	N/A
Remarks															

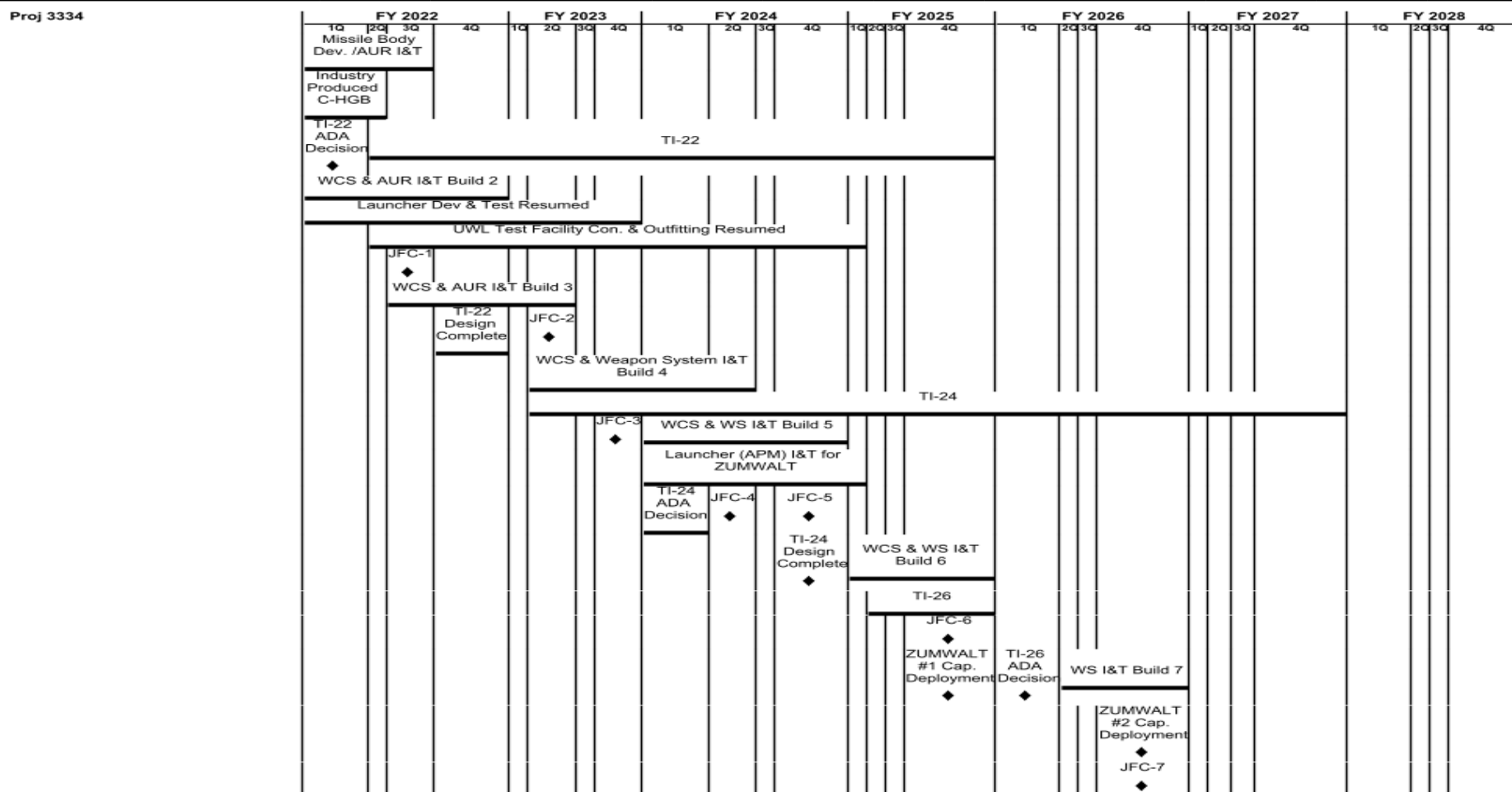
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PE 0605518N: *CONVENTIONAL PROMPT STRIKE (CPS)*
Navy

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R-1 Program Element (Number/Name) PE 0605518N / CONVENTIONAL PROMPT STRIKE (CPS)
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Project (Number/Name)	3334 / Conventional Prompt Strike (CPS)
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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

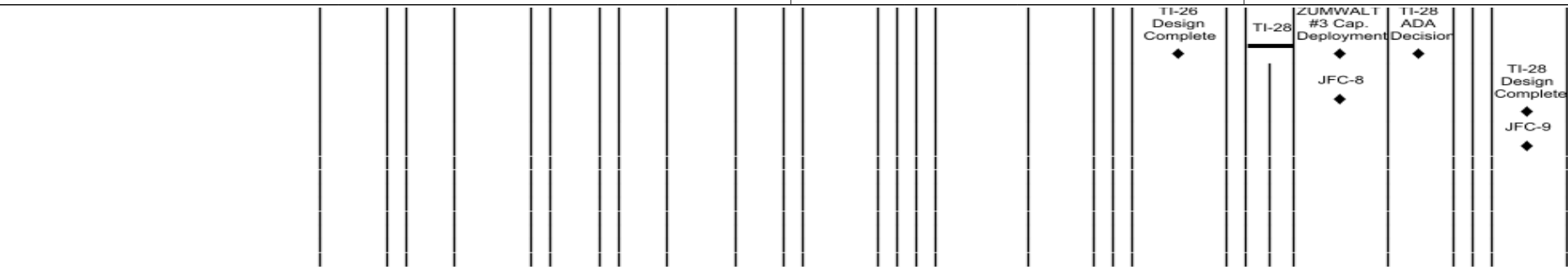
1319 / 4

R-1 Program Element (Number/Name)

PE 0605518N / CONVENTIONAL PROMPT STRIKE (CPS)

Project (Number/Name)	Start Date	End Date	Status	Manager	Budget (USD)	Actual Cost (USD)	Progress (%)	Risk Level	Notes
P001 / Project Alpha	2023-01-15	2023-06-30	Completed	J. Doe	120000	118000	100	Low	Exceeded expectations.
P002 / Project Beta	2023-02-01	2023-08-15	In Progress	A. Smith	85000	65000	75	Medium	Minor delays in procurement.
P003 / Project Gamma	2023-03-10	2023-09-30	On Hold	M. Chen	200000	0	0	High	Waiting for client approval.
P004 / Project Delta	2023-04-01	2023-10-31	Planned	S. Kim	95000	0	0	Medium	Initial planning phase.
P005 / Project Epsilon	2023-05-01	2023-11-30	Planned	L. Garcia	150000	0	0	Medium	Resource allocation in progress.

3334 / Conventional Prompt Strike (CPS)



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

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R-1 Program Element (Number/Name)

PE 0605518N / CONVENTIONAL PROMPT STRIKE (CPS)

Project (Number/Name)

3334 / Conventional Prompt Strike (CPS)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3334				
Missile Body Development/AUR I&T	1	2022	3	2022
Industry Produced Common Hypersonic Glide Body (C-HGB)	1	2022	2	2022
TI-22 ADA Decision	1	2022	1	2022
TI-22	2	2022	4	2025
WCS & AUR I&T Build 2	1	2022	4	2022
Launcher Development & Test Resumed	1	2022	4	2023
Underwater Launch (UWL) Test Facility Construction and Outfitting Resumed	2	2022	1	2025
JFC-1	3	2022	3	2022
WCS & AUR I&T Build 3	3	2022	2	2023
TI-22 Design Complete	4	2022	4	2022
JFC-2	2	2023	2	2023
WCS and Weapon System I&T Build 4	2	2023	2	2024
TI-24	2	2023	4	2027
JFC-3	4	2023	4	2023
WCS and WS I&T Build 5	1	2024	4	2024
Launcher (APM) I&T for ZUMWALT	1	2024	1	2025
TI-24 ADA Decision	1	2024	1	2024
JFC-4	2	2024	2	2024
JFC-5	4	2024	4	2024
TI-24 Design Complete	4	2024	4	2024
WCS and WS I&T Build 6	1	2025	4	2025

