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USAF PLANS AND POLICIES

LOGISTICS AND BASE CONSTRUCTION

IN SOUTHEAST ASIA

1967

by

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FOREWORD

USAF Plans and Policies: Logistics and Base Construction in Southeast Asia, 1967 is the latest in a series of historical studies on the war in Vietnam prepared by the USAF Historical Division Liaison Office (AFCHO). The author examines the overall logistic problems facing the Air Force in 1967 as it undertook to prepare for a war of seemingly indeterminate length. He also reviews the steps taken to improve the Air Force's munitions situation, Southeast Asia base construction, and high-level planning for construction of an anti-infiltration system across South Vietnam and Laos, which would require special USAF support facilities, equipment, and personnel.

Previous AFCHO studies on the war effort include: USAF Plans and Operations: The Air Campaign Against North Vietnam, 1966; USAF Deployment Planning for Southeast Asia, 1966; USAF Logistic Plans and Policies in Southeast Asia, 1966; USAF Logistic Plans and Policies in Southeast Asia, 1965; USAF Plans and Policies in South Vietnam and Laos, 1964; and USAF Plans and Policies in South Vietnam, 1961-1963.

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I. LOGISTICAL PLANNING FOR PROLONGED WAR

During 1966 Secretary of the Air Force Harold Brown and USAF Chief of Staff Gen. John P. McConnell expressed their concern over the character and indeterminate nature of the war in Vietnam.* It had become clear that the war would continue for some time at higher levels of intensity and posed serious problems for the Air Force, many of a logistical nature.

In May 1967 Secretary Brown observed that the war in Vietnam had "no close parallel in our military history...While it is a small war compared to World War II, it's an expensive one with tremendous logistical problems."[1] This pointed to the essential dichotomy of Vietnam--it was a small war when compared militarily with previous world wars, but logistically it was very much a large war. It was exceedingly expensive to move vast quantities of materiel and large numbers of troops through a 10,000-mile pipeline that terminated in a country which possessed few if any of the facilities to receive them. An entire logistic base had to be built while simultaneously the United States supplied its fighting forces essential equipment and facilities.+ Under these circumstances it was not surprising that displacement, maldistribution, and shortages occurred.

(U) Prior to 1967, Secretary of Defense Robert S. McNamara noted, it proved very difficult to determine the dimensions of military requirements with any kind of accuracy:[2]

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* See Herman S. Wolk, USAF Logistic Plans and Policies in Southeast Asia, 1966 (AFCHO, 1967).

\+ U.S. plans (Program #5) called for deploying 525,000 troops to Vietnam by the end of June 1968.

> There was at that time a wide range of uncertainty concerning the size of forces required, their composition, and their tempo of operation...we could not determine with any degree of precision...how much more ammunition and other supplies we would consume, how many more aircraft we would lose...and how much more construction we would need in Vietnam and elsewhere to support the larger forces that might be required.

([redacted] In 1967, then, Headquarters USAF logistic planning proceeded on the basis that the war would be an extended conflict. To a greater extent than previously--in view of the widening scope of the war--Southeast Asia (SEA) operations became increasingly dependent upon efficient logistic support which, in turn, relied on the responsiveness of the U.S. industrial base. For example, the accelerated tempo of war required greater expenditures of a wide range of conventional munitions which meant increased production, timely air and sea transportation, additional storage facilities, and more personnel to handle them. Also, in late 1966 and in 1967, the Air Force--in accordance with Office of the Secretary of Defense (OSD) directives--took steps to provide air support for an anti-infiltration system, which required a considerable logistic base. Finally, there was the requirement to complete the new USAF Southeast Asia air base network during 1967, which work included expansion of USAF facilities at U-Tapao AB, Thailand, to accommodate B-52 operations.

([redacted] OSD's war production policy was generally aimed at supporting U.S. forces from a "warm" production base without accumulating large stockpiles. Thus, when hostilities ceased, there would be no large surpluses. According to OSD, this approach would enable industry to respond to rapidly changing requirements and also to innovations in research and development. On the other hand, Headquarters USAF--given previous unanticipated accelerations in air operations and the probability of future expansion of war requirements--felt that the margin of safety provided by OSD's policy was, in some

areas (particularly munitions and aircraft) too narrow. It believed if another crisis arose elsewhere in the world and demanded a rapid and significant U.S. response, the current six months of lead time for munition production might prove inadequate.[3]

Aircraft Production and Attrition

([redacted] During fiscal year 1966 the Air Force accepted delivery of 242 F-4's and had 518 scheduled for delivery in fiscal year 1967 and 366 in fiscal year 1968. Three A-7's were scheduled for delivery in 1968 (none in 1966 or 1967); F-111's, 13 in 1967 and 73 programmed for 1968; RF-4's, 124 delivered in 1966, 107 scheduled for 1967 and 72 in 1968; and RF-101's, seven delivered in 1966, 49 slated for 1967, and five for 1968. In addition, 18 modified A-37's would be provided in fiscal year 1967 and another 21 in fiscal year 1968.*[4]

[redacted] USAF fighter attrition by selected aircraft type was estimated as follows:+[5]

Fighter & Attack	FY 1966			FY 1967			FY 1968		
	SEA	Other	Total	SEA	Other	Total	SEA	Other	Total
A-1	38	--	38	49	2	51	42	--	42
B-57	13	1	14	12	1	13	14	--	14
F-4	28	9	37	79	12	91	127	26	153
F-100	24	32	56	48	40	88	56	36	92
F-104	4	10	14	16	15	31	4	11	15
F-105	96	19	115	174	16	190	130	12	142
RF-4	1	1	2	21	2	23	32	5	37
RF-101	13	7	20	18	3	21	12	3	15

*During fiscal years 1966-68 about 5,200 aircraft were scheduled to come off production lines compared to more than 14,000 during the Korean War. More than half of the aircraft produced in both wars were fighter/attack planes. /See Rprt (S), SEA Analysis, Feb 67, by Asst SECDEF (I&L)/

+Aircraft losses by Viet Cong attacks on USAF bases through mid-July 1967 were exactly equal to losses suffered due to enemy surface-to-air missiles (SAM's) and were twice as great as attrition by MIG attack. /See Rprt (S), SEA Statistical Review, Comptroller of AF, Dir/Mngt Analysis, Aug 67/

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AIRCRAFT LOSSES IN SOUTHEAST ASIA VS USAF INVENTORY

TYPE AIRCRAFT LOST	SEA LOSSES FY 62 31 Dec 67	31 Dec 67 ACT & IA INV TOTAL	USAF WORLDWIDE INVENTORY (COMMAND POSSESSED)																			ANG
			ACTIVE AIRCRAFT														INACTIVE AIRCRAFT					
			PAF	TAC	AFE	ADC	SAC	LOG	SYS	MAC	ATC	SOU	HQC	AU	AAC	CAC	PAF	LOG	AFE	SYS	CSV	
A-26A	8	29	15	9								5										
A-1E/G/H	90	137	68	38				25										6				
AC-47D	12	34	28	6																		
A-37A	2	37	25	10					2													
B-26B	10	6									1							5				
B-52F	5	82					73		1									8				
B-57B,C,E	46	58	47			5		1	5													
C-7	3	132	91	18				17										6				
C-47D	5	175	56	26	19	5	22	3	6	2	8	19		1				8				1
C-123B/K	31	165	75	63	5			10	2									10				
C-130A/B/E	27	573	234	223	40			2	29	35		6	4									
C-141	2	278							7	271												
CH-3C/E	3	64	18	1			3	5	6	14	15	2										
F-4C/D	166	1132	316	459	288			18	51													
F-5C/D	9	6		6																		
F-100D/F	90	728	245	235	214	1		9	20		2							2				18
F-102A	11	275	79		85	81		4							26							347
F-104C	14	11							11													
F-105D/F	308	324	166	130				12	14		2											
HH-43B/F	7	157	43	1	30	5		1		67	10											
HH-3E	6	22	15					2	2	3												
HU-16B	3	34	11		3	4	1		1	11								3				17
KB-50	1	-																				
O-1E/F/G	114	223	188	35																		
O-2A/B	7	181	138	9					34													
RB/EB-57	1	50	13		2	19		2		12					2							1
EC-47	3	51	49						2													
RB/EB-66	6	99	35	32				6										26				
RF-4C	30	293	96	113	72			8	4													
RF-101C	37	75	21	18	33			3														
T-28D	21	25	9	7				1				8										
U-10B	7	35	16	6	2							10					1					
U-2	1	-	(Inventory Not Available)																			
U-6	1	18	3	4	4		2		2						2			1				23
UC-123B	3	28	24	4																		
UH-1F	3	112	17	2			78	2	8			3	2									
TOTAL	1093[1]	5649	2141	1455	797	120	179	131	207	415	38	53	6	1	30	0	1	75	0	0	0	407

[1] 32 aircraft lost since 31 Dec 67.