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023	
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0605518N / CONVENTIONAL PROMPT STRIKE (CPS)		Project (Number/Name) 3334 / Conventional Prompt Strike (CPS)
		Start		End
Events by Sub Project		Quarter	Year	Quarter Year
TI-26		2	2025	4 2025
JFC-6		4	2025	4 2025
ZUMWALT #1 Capability Deployment		4	2025	4 2025
TI-26 ADA Decision		1	2026	1 2026
WS I&T Build 7		2	2026	4 2026
ZUMWALT #2 Capability Deployment		4	2026	4 2026
JFC-7		4	2026	4 2026
TI-26 Design Complete		4	2026	4 2026
TI-28		2	2027	3 2027
ZUMWALT #3 Capability Deployment		4	2027	4 2027
TI-28 ADA Decision		1	2028	1 2028
JFC-8		4	2027	4 2027
TI-28 Design Complete		4	2028	4 2028
JFC-9		4	2028	4 2028

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0605518N / <i>CONVENTIONAL PROMPT STRIKE (CPS)</i>				Project (Number/Name) 9999 / <i>Congressional Adds</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: <i>Congressional Adds</i>	0.000	4.827	25.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	29.827
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification
 The Conventional Prompt Strike (CPS) program will accelerate development and demonstration flight testing by leveraging commercial and reusable launch services with a modular Multi-service Advanced Capability for Hypersonics Test Bed (MACH-TB) design.

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023
<i>Congressional Add:</i> Cross-service hypersonic testing capabilities through adv. concepts tech. eval.	4.827	0.000
<i>FY 2022 Accomplishments:</i> Awarded Phase 1 MACH-TB contract, developed a universal payload adapter for DoD systems to integrate with commercial launch service providers, and developed the test vehicle to demonstrate payload separation. Full-scale Test (FST) flight test planned for Q3 FY 2023.		
<i>FY 2023 Plans:</i> N/A		
<i>Congressional Add:</i> Flight tests	0.000	25.000
<i>FY 2022 Accomplishments:</i> N/A		
<i>FY 2023 Plans:</i> - Procure commercial launch services to test Experimental Glide Body (EGB) design and integrated payloads.		
- Procure Assembly Integration & Test Equipment for MACH-TB flight test capability and capacity.		
- Define, design, and prototype modular testbed design with modular, open interfaces for additional full scale flights in FY 2024 and FY 2025.		
Congressional Adds Subtotals	4.827	25.000

C. Other Program Funding Summary (\$ in Millions)
 N/A

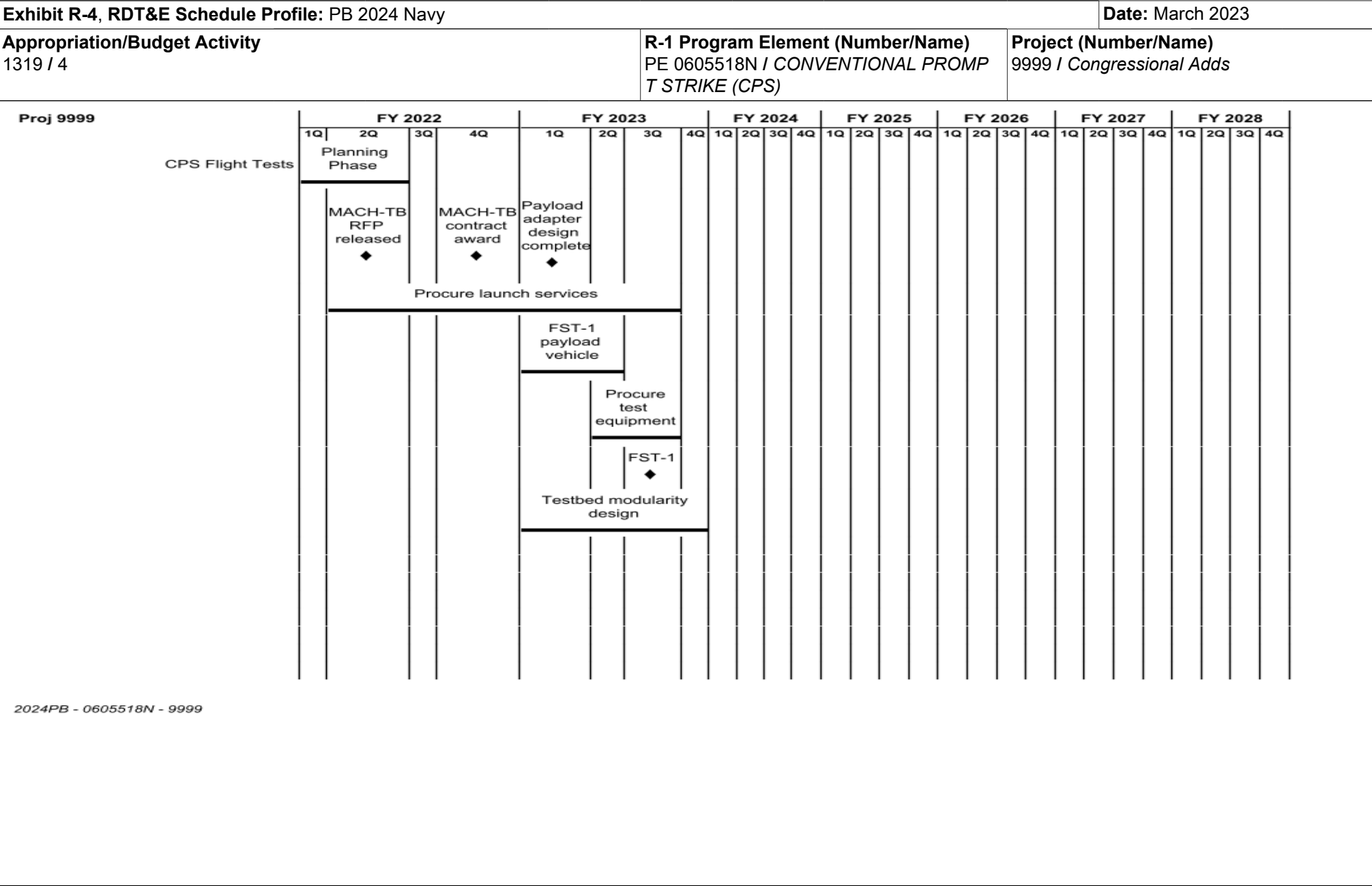
Remarks

D. Acquisition Strategy
 N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023					
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0605518N / CONVENTIONAL PROMPT STRIKE (CPS)						Project (Number/Name) 9999 / Congressional Adds					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total					
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract		
C763	WR	NWSC Crane Division : Crane, IN	0.000	1.931	May 2022	0.000		0.000		-		0.000	0.000	1.931	-		
C763	MIPR	Sandia National Laboratory : Albuquerque, NM	0.000	2.896	May 2022	0.000		0.000		-		0.000	0.000	2.896	-		
C881	MIPR	Dynetics : Huntsville, AL	0.000	0.000		19.000	Apr 2023	0.000		-		0.000	0.000	19.000	-		
C881	C/BA	Sandia National Laboratory : Albuquerque, NM	0.000	0.000		3.000	Mar 2023	0.000		-		0.000	0.000	3.000	-		
C881	C/BA	SAIC : Crane, IN	0.000	0.000		3.000	Apr 2023	0.000		-		0.000	0.000	3.000	-		
Subtotal			0.000	4.827		25.000		0.000		-		0.000	0.000	29.827	N/A		
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals			0.000	4.827		25.000		0.000		-		0.000	0.000	29.827	N/A		
Remarks																	

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0605518N / CONVENTIONAL PROMPT STRIKE (CPS)	Project (Number/Name) 9999 / Congressional Adds	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
CPS Flight Tests: Planning Phase	1	2022	2	2022
CPS Flight Tests: MACH-TB RFP released	2	2022	2	2022
CPS Flight Tests: MACH-TB contract awarded	4	2022	4	2022
CPS Flight Tests: Payload adapter design complete	1	2023	1	2023
CPS Flight Tests: Procure launch services	2	2022	3	2023
CPS Flight Tests: FST-1 payload vehicle produced	1	2023	2	2023
CPS Flight Tests: Procure test equipment	2	2023	3	2023
CPS Flight Tests: FST-1	3	2023	3	2023
CPS Flight Tests: Testbed modularity design	1	2023	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity	R-1 Program Element (Number/Name)											
1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	PE 0303354N / ASW Systems Development - MIP											
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	81.962	8.536	9.769	10.167	-	10.167	10.134	10.276	10.391	10.598	Continuing	Continuing
0490: <i>Airborne Acoustic Intelligence (AAI)</i>	81.962	8.536	9.769	10.167	-	10.167	10.134	10.276	10.391	10.598	Continuing	Continuing

A. Mission Description and Budget Item Justification

The mission of Airborne ASW Intelligence (AAI) (CNO Project K-0416) is to provide advanced Anti-Submarine Warfare (ASW) capabilities through development of new technology and prototype mechanisms for the collection and analysis of ASW related intelligence. This includes full spectrum intelligence collections, analysis, and cataloging of current peer and near peer adversaries. The program develops and deploys disruptive technologies to counter emerging threats in order to maintain the United States' current undersea warfare superiority. AAI employs systems such as the Mighty Orion and Anti-Submarine Warfare Mission Planning and Reconstruction Systems (AMPRS) to support the Tasking, Collection, Processing, Exploitation, and Dissemination (TC/PED) of passive and active intelligence measurements of current and next generation submarine vulnerabilities. The AAI data collection program provides full spectrum, measured intelligence data essential for the design and development of advanced sensors, weapon systems, environmental models, and tactical decision aids by using currently fielded sonobuoy systems; developing the Passive Extended Range Sonobuoy System; and providing prototype AN/SSQ-113 Naval Underwater Active Multi-ping family of sensors to collect active target strength measurement data for the Intelligence Community. AAI collection systems are installed and employed on uniquely configured platforms, specially configured ground support facilities, ships, and other assets as required for the collection, processing, exfiltration, and dissemination of undersea intelligence. AAI develops advanced components and system prototype for advanced detection and tracking systems, specially designed sensors, advanced processing systems and techniques, and specially derived tactics.

This is a Military Intelligence Program (MIP).

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy				Date: March 2023	
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0303354N / ASW Systems Development - MIP			
B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	8.536	9.856	10.149	-	10.149
Current President's Budget	8.536	9.769	10.167	-	10.167
Total Adjustments	0.000	-0.087	0.018	-	0.018
• Congressional General Reductions	-	-0.087			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	0.018	-	0.018
Change Summary Explanation					
FY 2024 increased since the previous President's Budget submission by \$0.018M to account for inflationary and working capital fund rate adjustments.					
PB24 schedule reflects completion of the Furious Krypton effort in FY23. The PERSS line has been broken out into Design Development phase that ends in FY26 and Prototype Procurement beginning FY27. Fielding/Capability milestone has been added to 1Q FY28 due to transition of the Office of Naval Research Future Naval Capabilities Extended Range - Directional Finding and Recording (ER-DIFAR) to a lower technology readiness level that necessitate addition of significant development activities. Active NUAMP line reflects prototype procurement throughout FYDP; Active NUAMP Design Development has been broken out to show effort completes FY24. Test and Evaluation line has been broken out into Integrated Testing ending in FY24 and ER-DIFAR Qualification Testing beginning in FY25. ER-DIFAR Integration Testing beginning in FY26 and ending in FY27. Supply chain issues and material shortages have delayed FY22 NUAMP prototype delivery. Quantity of 72 (FY22 qty 36 and FY23 qty 36) will deliver 4Q FY23.					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0303354N / ASW Systems Developmen t - MIP				Project (Number/Name) 0490 / Airborne Acoustic Intelligence (AAI)			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
0490: Airborne Acoustic Intelligence (AAI)	81.962	8.536	9.769	10.167	-	10.167	10.134	10.276	10.391	10.598	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The mission of Airborne ASW Intelligence (AAI) (CNO Project K-0416) is to provide advanced Anti-Submarine Warfare (ASW) capabilities through development of new technology and prototype mechanisms for the collection and analysis of ASW related intelligence. This includes full spectrum intelligence collections, analysis, and cataloging of current peer and near peer adversaries. The program develops and deploys disruptive technologies to counter emerging threats in order to maintain the United States' current undersea warfare superiority. AAI employs systems such as the Mighty Orion and Anti-Submarine Warfare Mission Planning and Reconstruction Systems (AMPRS) to support the Tasking, Collection, Processing, Exploitation, and Dissemination (TC/PED) of passive and active intelligence measurements of current and next generation submarine vulnerabilities. The AAI data collection program provides full spectrum, measured intelligence data essential for the design and development of advanced sensors, weapon systems, environmental models, and tactical decision aids by using currently fielded sonobuoy systems; developing the Passive Extended Range Sonobuoy System; and providing prototype AN/SSQ-113 Naval Underwater Active Multi-ping family of sensors to collect active target strength measurement data for the Intelligence Community. AAI collection systems are installed and employed on uniquely configured platforms, specially configured ground support facilities, ships, and other assets as required for the collection, processing, exfiltration, and dissemination of undersea intelligence. AAI develops advanced components and system prototype for advanced detection and tracking systems, specially designed sensors, advanced processing systems and techniques, and specially derived tactics.

This is a Military Intelligence Program (MIP).