EB-66 - 1 [redacted] F-4D - 5 [redacted] O-1 - 1 O-2 - 1 A-1 - 1 RF-4C - 2 [redacted] HH-3 - 1 [redacted]

Inventory Source: 2-AF-A1

[redacted]

(S) Since mid-1966 its authorized production schedule had been a matter of concern to Headquarters USAF because it did not provide an attrition aircraft reserve. This matter was brought to the attention of the Defense Chief on 1 August 1966 by Secretary Brown, who suggested that--lacking an attrition reserve--the so-called command support or maintenance pool be enlarged above the approved figure of 10 percent. To support this recommendation, Headquarters USAF subsequently initiated a study to determine the adequacy of the 10 percent command support factor.* [6]

(S) This analysis, covering a six-month period, indicated that the ratio of actual non-operating active (NOA) aircraft to operating active (OA) planes was 17 percent for the entire USAF inventory, while for Southeast Asia it was 25 percent. Secretary Brown noted that this was "considerably above" the USAF programmed NOA factor. Within aircraft types and class, there was a wide variance in the ratios which took into account modifications, conversions, etc. The following indicated the specific USAF NOA/OA ratios for November 1966-April 1967: [7]

	1966		1967			
	Nov	Dec	Jan	Feb	Mar	Apr
Worldwide	.15	.15	.16	.17	.17	.17
SEA	.20	.23	.23	.23	.24	.25

(S) According to Secretary Brown, these figures showed that increased SEA operational demands made the traditional 10 percent peacetime allowance obsolete because of the greater aircraft flow to and from repair facilities during wartime. Consequently, he backed a Joint Chiefs of Staff (JCS) recommendation to Mr. McNamara that command support be

*The 10 percent figure was the expected ratio of non-operating active to operating active aircraft. The NOA rate included aircraft in modification, conversion, inspection repair as necessary (IRAN), pipeline, or otherwise removed from the operating unit's possession.

increased to a maximum of 20 percent on an interim basis. He noted that, although the Air Force had been authorized only 10 percent, the Navy's authorization was 20 percent.[8]

([redacted]) However, on 22 June 1967 Secretary McNamara--in providing logistical guidance for fiscal year 1968--reiterated that no aircraft attrition reserve would be procured.[9] The Joint Chiefs--while later agreeing that an aircraft stockpile for a wartime attrition reserve was not economically feasible--pointed out that procurement of a lesser number of aircraft as a reserve might be appropriate to reduce "the risk in our readiness posture to a more acceptable level." In addition, the JCS observed pointedly that this kind of procurement "could contribute toward a continuing military capability during wars of indefinite duration."[10]

([redacted]) Mr. McNamara, however, rejected these arguments and on 13 December 1967 he reiterated that no combat attrition reserve of aircraft would be bought. At the same time, he authorized advance procurement of reserves for the estimated peacetime attrition for "buy-out" programs.* [11]

War Readiness Materiel (WRM) Policy

([redacted]) War readiness materiel was defined as those items needed to support the forces and missions approved in the USAF Wartime Guidance (WG) and Wartime Requirements (WR) documents. These included spares, repair parts, station sets, housekeeping sets, petroleum, oil, and lubricants (POL), rations, and air transportable housekeeping equipment ("Harvest Eagle"),+ etc.

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*Buy-out programs referred to those aircraft in production that had already been bought, thus closing production of a specific model.

+Formerly known as "Gray Eagle," the new designation was adopted in December 1967.

It was Air Force policy to co-locate WRM with the using unit whenever possible or to have the materiel readily available in case of need.[12]

(S Sp ...) The fundamental WRM objective was to support USAF tactical forces from the beginning of hostilities until U.S. political or military objectives were achieved. In 1965--at the time of the major buildup in Southeast Asia--the Air Force lacked specific guidance on the expected duration and extent of hostilities and consequently had considerable difficulty determining its requirements. By 1967 however, Headquarters USAF had adopted a war readiness materiel policy rooted in the assumption that the conflict would continue indefinitely. This policy--outlined in the WG, WR, War Consumable Distribution Objectives (WCDO) documents and in Air Force Regulation (AFR) 67-44--reflected OSD logistic guidelines and decisions.

(S Sp ...) On 15 August 1966 for example, Mr. McNamara advised the service secretaries and the Chairman, JCS, that he was revising previous policy which had called for 180 days war readiness support of nonnuclear forces in combat consumables. His new guidance--incorporated in the Headquarters USAF May 1967 WG document along with the "Fiscal Year 1968 Buying and Fiscal Year 1969 Budget Letter" of 17 April 1967--established the logistical support objective as follows:[13]

> (1) Combat forces designated for NATO /North Atlantic Treaty Organization/ with full equipment, nonnuclear ammunition, combat consumables and secondary items for 90 days.
>
> (2) Non-NATO forces with full equipment and other principal items for six months and ammunition, other combat consumables and secondary items for a conflict of indefinite duration....

Noteworthy in this revised WRM policy was the decision to provide support for non-NATO nonnuclear forces "for a conflict of indefinite duration." OSD's policy affected all forces in the approved five-year defense program (FYDP).[14]

(S-Gp-4) Combat logistic support for nonnuclear operations was predicated on the following assumed conditions: that 80 B-52/FB-111's and 800 tactical fighters (non-NATO) would become involved in a war of indefinite duration. As far as sorties were concerned, support would be based on 4,800 B-52 and 201,000 tactical fighter sorties of which 188,000 would be attack (air-to-ground), and 13,000 air-to-air. These figures represented a substantial increase for the Air Force over the 165,000 sorties specified in fiscal year 1967.[15]

(S-Gp-4) The above-listed sorties were expected to support non-NATO forces in a nonnuclear war until production equaled consumption (the period known as the D to P interval).* This computation included consideration of the production base, pipeline, and operating and safety levels of SEA forces. Thus, according to OSD guidance, "the only additional support that should be required as long as the production base exists is that required to sustain the forces/sorties in excess of SEA activity and for those items which are currently not in production for SEA."[16]

(S-Gp-4) In general, the Air Force felt the McNamara revisions in logistic guidance were a significant improvement over that of previous years. When the JCS subsequently proposed a change in support from 90 to 180 days

*The "D" denoted the beginning of conflict and the "P" the day when production matched consumption.

for NATO-oriented U.S. forces for 1969, the Air Force disagreed.[17] The view of the other services, which on this point was the same they had taken earlier, was that[18]

> there is no new reason to change the previous position of the JCS that procurement objectives for U.S. forces oriented toward Europe should be increased from 90 to 180 days. The JCS have stated that...Allied shortfalls do not justify the failure to provide essential support for U.S. forces and the logistic capability must be sufficient to sustain committed U.S. forces until resupply from the CONUS /Continental United States/ can be established.

(S) Although the above JCS recommendation went forward to Mr. McNamara, the Secretary of the Air Force nonconcurred and argued for the lower figure. This was consistent with the Headquarters USAF position outlined on 6 March 1966.[19] According to the Air Staff, a change from 90 to 180 days support would be inconsistent with NATO strategy and "with the military/political/economic realities existing today in Europe and the United States."[20] Perhaps the primary USAF argument was that the United States could not expect to fight a major, sustained conventional war in Europe without substantial participation by its NATO Allies. This would require a large and expensive buildup of Allied conventional forces which the Air Force felt was unlikely. Also, the Air Force believed that the probability of the nation fighting simultaneous major conventional wars in two theaters was "extremely remote."[21]

Consumables, Spares, and Engines

(S) Through 1967 the Air Force supported the SEA buildup by establishing a full stock of consumables and spare parts for each new base supply and equipment account. During the year USAF aircraft deployed to the theater increased to a total of 1,614 (71 squadrons), a gain of almost

500 planes over 1966. In the same period the number of line items increased from 809,294 to 1,244,000 and the number of monthly supply transactions rose from 1,942,988 to 3,465,000.[22]

(S-Gp-4) Each unit scheduled to be deployed to Southeast Asia was authorized a war readiness spares kit (WRSK)--designed to support the first 30 days of conventional war. In-place war readiness materiel and production resources would support tactical forces for subsequent nonnuclear operations. As of 30 June 1967, the USAF spares and repair parts inventory equaled a dollar value of $5.058 billion, with spares and repair parts on order totaling $720 million. Due to the SEA buildup, between 1965 and mid-1967 the total dollar value of the USAF inventory increased from $26.3 billion to more than $30 billion.[23]

(Gp-4) One of the most serious support problems that confronted the Air Force during 1967 was a growing shortage of J75-19W engine repair parts for F-105 aircraft. Early in the year 46 of the 65 J75 spare engines supporting the F-105 fleet were unserviceable because of this deficit. The primary critical engine components were N-2 compressors and turbine wheels which required modifications in order to reduce malfunctions. These changes were eventually made during the year and deliveries of spare parts and engines to Southeast Asia were accelerated. Also, spare parts production was expedited and a special maintenance team was dispatched to the Pacific to help repair the J75 engines in the field. By late 1967, as a result of these actions, the J75 problem was partially resolved.[24]

II. AIR MUNITIONS

(S) The USAF munitions situation improved considerably during 1967 over the previous year. Although the weight of the air effort greatly increased, more conventional munitions were produced and many previous deficits were overcome or ameliorated. In 1966, Secretary Brown admitted, the Air Force had had difficulty supplying the correct type of ordnance in the desired amount. There were times, he testified before the Senate, when "we have not had the most desirable mix of bombs and ammunition on a given base at a given time."[1] In the spring of 1966, for example, a significant number of USAF strike sorties were cancelled because of the air munitions shortage.* However, accelerated production and improved munitions control eased the problem late in 1966 and early 1967.