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Systems Engineering	1.445	1.559	1.444	0.000	1.444
Articles:	-	-	-	-	-
FY 2023 Plans: Engineering support of Acoustic Intelligence (ACINT) as well as Anti-Submarine Warfare Mission Planning and Reconstruction System (AMPRS) for certified P-8 and H-60 AAI collection platforms and management of full spectrum database. Engineering support for design upgrades to ACINT Collection Suites for certified AAI collection platforms. Enhance P-8 aircraft adjunct sensor station, Mighty Orion (MO), for prototyping of in-flight analysis and dissemination of ACINT. Continue evaluation of Fleet software releases for Office of Naval Intelligence (ONI) certification aboard ASW collection platforms. Continue upgrades and development of					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0303354N / ASW Systems Development - MIP		Project (Number/Name) 0490 / Airborne Acoustic Intelligence (AAI)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
hardware and software for unique airborne avionics and sensors and fielding MO mission kits in support of P-8A deployments. FY 2024 Base Plans: Engineering support of ACINT as well as AMPRS for certified P-8 and H-60 AAI collection platforms and management of full spectrum database. Enhance P-8 aircraft adjunct sensor station, MO, for prototyping of in-flight analysis and dissemination of ACINT. Evaluation of Fleet software releases for ONI certification aboard ASW collection platforms. Evaluate and development of hardware and software upgrades for unique airborne avionics and sensors and fielding MO mission kits in support of P-8A deployments. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: The Systems Engineering Cost has been decreased due to realized manpower reductions, as well as increased efficiency and cost savings to provide hardware and software solutions in support the ACINT data package delivery.						
Title: Data Collection and Analysis <div>Articles:</div>		1.143 -	1.248 -	1.750 -	0.000 -	1.750 -
FY 2023 Plans: Data collection support at Operational Wings and Tactical ASW commands. Ongoing collection of high interest current and future generation target acoustic data in support of Measurement and Signatures Intelligence (MASINT)/ONI threat assessment and trend analysis requirements for further development of future USN USW capabilities. Characterization, analysis and certification of the upgraded Fleet MASINT collection assets. Data reduction, Analysis and Fleet Rapid Feedback. Conduct special operations support. Provide essential performance modeling and evaluation for advanced technology sensor systems design and Fleet tactics development. Develop in mission and post mission analysis hardware, software, and processes in response to evolving enemy capabilities. FY 2024 Base Plans: Data collection support at Operational Wings and Tactical ASW commands. Ongoing collection of high interest current and future generation target acoustic data in support of MASINT/ONI threat assessment and trend analysis requirements for further development of future USN Undersea Warfare (USW) capabilities. Characterization, analysis and certification of the upgraded Fleet MASINT collection assets. Data reduction,						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0303354N / ASW Systems Development - MIP		Project (Number/Name) 0490 / Airborne Acoustic Intelligence (AAI)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Analysis and Fleet Rapid Feedback. Conduct special operations support. Provide essential performance modeling and evaluation for advanced technology sensor systems design and Fleet tactics development. Develop in mission and post mission analysis hardware, software, and processes in response to evolving enemy capabilities. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: The Ancillary Hardware Development cost increased in FY24 to allow for the development of additional ACINT data packages.						
Title: Navy Underwater Active Multiple Ping (NUAMP) Product Development Articles:		3.757 -	2.719 -	0.627 -	0.000 -	0.627 -
FY 2023 Plans: Conduct failure analysis and correction of previously discovered deficiencies for specific NUAMP frequencies. Transition in progress from design and development efforts for NUAMP sonic frequencies to procurement of prototype sonobuoys to enable fleet collection of active target strength measurements. FY 2024 Base Plans: The NUAMP prototype effort has fully transitioned from design and development efforts into procuring AN/SSQ-113 NUAMP prototype buoys across full range of frequencies to support fleet collection of active target strength measurements. Any future design and development efforts will take the form of engineering change proposals due to Diminishing Manufacturing Sources and Material Shortages. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Decrease in funding levels for the NUAMP effort is due to completion of design and development effort to support fleet collection of active target strength measurements.						
Title: Passive Extended Range Sonobuoy System (PERSS) Product Development Articles:		2.191 -	3.243 -	6.346 -	0.000 -	6.346 -
FY 2023 Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0303354N / ASW Systems Development - MIP		Project (Number/Name) 0490 / Airborne Acoustic Intelligence (AAI)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Development of disruptive innovative sensors required for the PERSS System-of-Systems (SoS) by experimenting and prototyping in a high fidelity and realistic operating environment. Transition various laboratory sonobuoy subsystems by proving the subsystems maturity in real world environments. Perform risk reduction technology demonstration efforts using high gain beamforming sonobuoy transducer assemblies. The transition of the Office of Naval Research Future Naval Capabilities Extended Range - Directional Finding and Recording (ER-DIFAR) to the AAI program. In this phase of the program the items requiring development are the aircraft qualification testing of the ER-DIFAR sensors and the integration efforts into the AAI Mighty Orion adjunct processing suite. FY 2024 Base Plans: Development of disruptive innovative sensors required for the PERSS System-of-Systems (SoS) by experimenting and prototyping in a high fidelity and realistic operating environment. Transition various laboratory sonobuoy subsystems by proving the subsystems maturity in real world environments. In this phase of the program the items requiring development are the tactics techniques and procedures as well as on aircraft integration and testing efforts. Increased cost and delayed schedule in the design development phase has impacted the operational capability delivery date of the ER-DIFAR. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: Increase is due to ramp-up of development and integration efforts and start of contractor testing. This effort is comprised of increased building of prototype assets and performing contractor design development testing in conjunction with utilization of open sea range test events.						
Title: Furious Krypton <div>Articles:</div>		0.000 -	1.000 -	0.000 -	0.000 -	0.000 -
FY 2023 Plans: Furious Krypton: Demonstration of disruptive innovative method to provide Tactical ASW data to multiple users both Beyond Line of Sight (BLOS) and via Satellite Communications (SATCOM). This effort completes in FY23. FY 2024 Base Plans: N/A FY 2024 OCO Plans:						

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0303354N / ASW Systems Development - MIP		Project (Number/Name) 0490 / Airborne Acoustic Intelligence (AAI)		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: Effort is completed.						
Accomplishments/Planned Programs Subtotals		8.536	9.769	10.167	0.000	10.167
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
Airborne ASW Intelligence (AAI) is a CNO Special Project. The included technology developments are primarily government led with contractor participation through existing vehicles.						

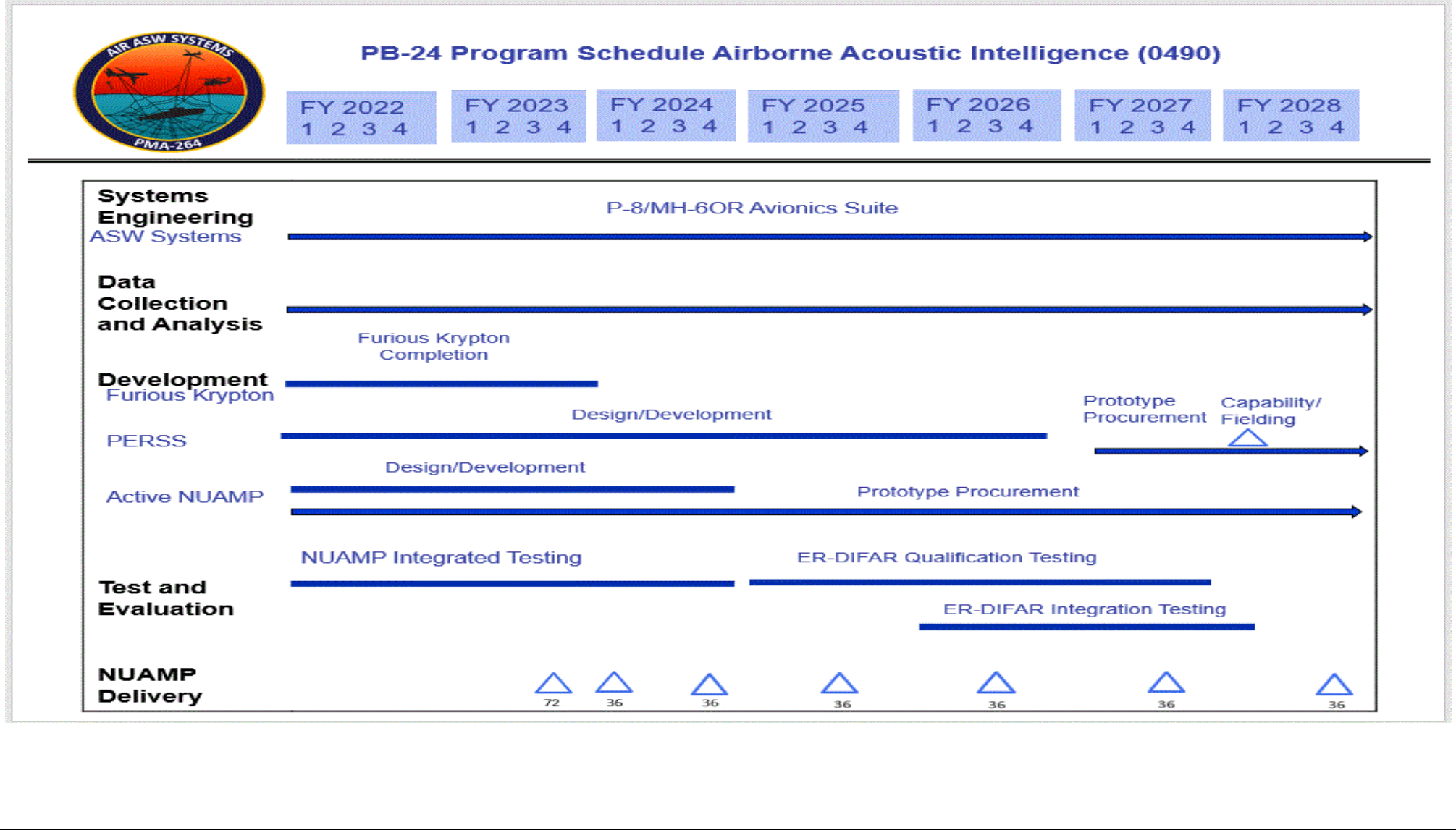
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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0303354N / ASW Systems Development - MIP					Project (Number/Name) 0490 / Airborne Acoustic Intelligence (AAI)				
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Active Measurement Validation	WR	NAWCAD : PATUXENT RIVER, MD	2.468	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Ancillary Hdw Development	WR	NAWCAD : PATUXENT RIVER, MD	8.054	0.325	Dec 2021	0.429	Dec 2022	0.456	Dec 2023	-		0.456	Continuing	Continuing	Continuing
Ancillary Hdw Development Cont	Various	VARIOUS : VARIOUS	3.936	1.280	Dec 2021	1.798	Dec 2022	1.955	Dec 2023	-		1.955	Continuing	Continuing	Continuing
Systems Eng	WR	NAWCAD : PATUXENT RIVER, MD	8.548	0.703	Dec 2021	0.741	Dec 2022	0.655	Dec 2023	-		0.655	Continuing	Continuing	Continuing
Systems Eng Cost	Various	VARIOUS : VARIOUS	5.225	1.169	Dec 2021	1.277	Dec 2022	0.789	Dec 2023	-		0.789	0.000	8.460	-
Primary Hdw Development	SS/CPIF	ERAPSCO : COLUMBIA CITY, IN	48.395	4.801	Dec 2021	5.257	Dec 2022	0.000		-		0.000	Continuing	Continuing	Continuing
Primary Hdw Development	C/IDIQ	VARIOUS : VARIOUS	0.000	0.000		0.000		6.042	Dec 2023	-		6.042	0.000	6.042	-
Subtotal			76.626	8.278		9.502		9.897		-		9.897	Continuing	Continuing	N/A
Remarks															
The Ancillary/Primary Hardware Development Continued increase in FY 2024 in accordance with the increase in PERSS efforts. Increase is due to the program ramp of ER-DIFAR for integration effort and will be performing additional qualification tests on ER-DIFAR sonobuoys. This effort is comprised of increased building of prototype assets and performing contractor design development testing in conjunction with utilization of open sea range test events. The Ancillary Hardware Development cost has been increased to allow for the development of additional ACINT data packages. The Systems Engineering cost has been decreased due to realized manpower reduction, cost savings and increased efficiency to provide hardware and software solutions in support the ACINT data package delivery. As of FY24, program transitions from sole source Joint Venture contract with ERAPSCO to a competitive multiple award contract which will result in the establishment of a new vendor base.															
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Mgt & Prof Spt Svcs (Non-FFRDC)	Various	VARIOUS : VARIOUS	4.302	0.213	Dec 2021	0.217	Dec 2022	0.220	Dec 2023	-		0.220	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023					
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0303354N / ASW Systems Development - MIP						Project (Number/Name) 0490 / Airborne Acoustic Intelligence (AAI)					
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total					
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract		
Travel	Various	VARIOUS : VARIOUS	0.415	0.045	Dec 2021	0.050	Dec 2022	0.050	Dec 2023	-		0.050	Continuing	Continuing	Continuing		
Prior year Mgmt Svcs no longer funded in the FYDP	Various	VARIOUS : VARIOUS	0.619	0.000		0.000		0.000		-		0.000	0.000	0.619	-		
Subtotal			5.336	0.258		0.267		0.270		-		0.270	Continuing	Continuing	N/A		
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals			81.962	8.536		9.769		10.167		-		10.167	Continuing	Continuing	N/A		
Remarks																	