(S) This meant that some munitions could be distributed to both the European and Pacific theaters to rebuild the war readiness materiel base which had been "drawn down" during 1965 and 1966 to meet SEA needs. Also, the Air Force was able to replace some of the older munitions in its inventory with modern ordnance. By January 1968, only two categories of munitions--the Shrike missile and Cluster Bomb Unit (CBU) 24/29--remained in the automatic resupply system (i.e., items being shipped directly from the

*See Herman S. Wolk, USAF Logistic Plans and Policies in Southeast Asia, 1966 (AFCHO, 1967), p 14. During congressional testimony, Secretary McNamara commented: "Considering the fact that we had to construct a complete infrastructure starting with ports and airfields and extending to roads, bridges, warehouses, maintenance facilities, communications, etc. --and simultaneously move in the ammunition and supplies--it is not surprising that there were scattered supply pinches during the initial period of the buildup. But as our commanders have stated, even then there were no shortages which adversely affected our combat operations or the morale or welfare of our men." [Statement of Mr. McNamara before House Subcomm on Appropriations 90th Cong, 1st Sess, 20 Feb 67, in DOD Appropriation for 1968, Part II, p 19]

United States production line).[2] The greatest improvement took place during the second half of 1967, when the flow of air munitions reached the point where Southeast Asia operations could be supported close to optimum levels.[3]

(S [redacted]) Total SEA air munitions expenditures during 1967 came to 681,708 tons, a very substantial increase over the 1966 total of 364,381 tons. The monthly expenditures were as follows:

USAF AIR MUNITIONS EXPENDITURES (TONS) IN SOUTHEAST ASIA, 1967

	PACAF (SEA)			SAC			MAP	TOTAL
	Expended	Sorties	Tons Per Sortie	Expended	Sorties	Tons P.Sor	Expended	
January	26,706	15,461	1.73	15,211	735	20.70	3546	45,463
February	25,920	14,478	1.79	19,802	706	28.05	3753	49,475
March	31,825	17,284	1.84	22,135	810	27.33	4033	57,993
April	30,969	16,669	1.86	21,204	823	25.76	4037	56,210
May	29,829	16,513	1.81	21,002	808	25.99	4503	55,334
June	30,883	15,983	1.93	21,195	832	25.47	4496	56,574
July	30,812	16,714	1.84	21,935	836	26.24	3853	56,600
August	31,443	16,960	1.85	23,509	832	28.26	3253	58,205
September	29,984	16,505	1.82	25,092	833	30.12	3159	58,235
October	33,400	17,349	1.93	25,391	847	29.98	3647	62,438
November	34,183	17,054	2.00	24,496	816	30.02	3882	62,561
December	33,597	17,458	1.92	25,280	808	31.29	3743	62,620
TOTAL	369,551	198,428	1.86	266,252	9686	27.49	45,905	681,708

SOURCE: Dir/Supply & Svces Chart, Jan 1968, subj: Airmunitions Expenditures/Allocation

(S-[redacted]) During September 1967 cumulative munitions expenditures for Southeast Asia passed the one million ton mark with almost half of this total (494,000 tons) consumed during the first nine months of 1967.* Incredibly enough, the amount of air munitions expended between January-September 1967 surpassed (by about 40,000 tons) the munitions used during the entire Korean War. And if fiscal year 1968 plans were carried out, the total air munitions used during the Vietnam War would exceed consumption in the European theater during World War II and would equal over three-fourths of the global expenditures of the Second World War.[4]

Production

([redacted]) USAF munitions production not only reflected the great increase in expenditures, but also the substantially improved situation over 1965 and 1966. Prior to the major U.S. force buildup in early 1965, conventional munitions production was extremely limited.+ For example, during fiscal year 1964 only 14,000 tons were delivered whereas during fiscal year 1967 the total was 706,000 tons. By December 1967 the U.S. production base was capable of producing over 800,000 tons of air munitions per year with 3-9 months lead time either for a production increase or conversion to new categories of munitions.[5]

([redacted]) As for production for all the services, the OSD approved air munitions schedule for fiscal year 1968 for selected items of ordnance was as follows:[6]

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*During January-September 1967, the M-117 and MK-82 general purpose bombs accounted for over three-quarters of the USAF expenditures.

+See Herman S. Wolk, USAF Logistic Plans and Policies in Southeast Asia, 1966 (AFCHO, 1967).

	Jul 67	Aug	Sep	Oct	Nov	Dec
MK-81 GP	37,100	23,800	33,200	34,600	45,000	54,000
MK-82 GP	56,100	70,800	83,400	109,000	105,000	127,000
M-117 GP	5,200	13,000	35,600	40,000	45,000	52,500
*BLU-23	11,700	20,800	19,400	19,300	17,300	5,000
BLU-1/27	24,800	20,500	19,900	22,000	24,700	11,300
MK-77	4,600	7,100	5,900	4,300	8,900	5,350
2.75 Rckt	89,000	191,000	207,000	260,000	220,000	216,000
+20-mm,F/M39	3,270	3,780	5,200	4,870	5,610	6,300
MK-24	92,600	120,000	92,800	127,000	131,000	135,000

	Jan 68	Feb	Mar	Apr	May	Jun
MK-81 GP	60,000	60,000	60,000	60,000	52,000	30,000
MK-82 GP	143,000	143,000	143,000	143,000	133,000	121,000
M-117 GP	60,000	62,500	65,000	70,000	75,000	75,000
BLU-23	1,300	0	0	0	0	0
BLU-1/27	10,900	12,600	15,700	12,000	10,000	4,000
MK-77	6,000	6,000	5,700	5,700	4,000	2,500
2.75 Rckt	216,000	296,000	296,000	246,000	242,000	210,000
20-mm,F/M39	6,600	7,800	7,800	7,800	5,800	4,000
MK-24	145,000	150,000	150,000	150,000	100,000	92,000

(S [redacted]) Thus, despite the substantial rise in expenditures, the USAF inventory continued to increase during 1967 because of the concomitant gain in the production base. The following illustrates the simultaneous rise in production, expenditures, and inventory (average per month):[7]

Thousands of Tons

	FY 1966	FY 1967	FY 1968
Production	11.5	59.2	71.6
Expenditures	24.5	43.6	64.6
SEA Inventory	67.6	132.8	140.0

It should be noted that data for the second half of fiscal year 1968 were predicated on production and allocation programs in progress at the close of 1967 and included support of 400 additional authorized B-52 sorties per month (from 800 to 1200) beginning in February 1968. With the increase in B-52 sorties, USAF inventory requirements to support the 1968 Pacific

*Bomb Live Unit

+In millions

Command (PACOM) expenditure plan would average 76,400 tons monthly with a concomitant 45-day stock level of 114,600 tons. As far as the first half of fiscal year 1969 was concerned, the programmed average monthly production was 72,900 tons with SEA expenditures of 76,400 tons and a forecasted inventory of 126,000 tons.[8]

(S-Gp 1) Actual USAF production during 1967 was as follows:[9]

Month	Thousands of Tons
January	66.1
February	65.7
March	69.9
April	66.2
May	68.3
June	65.4
July	65.6
August	68.5
September	71.0
October	73.8
November	65.6
December	72.4 (Estimated)

The effect of this production on the USAF inventory both worldwide and in Southeast Asia, despite increasing expenditures, could be appreciated from a consideration of the following comparative figures (tons) going back to 1965:[10]

Date	Worldwide Inventory	SEA Inventory	3-Month Expenditures
30 June 1965	342,064	49,513	31,711
30 Sep 1965	285,961	54,624	66,693
31 Dec 1965	252,872	67,177	68,362
31 Mar 1966	214,668	77,104	88,475
30 June 1966	218,039	71,655	79,064
30 Sep 1966	278,000	104,327	95,042
31 Dec 1966	342,079	140,250	109,793
31 Mar 1967	374,200	147,741	155,585
30 June 1967	403,121	133,977	171,482
30 Sep 1967	442,457	143,876	176,510
31 Dec 1967	464,131	166,455	191,110

(S-Gp 4) Southeast Asia logistic planning called for having 201,600 tons of munitions in the active pipeline, with another 100,800 tons in theater stocks. In Europe, where the Air Force had had but 28,000 tons of munitions on hand in October 1966, there also was a noteworthy improvement a year later. Total munitions on hand and en route came to more than 44,000 tons, with an additional 24,531 tons approved for shipment during late 1967 and early 1968.[11]

Old and New Munitions

([redacted]) As noted, accelerated production meant that the Air Force no longer had to rely on World War II and Korean War munitions. Before and during the U.S. buildup in 1965, the Air Force used twice as many older as modern air munitions. This situation began to change in fiscal year 1966 and even more so in fiscal year 1967. For example, whereas in May 1966 older munitions comprised 43.1 percent of the Seventh Air Force's inventory, in May 1967 this had decreased to 14.8 percent.* [12]

([redacted]) The following reflects the steady improvement during 1967 of the USAF SEA air munitions inventory as far as modern weapons were concerned:[13]

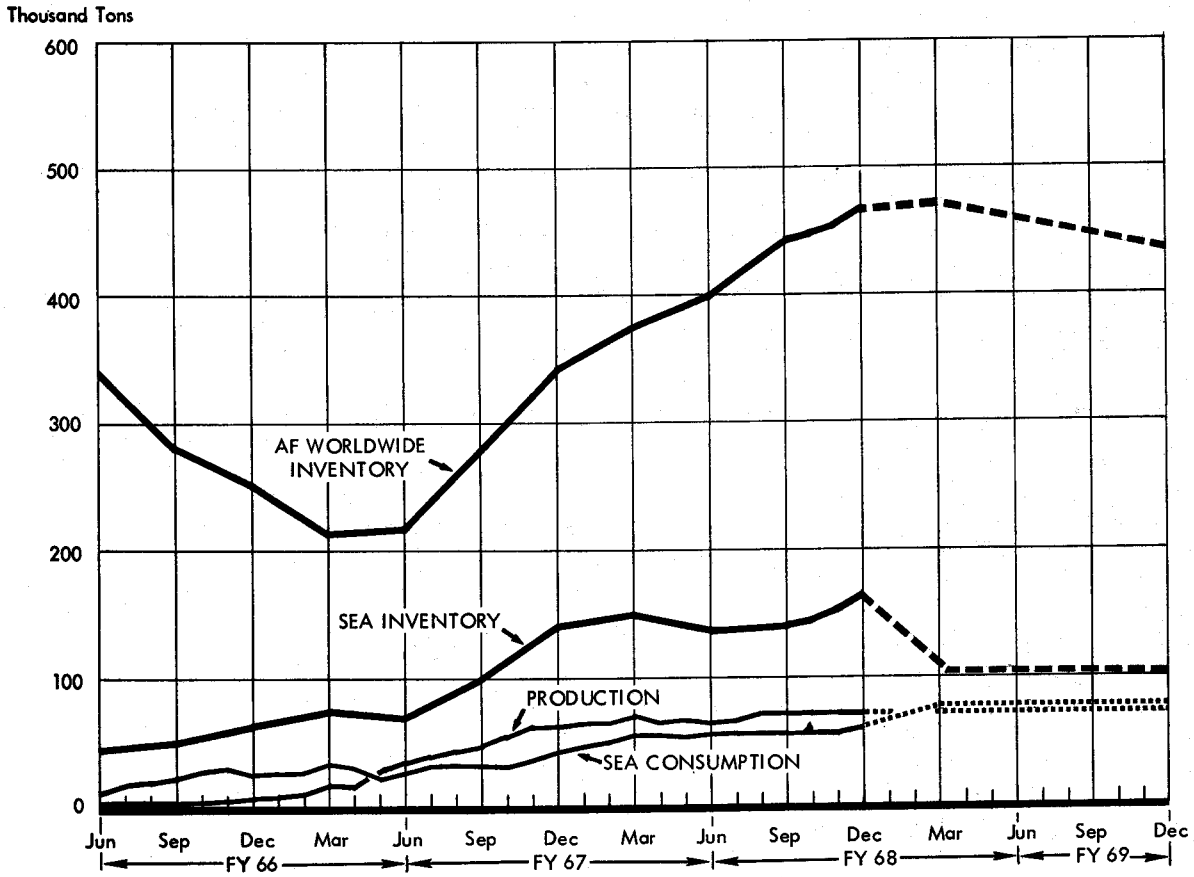
	31 March	30 April	31 May	30 June
Modern Weapons	83.5	85.6	86.2	88.9
Substitute Weapons	9.7	8.4	8.5	6.5
Old Weapons	6.8	6.0	5.3	4.6

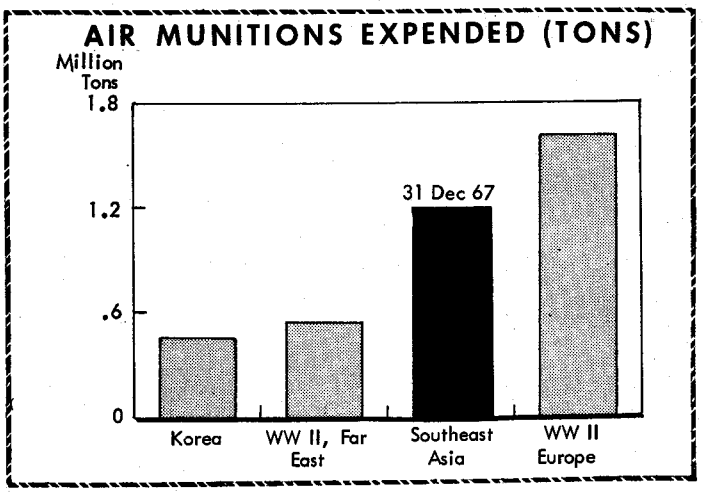
*Older munitions included the M-28, M-47, M-66, M-35, M-36, and the BLU-10. Substitute munitions comprised the M-30, M-57, M-64, M-65, M-81/82, M1A2, MLU-10, and the BLU-11/23/32. Modern air munitions included the MK-81, MK-82, MK-83, MK-84, M-117, M-118, BLU-31B, AIM-4, AGM-12, AGM-45, AIM-9B, BLU-1/27, MK-77/79, CBU-2, CBU-3, CBU-12, CBU-14, CBU-24/29, CBU-28, ADU-253, ADU-272, and the ADU-285.

[redacted]

19 Jan 68

AIR FORCE AIR MUNITIONS STATUS (TONS)
WORLDWIDE





[redacted]

(S) Strategic Air Command (SAC) B-52's, which were in large measure responsible for the greatly increased expenditure of munitions during 1967, were allocated MK-82 and MK-117 bombs after the inventory of older, surplus weapons, such as the M-65 1,000-pound general purpose bomb, had been reduced.[14] It is pertinent to note that in August 1967 the MK-82 500-pound and the M-117 750-pound general purpose bombs accounted for 83.7 percent of the tonnage used by the Seventh Air Force and SAC and for 71.9 percent of the total expended in the SEA theater (including the Laotian and Vietnamese Air Forces).[15]

(S) Among the most effective conventional air ordnance was the cluster bomb unit family of munitions. These CBU's contained hundreds of small bomblets which were especially effective in penetrating thick jungle foliage. The CBU-1A and the CBU-7A were anti-personnel weapons while the CBU-2A was an anti-materiel bomb. The CBU-24/29--developed especially for Southeast Asia--could be used as both anti-personnel and anti-materiel weapons. These bombs were carried by the F-4C/D/E, F-100, F-105, A-7 and other aircraft. Also, the BLU-3B and the BLU-26 anti-materiel munitions were developed for mass delivery by B-52 aircraft and the B-57B/D. Another new and useful munition was the Walleye air-to-surface missile for use against tactical targets.[16]

(S) The Air Force was also concerned about the availability and development of heaver bombs in the 2,000 and 3,000-pound range. A new 3,000-pound bomb--the BLU-34--was still in a research and development status. The USAF worldwide inventory of the M-118 3,000-pound general purpose bomb was low and required strict rationing in Southeast Asia to

[redacted]

26 Jan 68

ORDNANCE BY TYPE
SOUTHEAST ASIA
(QUANTITIES)
TOTAL USAF EXPENDITURES
(PACAF & SAC)

TYPE	ITEM	FY 65	FY 66	FY 67	FY 68
Aircraft Gun Ammunition (Thous Rds)	20 M/M (M3 Gun)	2,972	3,941	2,091	989
	20 M/M (M39 Gun)	1,830	15,235	16,602	8,298
	20 M/M (M61 Gun)	374	9,631	8,891	3,888
	7.62 M/M (SUU-11 Mini-Gun)	-	8,288	31,165	31,433
Flares	MK 24	78,180	245,575	492,734	232,540
	MLU-32/B (BRITEYE)	-	-	-	-
Bombs	Fire				
	100# M47 PWP	13,979	17,200	13,383	5,828
	250# BLU-10	1,963	9,449	6,387	500
	500# BLU-11/23/32	14,992	10,873	10,299	8,350
	750# M116/BLU-1/27	11,542	44,301	121,492	50,071
	General Purpose				
	100# M30	12,763	20,396	-	-
	250# M57	13,899	29,551	4,712	
	250# MK81	129	5,977	45,763	14,919
	500# M64	25,591	98,036	7,385	-
	500# MK82	-	45,928	528,656	502,802
	750# M117	27,683	282,315	383,387	343,351
	1000# M65	241	32,038	86,127	1,344
	1000# MK83	-	5,304	18,099	-
	2000# M66	-	42	1,109	156
	2000# MK84	-	1,755	1,847	17
	3000# M118	-	5,494	5,032	3,357
	3000# BLU-34	-	-	-	-
	Special Purpose				
	AGM-62 (WALLEYE)	-	-	-	22
	ADU-253/B	-	14,453	32,775	861
	ADU-272/B	-	-	2,141	4,228
	ADU-285	-	-	-	-
	CBU-2	393	10,055	15,006	6,421
	CBU-3	-	-	4	10
	CBU-12	-	650	1,614	499
	CBU-14	82	10,015	19,680	10,279
	CBU-19	-	-	264	689
	CBU-22	-	-	1,368	311
	CBU-24	-	118	6,173	7,705
	CBU-25	-	-	743	2,711
	CBU-28 (DRAGONTOOTH)	-	-	-	-
	CBU-29	-	-	101	623
	CBU-34 (WAAPM)	-	-	-	-
	CBU-39 (XM-49 GRAVEL)	-	-	277	-
	CBU-40 (BUTTON)	-	-	-	-
	MLU-10B/BLU-31	-	270	20	-
	MIA 2 FRAG	20,997	7,664	13,111	9,638
	M28A2 FRAG	52	799	3,327	1,303
	M88/M81 FRAG	26,776	63,327	10,942	-
Rocket Motors	2.75" Rocket Motor	79,294	551,753	811,230	635,074
Missiles	AIM-4A/D	-	-	-	97 [1]
	SPARROW, AIM-7D/E	10	90	496	333 [1]
	SIDEWINDER, AIM-9B	69	83	317	97 [1]
	BULLPUP, AGM-12B	196	95	4	-
	BULLPUP, AGM-12C	-	219	435	293
	SHRIKE, AGM-45A	-	76	870	821
	AGM-78A	-	-	-	-

[1] Includes following missiles expended at Clark in support of combat SAGE: AIM-4A/D - 43; AIM-7D/E - 118; and AIM-9B - 3.