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0303354N / ASW Systems Development - MIP		Project (Number/Name) 0490 / Airborne Acoustic Intelligence (AAI)	



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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0303354N / ASW Systems Development - MIP

Project (Number/Name)

0490 / Airborne Acoustic Intelligence (AAI)

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj: 0490 Airborne Acoustic Intelligence (AAI)				
Systems Engineering: ASW Systems: P-8/MH-60R Avionics Suite/ASW Systems	1	2022	4	2028
Data Collection and Analysis:	1	2022	4	2028
Product Development: Furious Krypton	1	2022	4	2023
Product Development: PERSS Design/Development	1	2022	4	2026
Product Development: Prototype Procurement	1	2027	4	2028
Product Development: PERSS Capability/Fielding	1	2028	1	2028
Product Development: NUAMP Design Development	1	2022	4	2024
Product Development: NUAMP Prototype Procurement	1	2022	4	2028
Product Development: Test & Evaluation: NUAMP Integrated Testing	1	2022	4	2024
Product Development: Test & Evaluation: ER-DIFAR Qualification Testing	1	2025	4	2027
Product Development: Test & Evaluation: ER-DIFAR Integration Testing	1	2026	4	2027
NUAMP Deliveries: DELIVERY1	4	2023	4	2023
NUAMP Deliveries: DELIVERY2	1	2024	1	2024
NUAMP Deliveries: DELIVERY3	4	2024	4	2024
NUAMP Deliveries: DELIVERY4	4	2025	4	2025
NUAMP Deliveries: DELIVERY5	4	2026	4	2026
NUAMP Deliveries: DELIVERY6	4	2027	4	2027
NUAMP Deliveries: DELIVERY7	4	2028	4	2028

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>					PE 0304240M / <i>Advanced Tactical Unmanned Aircraft System</i>							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	91.218	31.204	11.735	0.539	-	0.539	3.491	2.873	2.104	2.146	Continuing	Continuing
3135: <i>USMC MUX</i>	42.218	14.204	1.735	0.539	-	0.539	3.491	2.873	2.104	2.146	Continuing	Continuing
9999: <i>Congressional Adds</i>	49.000	17.000	10.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	76.000

A. Mission Description and Budget Item Justification

Project 3135 - The Marine Air Ground Task Force (MAGTF) Unmanned Aircraft System (UAS) Expeditionary (MUX) Family of Systems (FoS) project provides funding to address Tier 1 capability gaps identified in the October 2016 MUX Initial Capabilities Document (ICD) and April 2020 MUX Requirements Clarification document. This PE supports experimentation and prototyping of advanced payloads, system architectures, mission control capabilities, ground control stations, networking and communications infrastructure, and new air vehicles. In addition, MUX FoS will also develop CONOPS to integrate the MUX FoS into joint programs and operating concepts to mitigate technical risk through model-based systems engineering, analysis, simulation, test and evaluation, and partnership with industry.

The MUX FoS provides Advanced Tactical UAS in support of Expeditionary Advanced Base Operations (EABO), Littoral Operations in Contested Environments (LOCE), and Distributed Maritime Operations (DMO) to provide advanced, unmanned, multi-mission capability for the MAGTF and Marine Littoral Regiment (MLR). The first MUX FoS element is MUX Medium-Altitude, Long-Endurance (MUX MALE), a land-based Group 5 UAS scheduled to begin operating in INDOPACOM in FY23. RDT&E efforts for MUX-MALE are funded in PE 0603128N.

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	31.204	1.735	2.534	-	2.534
Current President's Budget	31.204	11.735	0.539	-	0.539
Total Adjustments	0.000	10.000	-1.995	-	-1.995
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	10.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	-2.000	-	-2.000
• Rate/Misc Adjustments	0.000	0.000	0.005	-	0.005

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 9999: *Congressional Adds*

FY 2022	FY 2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023	
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0304240M I Advanced Tactical Unmanned Aircraft System	
Congressional Add Details (\$ in Millions, and Includes General Reductions)		FY 2022	FY 2023
Congressional Add: Mobile Unmanned/Manned Distributed Lethality Airborne Network Joint Tech Demo		5.000	0.000
Congressional Add: K-max unmanned logistics system		7.000	0.000
Congressional Add: MQ-9 multi-mode radar pod		5.000	0.000
Congressional Add: Mobile unmanned/manned distributed lethality airborne network joint capability		0.000	10.000
Congressional Add Subtotals for Project: 9999		17.000	10.000
Congressional Add Totals for all Projects		17.000	10.000
Change Summary Explanation FY 2024 funding request was reduced by \$1.995M for higher department priorities and increased by \$0.005M for rate adjustments.			

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0304240M / <i>Advanced Tactical Unmann ed Aircraft System</i>				Project (Number/Name) 3135 / <i>USMC MUX</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
3135: <i>USMC MUX</i>	42.218	14.204	1.735	0.539	-	0.539	3.491	2.873	2.104	2.146	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 3135 - The Marine Air Ground Task Force (MAGTF) Unmanned Aircraft System (UAS) Expeditionary (MUX) Family of Systems (FoS) project provides funding to address capability gaps identified in the October 2016 MUX Initial Capabilities Document (ICD) and associated Requirements Clarification document. This PE supports experimentation and prototyping of advanced payloads, system architectures, mission control capabilities, ground control stations, and networking and communications infrastructure. In addition MUX FoS will also develop CONOPS to integrate the MUX FoS into joint programs and operating concepts to mitigate technical risk through model-based systems engineering, analysis, simulation, test and evaluation, and partnership with industry.