[redacted]

Source: PACOM Munition Status Report, 31 Dec 67

conserve assets for use against hardened targets. Production of the MK-84 2,000-pound low drag bomb was considered adequate; however, there were indications in late 1967 that PACAF's heavy munitions needs might increase substantially in 1968.* [17]

JCS Reserve

(S [redacted]) On 24 January 1967, in accordance with a directive from Secretary McNamara, the JCS directed that a "JCS Reserve" be established. According to OSD's initial guidance, the rationale for the reserve lay in the fact that, with greatly increased production, more conventional air munitions were being sent to Southeast Asia on the "push" automatic resupply system than were needed.+ This was corroborated by Adm. U. S. Grant Sharp, Commander-in-Chief, Pacific (CINCPAC) who had in fact requested that most munitions be withdrawn from the resupply network and placed on a system of specific requisitioning.[18]

([redacted]) Although he agreed with CINCPAC's view, Mr. McNamara wished to continue some kind of JCS control over the munitions deleted from automatic resupply. Obviously, a few items would remain in the direct resupply pipeline and SEA requisitions from CINCPAC components would be filled as submitted. However, other specified air munitions would be established in Continental United States (CONUS) depots (except those controlled by the Commander-in-Chief, Atlantic) as a JCS reserve. "Munitions from this reserve," declared the Defense Chief, " will only be released as approved by the Assistant Secretary of Defense (I&L) upon JCS request."[19] The reserve was to be stored and accounted for by each service in appropriate depots.[20]

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*In mid-1967, Secretary McNamara had approved production of the MK-84 as an interim munition pending production of the BLU-34.

+In fact, ordnance which was little used began to accumulate in the fall of 1966 with the result that storage and handling facilities became saturated with a concomitant backup of munitions ships, especially at Cam Ranh Bay. (Hist (S), Non-Nuclear Airmunitions Br, Munitions Div, Dir/Sys & Log, 1 Jan-30 Jun 67).

[redacted] The services were directed to submit a monthly report to the JCS, to include transactions and inventory, beginning as of 31 January. The first USAF report was submitted to the JCS on 27 February. All major air munitions employed, or planned for employment in SEA, were listed.[21] JCS Reserve tonnages for 1967 were:[22]

Month	End of Month Balance (Thousands of Tons)
January	40,064
February	45,451
March	57,330
April	69,134
May	79,188
June	85,949
July	75,394
August	66,231
September	78,092
October	71,089
November	72,458
December	68,147

[redacted] The decrease in more than 10,000 tons of reserve munitions between June and July reflected the increased use of the MK-81 250-pound and MK-82 500-pound general purpose bombs along with the M-36 750-pound incendiary bomb. Also, BLU-27 napalm bombs were withdrawn from the JCS Reserve to compensate for a production decline which had been directed when requirements decreased. The decrease from 78,092 in September to 71,089 in October was due to the amount of ordnance taken from the reserve to support the war readiness materiel rebuild in both the United States Air Forces in Europe (USAFE) and the Pacific Air Forces (PACAF). Munitions in USAFE's WRM totaled 9,640 tons with the M-117 accounting for 8,610 tons (21,000 bombs). The balance consisted of 280 CBU-12 dispensers (103 tons), 1,648,000 rounds of 20mm ammunition for the M-39 gun (470 tons), and 36,537 MK-24 flares (457 tons).[23]

Stockpiling vs. Production

(S-[redacted]) The munitions production program did not specifically take into consideration ordnance designed to build up war readiness materiel stocks. OSD continued to operate on the philosophy that when the war ended, the remaining ordnance--together with what remained to be produced on existing contracts--would provide the majority of the total WRM requirement. Also, with an in-being production base when hostilities ceased, OSD believed a program could be planned which would provide adequate production and which could expand to meet future emergencies. By closely matching production to actual consumption, the OSD concept minimized the chances of ending up with a potential surplus of obsolescent munitions.[24] Secretary Brown endorsed the policy as follows:[25]

> Maintaining an immediately responsive production base in lieu of stockpiling total requirements has several advantages. It provides flexibility to react quantitatively to changing operational requirements and an opportunity to take advantage of product improvements from continuing R&D and field experience. A ready production base also allows us to maintain reasonably stable programs from year to year, thus keeping private industry geared to a steady, long term production pace, and enabling it to retain a nucleus of skilled production personnel.

(S-[redacted]) Nevertheless, the Air Staff--concerned about the possibility of a contingency elsewhere--felt additional provisions should be made to insure a quick reaction in the event that a munitions requirement developed in an area where the WRM was clearly inadequate. For example, at the time of the Arab-Israeli war of June 1967 stocks of conventional munitions in Europe were at less than half of the 60 days supply authorized. Also, with the weight of the logistic effort directed toward Southeast Asia, the Air Force could have been in an

uncomfortable position if the United States had been forced to intervene.* OSD felt that in the event of a contingency in Europe or elsewhere munitions could be diverted from the SEA pipeline, the JCS Reserve or from the production base. Airlift would be used to meet emergencies. But Headquarters USAF believed that--given past expenditures and especially lead time--the programmed production level during 1968 would provide only a slight margin of safety. A significant increase in expenditures would definitely call for increased production. The Joint Chiefs were also concerned about being able to support fiscal 1968 and 1969 force deployments and expenditures. Because ammunition lead time averaged about six months, they felt that a change in procurement policy was indicated.[26]

(S-Gp-4) On 16 June 1967, after the Six Day War, Mr. McNamara authorized an increase in production to permit sending 40,800 tons of munitions to USAFE and 17,000 tons to PACAF as war readiness materiel. A monthly schedule was established which provided for the phased shipment of air munitions extending into calendar year 1968. The fiscal year 1968 DOD logistical guidance called for 60 days prestockage in USAFE and 90 days in PACAF. The total USAF peacetime global WRM requirement was 715,000 tons.[27]

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* During the Arab-Israeli war of June 1967, USAFE actually sent a request for munitions to Headquarters USAF. However, since munitions were not readily available for shipment, USAFE was directed to support any possible action from its own resources. At the same time, the Air Force Logistics Command (AFLC) was directed to make preparations for a 20-day support shipment to Europe and certain munitions in excess of SEA and training requirements were diverted to an eastern depot as part of the JCS Reserve. [Hist (S), Non-Nuclear Munitions Br, Munitions Div, Dir/Sys & Log, 1 Jan-30 Jun 67, p 166]

(S [redacted]) With more conventional munitions flowing from production, however, it was possible to rebuild WRM stocks in both Europe and the Pacific consonant with DOD prestockage policy. A total of 74,265 M-117 bombs were allocated for the war readiness materiel buildup. MK-81 and MK-82 bombs, 20-mm ammunition and other munitions were also marked for USAFE and PACAF distribution.[28]

Phaseout of "Special Express"

(S-Gp-4 NOFORN) By February 1967 the "Special Express" munitions pipeline system--which was inaugurated in 1965--was phased out. This system of ordnance-carrying ships under charter to the Air Force had been established coincident with the rapid SEA buildup in 1965. A number of them also served as floating warehouses, augmenting the limited storage and port handling facilities in the theater. Since, by late 1966 and early 1967, storage and handling facilities were able to accommodate the munitions flow, the Special Express network was discontinued. During its operations, Special Express had moved almost three-quarters of a million tons of air munitions to Southeast Asia.[29]

(S [redacted]) Beginning in December 1966, the Air Force began the so-called single/dual port discharge system under which ships were commissioned specifically to carry USAF munitions directly from CONUS ports to Southeast Asia. Off-loading was done at one or two SEA ports, after which the munitions were shipped to a network of USAF bases inland. This system proved to be more efficient and economical for the Air Force during 1967.[30]

III. SOUTHEAST ASIA BASE CONSTRUCTION

(S) The Air Force made substantial construction progress in Southeast Asia during 1967. The foremost achievements included completion of the entire airfield complex at Tuy Hoa, Republic of Vietnam (RVN), in June and the opening in May of the USAF air base at Phu Cat, Vietnam. The latter provided minimum essential operational facilities for a squadron of F-100's, which arrived from Bien Hoa on 29 May 1967. A second F-100 squadron deployed to Phu Cat from Phan Rang in June. Construction of the four new USAF jet-capable bases in South Vietnam, which began in 1965, was thereby completed when Tuy Hoa and Phu Cat joined Cam Ranh Bay and Phan Rang as operational bases.[1]

(S) The Air Force also made noteworthy progress in Thailand where facilities were completed to support B-52 operations at U-Tapao AB, which became operational in late 1966. Also in Thailand, additional vital construction was begun at Nakhon Phanom, Ubon, and Korat AB's to support the anti-infiltration surveillance system.* Too, the Air Force programmed $9.8 million to move all Thai Air Force flying training programs from Korat to Kamphaeng Saen AB in order to provide more space for USAF units at Korat.