The MUX FoS provides Advanced Tactical UAS in support of Expeditionary Advanced Base Operations (EABO), Littoral Operations in Contested Environments (LOCE), and Distributed Maritime Operations (DMO) to provide advanced, unmanned, multi-mission capability for the MAGTF and Marine Littoral Regiment (MLR). The first MUX FoS element is Medium-Altitude, Long-Endurance (MALE), a land-based Group 5 UAS scheduled to begin operating in INDOPACOM in FY23. RDT&E efforts for MALE are funded in PE 0603128N.

MUX FoS within this Program Element will continue Mission System Payload development and assessment efforts for future system within and external to MALE program. Future Mission System Payloads will support Mission Sensors and other critical technologies that support future planned FoS capability.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: MUX Studies, Analysis, and Concept Refinement	10.680	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2023 Plans: N/A					
FY 2024 Base Plans: N/A					
FY 2024 OCO Plans: N/A					
Title: Test, Technical, Engineering and Management Services	3.524	1.735	0.539	0.000	0.539
Articles:	-	-	-	-	-
FY 2023 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy				Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0304240M / <i>Advanced Tactical Unmann ed Aircraft System</i>		Project (Number/Name) 3135 / <i>USMC MUX</i>		
<u>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</u>						
		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Continue to provide Government Systems Engineering and Program Management, Contractor RDT&E support, and travel. Tasking includes conducting Model Based Systems Engineering simulation using industry and threat data, and developing system and payload architecture studies to inform future integration approaches.						
<i>FY 2024 Base Plans:</i> Continue to provide Government Systems Engineering and Program Management, Contractor RDT&E support, and travel. Tasking includes conducting Model Based Systems Engineering simulation using industry and threat data and developing system and payload architecture studies to inform future integration approaches.						
<i>FY 2024 OCO Plans:</i> N/A						
<i>FY 2023 to FY 2024 Increase/Decrease Statement:</i> FY24 funding decrease \$1.196 due to transition of ILS and management services for the procurement Maritime Domain Awareness (MDA), and Electronic Warfare (EW) sensors.						
Accomplishments/Planned Programs Subtotals		14.204	1.735	0.539	0.000	0.539
<u>C. Other Program Funding Summary (\$ in Millions)</u> N/A						
<u>Remarks</u>						
<u>D. Acquisition Strategy</u> The MUX acquisition strategy leverages organic government resources, competitive and sole-source contract awards, and assisted acquisition approaches to conduct experimentation and prototyping of advanced payloads, system architectures, mission control capabilities, ground control stations, networking and communications infrastructure, and new air vehicles. Additionally, future MUX Mission System Payloads will leverage other services and government agencies with current technologies in development and will be available at a relatively mature technology.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0304240M / Advanced Tactical Unmanned Aircraft System					Project (Number/Name) 3135 / USMC MUX				
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MUX Studies and Experimentation	Various	USAF : Various	11.729	0.000		0.000		0.000		-		0.000	0.000	11.729	-
Requirements Analysis and Engineering Assessments	WR	Various : Various	5.977	0.945	Nov 2021	0.000		0.000		-		0.000	0.000	6.922	-
Mission System Development	Various	Various : Various	3.628	8.135	Jun 2022	0.000		0.000		-		0.000	0.000	11.763	-
Prize Challenge Award	Various	Various : Various	4.000	0.000		0.000		0.000		-		0.000	0.000	4.000	-
Modeling and Simulation	Various	NAWC AD : Patuxent River, MD	1.571	1.600	Nov 2021	0.000		0.000		-		0.000	0.000	3.171	-
Subtotal			26.905	10.680		0.000		0.000		-		0.000	0.000	37.585	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ILS	Various	Various : Various	0.000	0.000		0.000		0.100	Nov 2023	-		0.100	0.000	0.100	-
Subtotal			0.000	0.000		0.000		0.100		-		0.100	0.000	0.100	N/A
Remarks															
FY24 increase of \$.100 supports ILS for the transition of the procurement of the developed Airborne Network Extension (ANE)/SkyTower II, Maritime Domain Awareness (MDA), and Electronic Warfare (EW) sensors.															
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	Various	NAWCAD : Patuxent River, MD	0.220	0.000		0.000		0.000		-		0.000	0.000	0.220	-
Subtotal			0.220	0.000		0.000		0.000		-		0.000	0.000	0.220	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0304240M / Advanced Tactical Unmanned Aircraft System						Project (Number/Name) 3135 / USMC MUX			
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NAWCAD : Patuxent River, MD	7.254	0.905	Nov 2021	0.849	Nov 2022	0.300	Nov 2023	-		0.300	0.000	9.308	-
Program Management Support	Various	Various : Various	7.506	2.569	Nov 2021	0.842	Nov 2022	0.124	Nov 2023	-		0.124	Continuing	Continuing	Continuing
Travel	WR	NAWCAD : Patuxent River, MD	0.333	0.050	Nov 2021	0.044	Nov 2022	0.015	Nov 2023	-		0.015	0.000	0.442	-
Subtotal			15.093	3.524		1.735		0.439		-		0.439	Continuing	Continuing	N/A
Remarks FY24 decrease of \$1.296 transitions management services for the procurement of the developed Airborne Network Extension (ANE)/SkyTower II, Maritime Domain Awareness (MDA), and Electronic Warfare (EW) sensors.															
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			42.218	14.204		1.735		0.539		-		0.539	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy										Date: March 2023																			
Appropriation/Budget Activity 1319 / 4										R-1 Program Element (Number/Name) PE 0304240M / Advanced Tactical Unmanned Aircraft System										Project (Number/Name) 3135 / USMC MUX									

	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 3135																												
System Development: Mission System Payload Development																												
System Development: Technical Review and Analysis: Model Based Systems Engineering (MBSE)																												
System Development: Technical Review and Analysis: CONOPS Refinement																												
System Development: Technical Review and Analysis: Modeling and Simulation																												
Test & Evaluation: Technical Evaluation: Technical Evaluation (TE)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0304240M / Advanced Tactical Unmanned Aircraft System	Project (Number/Name) 3135 / USMC MUX	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3135				
System Development: Mission System Payload Development	1	2022	4	2028
System Development: Technical Review and Analysis: Model Based Systems Engineering (MBSE)	1	2022	4	2022
System Development: Technical Review and Analysis: CONOPS Refinement	1	2022	4	2022
System Development: Technical Review and Analysis: Modeling and Simulation	1	2022	4	2022
Test & Evaluation: Technical Evaluation: Technical Evaluation (TE)	1	2022	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0304240M / Advanced Tactical Unmann ed Aircraft System				Project (Number/Name) 9999 / Congressional Adds			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
9999: Congressional Adds	49.000	17.000	10.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	76.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project C629 - The Mobile Unmanned/Manned Distributed Lethality Airborne Network (MUDLAN) project provides development of high speed, high throughput, interoperable data link supporting Command and Control (C2), Intelligence, Surveillance, Reconnaissance (ISR) and Tactical Data in a SATCOM denied or restricted environment.

MUDLAN provides prototype development, testing, fleet experimentation, and concept refinement for next generation high speed, high throughput data link supporting C2, ISR and Tactical Data to connect and distribute multi-users across multiple domains in a common network architecture which enhances tactical edge situational awareness with a single user interface.

The modern protected communications capabilities allow manned and unmanned aircraft to share and disseminate large amounts of data using improved emergent communications technologies for multi-platform/ multi-service interoperability through Line-of-Sight (LOS) tactical data networks. These high-speed tactical data links are required at the forward edge where satellite services are not optimal and where existing airborne tactical data links do not support required speeds.

MUDLAN built a prototype joint tactical grid connecting over the horizon across 5 IP based links, including a high-capacity transport of 45 MBPS at 130 nautical miles in a single hop, total end to end connection of 220 nautical miles demonstrated at Pax River in March 2021. MUDLAN Joint Capability Technology Demonstration concludes this summer with two defined transitions of components into programs of record. The services are continuing to invest in specific upgrades to other components to meet evolving requirements.