(S) By mid-1967 projects under way or completed accounted for more than 80 percent of the $690 million appropriated through the fiscal year 1968 military construction program (MCP).+ These projects included replacing existing AM-2 aluminum matting with pavement, improving troop housing and

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*See Chapter IV.

+Of the $690 million, approximately $400 million went to South Vietnam and about $225 million to Thailand. The remainder was devoted to other USAF bases in Taiwan, the Philippines, Japan, and Okinawa.

base support facilities, and construction of various facilities at Kadena, Okinawa ($30 million), Ching Chuan Kang, Taiwan ($2.8 million), and Clark AB, Philippines ($19 million). Almost all of the work was finished by the close of 1967.[2]

(U) The Southeast Asia construction program was facilitated by the use of USAF heavy repair squadrons (Red Horse), which played an increasingly useful role in 1967. Six 400-man Red Horse squadrons had been moved to the following SEA bases prior to 1967 (in order of deployment): Phan Rang, 554th; Cam Ranh Bay, 555th; U-Tapao, 556th; Phu Cat, 819th; Tuy Hoa, 820th; and Bien Hoa, 823rd. As required, elements of these units--which were proficient in construction, repair, and maintenance--were sent to other bases. During 1967 detachments of Red Horse personnel worked on projects at Da Nang, Nha Trang, Korat, Ubon, and other sites.[3] According to Secretary Brown, the heavy repair squadrons had proved to be of great value and were required "as a permanent part of the Air Force tactical force."[4]

(U) The Air Force also found that its Prime Beef (Base Engineering Emergency Force) teams made a substantial contribution in the theater. Between August 1965 and December 1967, 61 Prime Beef contingency teams ("C" teams)* were deployed overseas for 120 days of temporary duty (TDY), 59 of these to Southeast Asia.+ During 1967 Prime Beef units worked at Phu Cat, Tuy Hoa, Tan Son Nhut, Nha Trang, U-Tapao, Bien Hoa, Da Nang, Korat, Takhli, Pleiku, and other bases. They installed water supply, fuel,

*As opposed to Prime Beef "F" teams deployed for CONUS support.

+The two others went to Alaska and Antarctica.

26 Jan 68

AIRFIELD FACILITIES

AS OF 31 DEC 67

AIRFIELD	RUNWAY		PARKING AREA (Sq Yds)	AIRCRAFT REVETMENTS	AMMO STORAGE Capacity (Tons)
	LENGTH (Ft)	TYPE			
South Vietnam					
Bien Hoa	10,000	Concrete	270,222	92	4,750
Binh Thuy	5,600	Asphalt	32,000	66	-
Cam Ranh Bay	10,000 10,000	AM-2 Concrete	502,799	46	11,000*
Da Nang	10,000 10,000	Asphalt Concrete	306,297	83	9,425
Nha Trang	6,200	Asphalt	283,168	17	-
Phan Rang	10,000 10,000	AM-2 Concrete	333,645	134	6,500
Phu Cat	10,000	Concrete	207,860	71	4,750
Pleiku	6,000	Asphalt	109,990	38	2,000
Tan Son Nhut	10,000 10,000	Concrete Concrete	322,873	67	1,050
Tuy Hoa	9,000 9,000	AM-2 Concrete	209,000	73	5,500
Thailand					
Korat	9,800	Concrete	287,870	42	11,158
Nakhon Phanom	7,000	AM-2	104,788	-	2,900
Takhli	9,800	Concrete	268,000	-	6,958
Ubon	9,000	Concrete	143,440	5	7,403
Udorn	10,000	Concrete	192,478	5	3,470
U-Tapao	11,500	Concrete	565,250	-	15,150

*Includes Tri-service area of 8,000 tons

[redacted]

Source: 7th AF Command Status, Dec 67.
PACAF Airmunitions Planning and Programming Guide, Dec 67

and sewer systems and constructed mess facilities. They also built hangars and revetments and carried out additional general construction. Through December 1967 approximately 1,800 Prime Beef personnel had moved to Southeast Asia.[5]

(U) At the close of 1967 it was evident to Headquarters USAF that there would be a continuous need for Red Horse and Prime Beef units. Since the war showed no sign of ending, the heavy repair squadrons would be required in the future for major repair and maintenance tasks including the rebuilding of runways which assumed paramount importance in any prolonged and indeterminate deployment.

(U) Although the magnitude of USAF construction in Vietnam and Thailand decreased during 1967, an important change occurred in the so-called "approval procedures." On 31 January 1967 Secretary McNamara revised the procedures for South Vietnam and thereby eliminated functional facility categories which had been used since February 1966. Under facility categories, the Military Assistance Command, Vietnam (MACV) was able to transfer program authorization from one category to another without Washington's approval, provided the cost increase was no more than 10 percent. The new procedures provided that authorizations could still be transferred, but only if approval was requested from OSD. If any action was not disapproved within 21 days, then MACV could assume that OSD approval had been granted. Such authorization changes had to be formally justified by MACV unless the changes were less than 10 percent of the project cost or $50,000, whichever was larger. On 6 April 1967, effective with the fiscal year 1967 supplemental program, Deputy Secretary of Defense Cyrus Vance approved the new procedures for construction in Thailand.[6]

(S [redacted]) With the greater part of the SEA base complex completed, Headquarters USAF planned to limit future construction activity to rebuilding runways and to general repair and maintenance work. However, for a time it appeared major new construction tasks would be required. This situation arose out of a proposal by Mr. Ellsworth Bunker, the U.S. Ambassador to South Vietnam, who recommended to Gen. William C. Westmoreland, the MACV commander, that as many American personnel as possible be moved out of the Saigon area in order to reduce city congestion and piaster expenditures. The Bunker plan required the deployment of three airlift squadrons from Tan Son Nhut to Bien Hoa. The Air Force opposed the so-called Move Out of Saigon Earliest (MOOSE) program--and its position was endorsed by both MACV and OSD--on the grounds that it was neither cost effective nor operationally desirable to shuffle several thousand people and their equipment from Tan Son Nhut to Bien Hoa. The project was deleted from the USAF fiscal year 1969 budget request and was not recommended by the JCS.[7]

(S [redacted]) A comparison of CINCPAC and JCS-recommended programs for the fiscal year 1969 military construction program follows (in millions):[8]

	CINCPAC		JCS	
	Vietnam	Thailand	Vietnam	Thailand
Army	$189.1	$42.5	$189.1	$38.6
Navy	159.6	7.7	159.0	7.9
Air Force	88.7	47.7	20.6	13.3

As far as the Air Force was concerned, the major difference between the two programs involved the desirability of extensive airfield matting replacement in Thailand and Vietnam and the MOOSE project in Vietnam.[9]

Project Turnkey

(U) In mid-November 1966 the new expeditionary AM-2 mat airfield was completed at Tuy Hoa under the turnkey concept. The 308th Tactical Fighter Squadron (F-100) arrived in November and on 16 December was joined by the 306th and 309th. Meanwhile, work began in December 1966 on the Portland Cement Concrete (PCC) parallel runways and continued into early 1967 along with construction of allied operational and support facilities.[10]

(U) Under a cost plus fixed fee contract with incentive provisions for early completion of facilities, the contractor completed the concrete runways on 28 April 1967 and all facilities on 10 June, two weeks ahead of schedule. On 12 June the major portion of the contractor work force was demobilized and by 10 July all on-site construction was closed out. Contractor equipment and remaining materiel were transferred to the Air Force on a reimbursable basis. The estimated value of this equipment--to be used by Red Horse squadrons--was $8,700,000. By meeting the incentive schedule, the contractor earned the full incentive bonus of $900,000.* [11] The total contract cost was as follows:[12]

Final Contract Amount

	Cost	Fee	Total
Construction	$48,089,386.58	$3,115,000.00	$51,304,386.58 (Net costs)
Engineering	1,623,758.00	55,000.00	1,678,785.00
Non-Construction	3,794,672.42	20,600.00	3,815,272.00
TOTAL	$53,507,844.00	$3,190,600.00	$56,798,443.58

*The $900,000 included $400,000 for early completion of the expeditionary airfield, $360,000 for finishing the runways ahead of schedule, and $140,000 for meeting the demobilization schedule. /Dir/Civ Engr Talking Paper, 26 Jul 67, subj: Turnkey Construction Costs, Tuy Hoa AB, Vietnam/

(U) Thus, at a net construction cost under the programmed $52 million, the USAF turnkey project produced the most complete new tactical air base in Vietnam ahead of schedule. Although Headquarters USAF planned no similar projects in the immediate future, it was clear that the turnkey approach had important advantages.[13] Secretary Brown observed in testimony on Capitol Hill that "in cases where a contractor can be used rather than engineering construction troops, the Turnkey concept developed by the Air Force appears to offer a good means of providing new construction." However, he emphasized that the Air Force did not "wish to become a manager of large construction projects."[14] He added that the concept was especially adaptable to construction in remote areas where the probability of enemy attack was small and suggested that it might well be useful to other agencies.[15]

U-Tapao (Sattahip)

([redacted]) In late 1966 and early 1967 the Air Force was authorized to base 25 B-52 heavy bombers in Thailand at U-Tapao AB. It had been obvious for some time that B-52 strikes launched solely from Andersen AFB, Guam, were exceedingly expensive and that the big bombers should be moved closer to the theater of operations. By basing them in Thailand, for example, reaction time and costs could be reduced measurably and operations facilitated.

([redacted]) In August 1966 Headquarters USAF and the JCS began considering various bases for possible B-52 deployments. The Air Staff on 31 August compiled a list of facilities which would be needed to support 30 B-52's at a main operating base (MOB) at a cost of $24.7 million. This list was sent to OSD, JCS, and CINCPAC. In late September SAC offered a revised list of facilities whose cost totaled $29.274 million. Another Air Staff study in

October weighed the basing of B-52's on an austere forward operating base (FOB) in South Vietnam. Some thought was given to Kadena AB, Okinawa, but this was ruled out by the State Department. The Philippines also was under consideration by OSD.[16]

(S [redacted]) By November Headquarters USAF had established a study group to evolve a specific plan for locating the B-52's at U-Tapao. (A SAC survey team subsequently visited that base.) This plan indicated that savings of $7 million per month could be realized by basing 15 B-52's at U-Tapao on an MOB basis. With 35 bombers on Guam, the total of 50 aircraft could fly 800 sorties each month. It would take 70 B-52's stationed at Guam to fly the same number of sorties. The plan was finished on 30 November and submitted to Mr. McNamara.[17]

(S [redacted]) On 17 December 1966 the Defense Chief approved $19 million in the fiscal year 1967 supplemental military construction program for basing 15 B-52's at U-Tapao under the MOB concept. However, since the civilian contractor at U-Tapao was in the process of phasing down construction activity, it became necessary to act quickly and add the new requirement to the existing contract. Whereupon, the Office of the Secretary of the Air Force (OSAF)--noting that funds in the fiscal year 1967 supplemental would not be available in time to prevent the contractor from demobilizing in January 1967--requested Mr. McNamara to provide $7.5 million from the OSD contingency fund for this program. If the money were released immediately, the contractor could continue earthwork and paving at U-Tapao without any interruption.[18]

(S [redacted]) However, the entire $200 million contingency fund had already been allocated to other high-priority projects. Deputy Secretary of Defense Vance consequently suggested that the funds be taken from the $97.1 million

available in the USAF Thailand construction fund, and temporarily defer other approved work. Money for postponed projects would be restored when Congress appropriated funds for the B-52 program.[19]

([redacted]) Meanwhile, Headquarters USAF, in consultation with SAC and PACAF, established construction priorities based on funding of $19 million. In mid-January 1967 design was authorized for 38 separate items including pavements, POL facilities, etc. On 2 March 1967, Mr. Vance approved B-52 "Arc Light" construction at U-Tapao* and on the same day Prime Minister Thanom of Thailand agreed to the use of the base by B-52 aircraft and authorized his Deputy Defense Minister to approve U.S. proposals for additional construction.[20]

([redacted]) Secretary McNamara on 4 March directed that the work begin immediately in order to complete the facilities before the onset of the monsoon season. Four days later the Air Force's 556th Civil Engineering (Heavy Repair) Squadron began building an interim ammunition facility and access road and on 14 March the contractor was directed to proceed with construction.[21]

([redacted]) USAF planning called for deploying three B-52's to the base on 10 April 1967 followed by three more on 1 May, four aircraft on 22 May, and the remainder on 30 June. On 31 March Mr. Vance directed the actual deployment of the 15 B-52's from Guam to U-Tapao. Thus, the base became the first Southeast Asia mainland facility to accept the bombers when, on 10 April, the first three B-52's arrived from Andersen AFB. The very next day they flew their first combat mission from Thailand, striking enemy targets near Da Nang.

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*Including ammunition storage, taxiway, hardstands, shoulder stabilization, and refueling hydrants--at a cost of $9.2 million.

Three more deployed on 1 May with four additional heavy bombers being in place on 22 May, including one ground spare aircraft. Five others arrived at U-Tapao on 30 June 1967.[22]

([redacted]) As B-52 operations from U-Tapao became routine, Headquarters USAF during the late summer studied the possibility of increasing the number of Thailand-based heavy bombers from 15 to 25 with an attendant increase in their SEA sorties from 800 to 1,200 per month. On the basis of this study, it proposed deploying an increment of seven additional B-52's to U-Tapao, bringing the total to 22 aircraft. After the base achieved an MOB status in February 1968, the total would be brought to 25 B-52's.[23]

([redacted]) The Joint Chiefs approved this recommendation on 14 October and submitted it to Mr. McNamara, who also endorsed it and requested the Air Force to prepare a specific plan for supporting the greater sortie rate. Completed by the Air Force in early December, this plan was forwarded to the Defense Chief with a request for $9,956,000 in contingency funds to support the increased B-52 sortie rate.[24]

Director of Construction for Thailand

([redacted]) As was noted in an earlier narrative, in January 1966 Deputy Secretary of Defense Vance approved establishment of the Office of the MACV Director of Construction.* OSD's rationale for establishing a "construction boss" for Vietnam was that centralized direction was required in a situation where a number of services and agencies were competing for resources and

*See Herman S. Wolk, USAF Logistic Plans and Policies in Southeast Asia 1965 (AFCHO, June 1967), pp 34-35.

requirements. Several months later, in April 1966, Secretary McNamara suggested to Gen. Earle G. Wheeler, Chairman, JCS, that a Director of Construction for Thailand also might be needed. On 8 June 1966, however, the JCS recommended that this position not be established since adequate authority to coordinate and execute the construction program in that country had been delegated by CINCPAC to COMUSMACTHAI.* Secretary McNamara replied that he "reluctantly agreed" with the JCS view--at least for the present.[25]

(S [redacted]) Some nine months later, following a review of SEA military construction by a Department of Defense (DOD) study group which recommended a Director of Construction for Thailand, Mr. Vance on 18 April 1967 asked General Wheeler to take another look at the proposal. In late April and early May, Admiral Sharp made it clear that he favored the existing arrangement. Centralization was not necessary in Thailand, Admiral Sharp said, because construction programming and control were a service responsibility. Also, he argued that there remained no serious competition for construction materials in Thailand--unlike the case in South Vietnam. In fact, the size of the Thai construction program was smaller than that originally envisioned.[26]

(S [redacted]) On the basis of CINCPAC's view--and in contradiction to the report of the DOD study group--the JCS concluded that a Director of Construction for Thailand was not required. The key point, said General Wheeler in a memorandum to OSD, was that MACTHAI did not exercise operational control of all in-country forces. While he coordinated construction in Thailand, the MACTHAI commander--if unable to obtain coordination by the component units--referred the problem to CINCPAC. Establishment of a MACTHAI

*COMUSMACTHAI--Commander, U.S. Military Assistance Command, Thailand.

Director of Construction would, he believed, require a change in existing command relationships which was neither required nor desirable. On the other hand, the JCS recommended an enlarged engineering staff for MACTHAI along with improved coordination for Thailand construction.[27]

(S [redacted]) Headquarters USAF fully supported the view of the Joint Chiefs that construction management was of a different character in Thailand than Vietnam. Maj. Gen. R.H. Curtin, USAF Director of Civil Engineering, observed that "conditions which require a Director of Construction in Vietnam do not exist in Thailand." Further, said General Curtin, construction was being satisfactorily managed in Thailand with CINCPAC providing adequate direction for the program.* [28] The Navy and Marine Corps also endorsed the JCS position.

(S [redacted]) The Army, however, non-concurred and argued for establishing a directorate of construction in Thailand. While recognizing that Thailand construction was being adequately managed, Army officials felt that a Director was needed in order to coordinate planning of "crash" projects and in support of contingency plans. They expressed concern lest the experience in Vietnam be repeated in Thailand with "piecemeal planning and construction..." Specifically, the Army cited as an example the USAF requirement for construction at U-Tapao which was submitted "without timely consideration of Army construction support requirements."[29]

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*Mr. Lewis E. Turner, Deputy Assistant Secretary of the Air Force (Installations) disagreed with the Air Staff view and argued that a Director of Construction for Thailand was needed "to assure proper management and integration of the total DOD program." In general, Mr. Turner felt that, although the Thai situation was in fact different from Vietnam, "so long as there are construction programs for more than one service in the country, someone of sufficient stature and authority should determine the priority in which the work is to be accomplished..." √Memo, Lewis E. Turner, Dep Asst SAF (Installations) to Dir/Civ Engr, 6 Jun 67, subj: Director of Construction for Thailand_/

[redacted]

2 Feb 68

SOUTHEAST ASIA MAJOR BASE SUMMARY

VIETNAM

BASE	AF PERSONNEL STRENGTH*	AF AIRCRAFT ON BASE **	COMMANDER	MAJOR UNIT	MAJOR TYPE AIRCRAFT
Bien Hoa	5,894	185	Col McLaughlin Col Fogle	3 TFW 504 TacAirSptGp	F-100 O-2A/O-1
Binh Thuy	1,455	59	Col Carlisle	632 CSG	
Cam Ranh Bay	8,026	130	Col Davis Col Mason	12 TFW 483 TAW	F-4C C-7
Da Nang	6,935	164	Col Watson	366 TFW	F-4C/D
Nha Trang	3,980	117	Col Patton	14 ACW	AC-47
Phan Rang	5,123	124	Col Wilson Col Brown	35 TFW 315 ACW	F-100 C-123
Pleiku	2,508	40	Col Hullar	633 CSG	EC-47
Phu Cat	3,227	69	Col Schneider	37 TFW	F-100
Tan Son Nhut	12,253	118	Gen Momyer BG McLaughlin Col Holbury	7th AF 834 AD 460 TRW	 RF-4/EC-47
Tuy Hoa	4,098	76	Col Evans	31 TFW	F-100

THAILAND

Bangkok	385	11	Col Johnson	631 CSG	
Korat	6,467	83	Col Graham Col Weiser	388 TFW 553 RW	F-105 EC-121
Nakhon Phanom	3,466	116	Col McCaskrie	56 ACW	U-10/T-28/ A-26/A-1E
Takhli	4,880	88	Col Giraudo	355 TFW	F-105/EB-66
Ubon	4,134	85	Col Spencer	8 TFW	F-4D
Udorn	6,147	97	Maj Gen Lindley Col Cabas	D/Cdr 7AF/13AF 432 TRW	 RF-4
U-Tapao	6,092	51	Col Talmant	4258 STRAT WG (SAC)	KC-135

* As of 30 Nov 67.
** As of 28 Jan 68.