Project C764 - Unmanned Logistics Support - Air (ULS-A)/KMAX provides for experimentation for unmanned cargo operations and includes complementary ISR, payloads, advanced sensors, autonomy; efforts refined requirements and Concept of Operations (CONOPS). This includes continued development of autonomous obstacle avoidance and landing system, and the continued development and integration of unique satellite communication systems designed for over-the-horizon use and operation in line-of-sight constrained environments.

Project C766 - MQ-9 Multi-Mode Radar Pod is a high-performance system that provides high-resolution, photographic-quality imagery that can be captured through clouds, rain, dust, smoke and fog. Designed to meet the onboard challenges of the Remotely Piloted Aircraft (RPA) systems environment, the radar consumes minimal Size, Weight and Power (SWAP) while delivering precision air to surface targeting accuracy and superb wide area search capabilities for both ground and maritime missions.

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0304240M / <i>Advanced Tactical Unmanned Aircraft System</i>	Project (Number/Name) 9999 / <i>Congressional Adds</i>
Project C882 - The Mobile Unmanned/Manned Distributed Lethality Airborne Network (MUDLAN) project provides development of high speed, high throughput, interoperable data link supporting Command and Control (C2), Intelligence, Surveillance, Reconnaissance (ISR) and Tactical Data in a SATCOM denied or restricted environment.		
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2022	FY 2023
Congressional Add: Mobile Unmanned/Manned Distributed Lethality Airborne Network Joint Tech Demo FY 2022 Accomplishments: FY22 MUDLAN CONAD funded completion of Phase 0 and Phase 1 of the MANGL Advanced Technology Insertion (MATI) program. Phase 0 focused on procurement of long lead-time hardware as well as initial design work with subcontractors. Phase 1 includes ground testing and surrogate airborne testing of the MATI system to integrate digital beam-forming and waveform network management as an advanced solution to the Airborne Network Extension (ANE) mission. FY 2023 Plans: N/A	5.000	0.000
Congressional Add: K-max unmanned logistics system FY 2022 Accomplishments: N/A FY 2023 Plans: N/A	7.000	0.000
Congressional Add: MQ-9 multi-mode radar pod FY 2022 Accomplishments: N/A FY 2023 Plans: N/A	5.000	0.000
Congressional Add: Mobile unmanned/manned distributed lethality airborne network joint capability FY 2022 Accomplishments: N/A FY 2023 Plans: FY23 Plans: FY23 MUDLAN CONAD funds continue NRE, surrogate and UAS testing of MATI systems, and development of fully developed Engineering Change Proposals (ECPs) for incorporation into other Government Programs and Projects. Phase 2 will ensure MIL-STD adherence of the MATI components, incorporation of encryption topology and systems for the MATI System and obtain certification from NSA for the encryption topology/ systems.	0.000	10.000
Congressional Adds Subtotals	17.000	10.000
C. Other Program Funding Summary (\$ in Millions) N/A		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0304240M / Advanced Tactical Unmanned Aircraft System	Project (Number/Name) 9999 / Congressional Adds
C. Other Program Funding Summary (\$ in Millions)		
Remarks		
D. Acquisition Strategy		
<p>The MUDLAN/MATI (MANGL advanced technology insertion) experimentation will leverage MUDLAN Joint Capability Technology Demonstration and MUDLAN Small Business Innovation Research prior efforts. The use of Small Business contractors, the effort will focus on continued innovation of antenna, radio and networking capabilities. Experimentation and maturation will continue to inform end user operational requirements and build on USMC, Joint service, OSD(R&E) successes. Transition will occur through future acquisition plans once the hardware is mature and the Joint service requirements are validated to enable follow-on fleet integration.</p> <p>The ULS-A demonstration will be combined with the current unmanned logistics capability and will support planned demonstrations associated with CQ-24A (KMAX) as part of a Cooperative Research and Development Agreement (CRADA) between the Navy and industry partners.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy													Date: March 2023		
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0304240M / Advanced Tactical Unmann ed Aircraft System				Project (Number/Name) 9999 / Congressional Adds					
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CONOPS, Interface Control Documents	WR	NAWCAD : Patuxent River, MD	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	-
MUDLAN Pod development and flight demonstration	C/CPIF	Various : Various	6.400	1.500	Aug 2022	0.000		0.000		-		0.000	0.000	7.900	-
MUDLAN communications equipment and demonstrations	C/CPIF	Various : Various	8.150	0.000		0.000		0.000		-		0.000	0.000	8.150	-
ULS-A Experimentation	Various	USAF : Rome, NY	20.444	0.000		0.000		0.000		-		0.000	0.000	20.444	-
ULS-A Requirements and analysis, and engineering assessments	WR	NAWCAD : Patuxent River, MD	1.342	0.000		0.000		0.000		-		0.000	0.000	1.342	-
FINN Dev	Various	USAF : WPAFB	2.500	0.000		0.000		0.000		-		0.000	0.000	2.500	-
K-MAX Unmanned Logistics System	Various	USAF : Rome, NY	0.000	7.000	Jun 2022	0.000		0.000		-		0.000	0.000	7.000	-
MQ-9 Multi-mode radar pod	Various	AFRL : Dayton, Ohio	0.000	5.000	Jul 2022	0.000		0.000		-		0.000	0.000	5.000	-
MUDLAN unmanned/ manned distributed lethality airborne network joint capability	C/CPIF	AFRL : Rome, NY	0.000	0.000		9.600	Aug 2023	0.000		-		0.000	0.000	9.600	-
Subtotal			39.336	13.500		9.600		0.000		-		0.000	0.000	62.436	N/A
Support (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Logistics Support	Various	Various : Various	2.333	0.000		0.000		0.000		-		0.000	0.000	2.333	-
Subtotal			2.333	0.000		0.000		0.000		-		0.000	0.000	2.333	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity 1319 / 4						R-1 Program Element (Number/Name) PE 0304240M / <i>Advanced Tactical Unmanned Aircraft System</i>						Project (Number/Name) 9999 / <i>Congressional Adds</i>			
Test and Evaluation (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	Various	Various : Patuxent River, MD	2.100	0.000		0.000		0.000		-		0.000	0.000	2.100	-
Operational Test & Evaluation (OT&E)	Various	Various : Patuxent River, MD	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	-
Subtotal			2.600	0.000		0.000		0.000		-		0.000	0.000	2.600	N/A
Management Services (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Various	Various : Various	1.616	0.850	Aug 2022	0.400	Aug 2023	0.000		-		0.000	0.000	2.866	-
Government Engineering Support	WR	NAWCAD : Patuxent River, MD	2.965	2.500	Aug 2022	0.000		0.000		-		0.000	0.000	5.465	-
Travel	WR	NAWCAD : Patuxent River, MD	0.150	0.150	Aug 2022	0.000		0.000		-		0.000	0.000	0.300	-
Subtotal			4.731	3.500		0.400		0.000		-		0.000	0.000	8.631	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			49.000	17.000		10.000		0.000		-		0.000	0.000	76.000	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy														Date: March 2023																											
Appropriation/Budget Activity 1319 / 4														R-1 Program Element (Number/Name) PE 0304240M / Advanced Tactical Unmann ed Aircraft System								Project (Number/Name) 9999 / Congressional Adds																			
Proj 9999														FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
														1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
MUDLAN/ MATI														Requirements / CONOPS																											
														Pod development																											
														Tech Maturation and prototyping																											
														Flight Technical Demonstrations																											
																Pod development																									
ULS-A														ULS-A Experimentation																											
														ULS-A assessments																											
K-max																K-MAX Experimentation																									
MQ-9																MQ-9 Rader Pod																									
MUDLAN/ MATI unmanned/manned distributed lethality airborne network joint capability																			Pod development																						
2024PB - 0304240M - 9999																																									

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy

Date: March 2023

Appropriation/Budget Activity

1319 / 4

R-1 Program Element (Number/Name)

PE 0304240M / Advanced Tactical Unmanned Aircraft System

Project (Number/Name)

9999 / Congressional Adds

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 9999				
MUDLAN/ MATI: Requirements / CONOPS	1	2022	4	2022
MUDLAN/ MATI: MUDLAN Pod development	1	2022	4	2022
MUDLAN/ MATI: Maturation and prototyping of key MUDLAN communications equipment and demonstrations (MATI)	1	2022	4	2022
MUDLAN/ MATI: MUDLAN Flight Technical Demonstrations	1	2022	4	2022
MUDLAN/ MATI: MUDLAN Pod development and flight demonstration	3	2022	4	2023
ULS-A: ULS-A Product Development	1	2022	4	2022
ULS-A: ULS-A Requirements and Engineering Assessments	1	2022	4	2022
K-max: K-MAX Unmanned Logistics System	3	2022	4	2023
MQ-9: MQ-9 Multi-mode radar pod	3	2022	4	2023
MUDLAN/ MATI unmanned/manned distributed lethality airborne network joint capability: MUDLAN Pod development and flight demonstration	2	2023	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
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Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy</i> / BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>					R-1 Program Element (Number/Name) PE 0304270N / <i>Electronic Warfare Development - MIP</i>							
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
Total Program Element	7.375	0.506	0.796	1.250	-	1.250	1.392	1.411	1.426	1.467	Continuing	Continuing
2260: <i>Specific Emitter ID</i>	7.375	0.506	0.796	1.250	-	1.250	1.392	1.411	1.426	1.467	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project supports systems development and collection of Specific Emitter Identification (SEI) information from National Technical Means (NTM) to track commercial ships over 200 gross registered tons world-wide. Research and development will cover improvements and enhancements to Electronic Intelligence technology. This will include improved/next generation SEI technology for miniaturization and automation of hardware, national collection systems, signal processing and analysis, and de-interleaving of signals. Propagation in a multi-path signal environment will also be assessed. All work on this project will be undertaken in pursuit of goals stated by the Office of Naval Intelligence and the National Security Agency in support of the Worldwide Ship Tracking Program.

Advanced Component Development and Prototypes (ACD&P) efforts necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment are funded in this Program Element (PE). Most of the work in this PE can be classified between Technology Readiness Level (TRL) 6 (system/subsystem model or prototype demonstration in a relevant environment) and TRL 7 (system prototype demonstration in an operational environment).

This PE is a Military Intelligence Program (MIP).

B. Program Change Summary (\$ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	0.506	0.796	0.680	-	0.680
Current President's Budget	0.506	0.796	1.250	-	1.250
Total Adjustments	0.000	0.000	0.570	-	0.570
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	0.570	-	0.570

Change Summary Explanation

Funding: \$570K increase for projected increase in labor and research costs.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0304270N / Electronic Warfare Development - MIP	
Technical: No significant change Schedule: No significant change		

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy										Date: March 2023		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0304270N / <i>Electronic Warfare Development - MIP</i>				Project (Number/Name) 2260 / <i>Specific Emitter ID</i>			
COST (\$ in Millions)	Prior Years	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
2260: <i>Specific Emitter ID</i>	7.375	0.506	0.796	1.250	-	1.250	1.392	1.411	1.426	1.467	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
This project supports systems development and collection of Specific Emitter Identification (SEI) information from National Technical Means (NTM) to track commercial ships over 200 gross registered tons world-wide. Research and development will cover improvements and enhancements to Electronic Intelligence technology. This will include improved/next generation SEI technology for miniaturization and automation of hardware, national collection systems, signal processing and analysis, and de-interleaving of signals. Propagation in a multi-path signal environment will also be assessed. All work on this project will be undertaken in pursuit of goals stated by the Office of Naval Intelligence and the National Security Agency in support of the Worldwide Ship Tracking Program.												
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)								FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: Sensor Fusion Articles: Description: This effort supports systems development and information fusion of improved Specific Emitter ID (SEI) technology for automation of hardware, national collection systems, signal processing and analysis, and de-interleaving of signals. FY 2023 Plans: - Continue development of advanced technologies to improve signal processing, signal characterization, de-interleaving of signals, and sensor fusion for national collection systems, which employ SEI technology. FY 2024 Base Plans: - Continue development of advanced technologies to improve signal processing, signal characterization, de-interleaving of signals, and sensor fusion for national collection systems, which employ SEI technology. FY 2024 OCO Plans: N/A FY 2023 to FY 2024 Increase/Decrease Statement: There is no significant funding change from FY 2023 to FY 2024								0.130	0.207	0.325	0.000	0.325
								-	-	-	-	-
Title: System Automation								0.200	0.317	0.500	0.000	0.500
Articles:								-	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023		
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0304270N / <i>Electronic Warfare Development - MIP</i>		Project (Number/Name) 2260 / <i>Specific Emitter ID</i>	
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
<p>Description: This effort supports development of an autonomous surveillance system capable of providing emitter signal information to a central location.</p> <p>FY 2023 Plans:</p> <p>- Continue development of technologies for an autonomous surveillance system that provides emitter signal information to a central location. Continue development of improvements and automation of Specific Emitter Identification certification hardware and software.</p> <p>FY 2024 Base Plans:</p> <p>- Continue development of technologies for an autonomous surveillance system that provides emitter signal information to a central location.</p> <p>- Continue development of improvements and automation of Specific Emitter Identification certification hardware and software.</p> <p>FY 2024 OCO Plans:</p> <p>N/A</p> <p>FY 2023 to FY 2024 Increase/Decrease Statement:</p> <p>There is no significant funding change from FY 2023 to FY 2024</p>					
<p>Title: Technology Refresh and Communication Enhancement</p> <p style="text-align: right;">Articles:</p> <p>Description: This effort improves Specific Emitter ID (SEI) system performance, real-time communication and tactical use of SEI which will be expanded with next generation SEI technology.</p> <p>FY 2023 Plans:</p> <p>- Continue improving next generation SEI system performance through developmental improvements in SEI hardware, software and real-time communications. Continue evaluations of new SEI hardware subsystems for improved SEI system performance.</p> <p>FY 2024 Base Plans:</p> <p>- Continue improving next generation SEI system performance through developmental improvements in SEI hardware, software and real-time communications.</p> <p>- Continue evaluations of new SEI hardware subsystems for improved SEI system performance.</p> <p>FY 2024 OCO Plans:</p>	0.176 -	0.272 -	0.425 -	0.000 -	0.425 -

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Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy			Date: March 2023			
Appropriation/Budget Activity 1319 / 4		R-1 Program Element (Number/Name) PE 0304270N / <i>Electronic Warfare Development - MIP</i>		Project (Number/Name) 2260 / <i>Specific Emitter ID</i>		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A						
FY 2023 to FY 2024 Increase/Decrease Statement: There is no significant funding change from FY 2023 to FY 2024						
Accomplishments/Planned Programs Subtotals		0.506	0.796	1.250	0.000	1.250
C. Other Program Funding Summary (\$ in Millions)						
N/A						
Remarks						
D. Acquisition Strategy						
Not applicable.						

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy												Date: March 2023			
Appropriation/Budget Activity						R-1 Program Element (Number/Name)					Project (Number/Name)				
1319 / 4						PE 0304270N / <i>Electronic Warfare Development - MIP</i>					2260 / <i>Specific Emitter ID</i>				
Product Development (\$ in Millions)				FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
NRL	TBD	Not Specified : Not Specified	7.375	0.506	Jan 2022	0.796	Jan 2023	1.250	Jan 2024	-		1.250	Continuing	Continuing	Continuing
Subtotal			7.375	0.506		0.796		1.250		-		1.250	Continuing	Continuing	N/A
			Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			7.375	0.506		0.796		1.250		-		1.250	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy																						Date: March 2023						
Appropriation/Budget Activity 1319 / 4											R-1 Program Element (Number/Name) PE 0304270N / <i>Electronic Warfare Development - MIP</i>								Project (Number/Name) 2260 / <i>Specific Emitter ID</i>									
Proj 2260	FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Demonstration																												
	Installation and Testing																											
2024DON - 0304270N - 2260																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0304270N / <i>Electronic Warfare Development - MIP</i>	Project (Number/Name) 2260 / <i>Specific Emitter ID</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Proj 2260</i>				
Demonstration: Installation and Testing	1	2022	4	2024