[redacted]

([redacted] Despite the above position, the majority view carried and the JCS rationale was upheld on 29 June 1967 by Deputy Secretary Vance. Noting that the Joint Chiefs had recommended against forming a directorate of construction in Thailand, Mr. Vance approved the JCS recommendation to enlarge MACTHAI's engineering staff, etc., "on a trial basis," directing that at the end of six months the situation be reviewed again.[30]

The Raymond Construction Report

([redacted] The year 1967 saw tangible progress not only in providing SEA operational facilities but also a high level critical evaluation of the construction program in Vietnam and Thailand. A landmark report by Brig. Gen. Daniel A. Raymond, the Director of MACV Construction, dated 1 June 1967, was submitted to OSD upon his relinquishment of that post.* General Raymond's report was closely studied by Secretary McNamara and led to an OSD directive on 26 July which requested the JCS and all military departments to "extensively analyze" military construction in South Vietnam in order to improve the program.[31]

([redacted] Underlying General Raymond's observations and recommendations was the fact that construction in Vietnam began under circumstances which demanded rapidity of action more than anything else. At first--and until 1967--requirements were vaguely defined and estimates (including cost) were often inaccurate. It was not until late 1966 that the essential character of the overall construction task became clear. Not only did it involve three individual service programs, but each of these was of a different character, being organized and conceived to accomplish disparate objectives. The service programs were coordinated as a theater program by COMUSMACV.[32]

*Upon leaving his post at MACV, General Raymond became the SEA Construction Division chief in the Office of the Assistant Secretary of Defense for Installations and Logistics.

(S) Overall construction was accomplished by a combination of civilian contractor and troop construction units with the bulk of the work being done by the former* under the cognizance of the Officer-in-Charge of Construction (OICC), U.S. Navy. The Office of the Secretary of Defense assumed the pivotal role in overall construction management through reprogramming control, certification of requirements, and allocation of contingency funds.[33]

(S) In his report, General Raymond was critical of the Army and Navy, declaring that the "greatest single problem" in isolating construction requirements in Vietnam flowed from inadequate planning by these two services. (This inadequacy in turn significantly affected the USAF programs since the Air Force depended on the other two services for construction of its bases.) The Director of MACV Construction cited the "confusion and delay in developing requirements and in translating requirements into plans for execution." Paradoxically, the Army had the least planning ability, yet was faced with the greatest task in-country.+

(S) The Air Force, according to General Raymond, had done adequate planning prior to the buildup in 1965 and this was evident in its base construction program. The problem with the Army and Navy was that their planning was far too decentralized--at least at the outset. Too, the Army and Navy were primarily designed to operate in the field while the Air Force had become "a sophisticated industrial operation insofar as its ground activities are concerned." More importantly, General Raymond said, the services had only

*The so-called single joint venture of the RMK-BRJ combine--Raymond International, New York; Morrison-Knudsen, Boise, Idaho; Brown and Root, Houston, Tex.; and J.A. Jones, Charlotte, N.C.

+On this point, see Wolk, USAF Logistic Plans and Policies in Southeast Asia 1965 (AFCHO, June 1967)

partial control of their programs since these were recommended by components and then reviewed through joint and service echelons with a final, decisive review by OSD. Thus, this complexity "made processing of programs slow and tedious. Clearly some arrangements should be made to simplify and streamline existing procedures. What was bought in Vietnam was not construction in the normal sense but a capability to construct facilities." [34]

(C) The need to establish the RMK-BRJ joint venture was recognized since the Administration in 1965 decided not to mobilize the Army reserve which included a significant number of construction units.* As far as the contractor performance on the USAF turnkey project was concerned, General Raymond concluded that it was successful, although he felt that both the construction time and cost were comparable to similar projects. "Considerable external Air Force support," he said, also was provided the turnkey project which "did not appear as a military construction cost." He further concluded that, while turnkey was highly effective as a "one shot requirement," it should not be held out as a model for "multiple requirements" primarily because of cost and complexity of operational controls. In his report, General Raymond also commented on USAF Red Horse and Prime Beef civil engineering units, which he said exhibited considerable skill and had performed well in Southeast Asia.[35]

(C) In early September, in response to Mr. McNamara's call for an extensive analysis of the Raymond report, Admiral Sharp advised the JCS that he supported General Raymond's observation that SEA construction was far too

*During 1965 and 1966 the JCS repeatedly recommended reserve mobilization.

inefficient and he also thought there should be more detailed planning as a means to avoid future "crash" efforts. He said that reprogramming, which in the context of Southeast Asia had occurred often, was far too complex and voluminous in reportage. At the heart of this unresponsiveness and ineffective management lay the system of peacetime programming which had not been adequately adjusted to a wartime situation.[36]

(S) Admiral Sharp's criticism was supported by the Joint Staff, which revised its initial draft report after USAF officials objected to the call for providing "sweeping authority" over military construction to the unified command. In general, Headquarters USAF felt that the first report "went too far too fast." The final paper adopted by the JCS, which included Navy and Marine Corps inputs, emphasized the need for base development planning at all levels of command and greater flexibility in funding and mobilization to cope with fast-breaking contingencies.[37]

(S) In general, the Joint Chiefs observed that funding had lagged behind the requirement for facilities and that justification procedures had been too complicated. On the other hand, the U.S. construction effort had made itself felt because of the unique character of the war in Vietnam (that is, a large civilian combine could be mobilized without undue interference from the enemy); this would not always be the case in the future and planning should not be predicated on a repeat situation.[38]

Cost Overruns

(S) The problem of spiraling costs was not new to the construction program in 1967. Cost increases over original estimates had risen steadily since 1965 and by mid-1966 the figure stood at $200 million, about one-fourth

of the overall program. General Raymond thought that this particularly large overrun resulted primarily from over-mobilization early in the program, when too much money was committed to investment costs and too little saved for operating the actual mobilized capability.[39]

([redacted]) In January 1967, six months after the first large overrun came to light, another imbalance of the same order of magnitude as the first was identified. According to General Raymond, among the reasons for the second overrun was that construction planners still lacked experience and the ability to predict the cost of facilities and not enough stress had been placed on contract cost control.[40]

([redacted]) A report by a CINCPAC study group on cost overruns corroborated General Raymond's observations and pointed to the inadequacy of using basic peacetime administrative controls in Vietnam. The peacetime "line item" system* of funding proved invalid and, coupled with tremendously rising costs of material and labor, contributed to the problem. The CINCPAC group concluded that, under these conditions, the "large unexpected program overruns were inevitable."[41]

([redacted]) General Raymond and the CINCPAC group also inferred what Col. Archie S. Mayes, Director of Civil Engineering, Seventh Air Force, stated explicitly when he noted that the RMK-BRJ combine was simply too large and unwieldy to operate effectively in the South Vietnamese environment. He thought greater decentralization was required and that there should be a single contractor rather than a large joint venture. He said that in 1966, for

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*A system under which contractor charges were first distributed among various line items, resulting in a time-consuming accounting process which negated effective and timely fiscal control.

example, RMK-BRJ's work-in-place rose from $25 million per month in May to $40 million per month in October. By the latter date the construction combine had hired more than 51,000 personnel. In defense of the joint venture, however, Colonel Mayes pointed out that when the buildup began in 1965, the stress was on building facilities as rapidly as possible without giving too much thought to the cost or management. It could not be denied, in the final analysis, that RMK-BRJ got the job done.[42]

Contractor Phaseout and the Level of Effort Concept of Construction Management

(Sanitized) By January 1967 the construction management system was becoming unraveled with soaring costs attributed to excessive purchasing of materiel and equipment and a poorly defined program. The USAF program was underfunded by $74 million at this time and the OICC realized that changes would have to be made in the basic management system. Since by late 1966 it had become apparent that the contractor would have to substantially reduce his work force, MACV prepared a plan for contractor phasedown which called for troop units to take over a significant share of any future construction. This MACV document, prepared in coordination with the OICC, set 1 April 1968 as the contractor phaseout date.[43]

(Sanitized) Titled the "Level of Effort Concept of Construction Management," the MACV plan required an accelerated phaseout of the contractor even earlier than authorized by Mr. McNamara since funds were not available to keep him going for a longer period. The major goal was to reduce costs by holding down monthly contractor expenditures to a pre-planned amount, while troop

construction units were brought in as substitutes. The following chart depicts the planned reduction in contractor costs compared with the projected increase in troop construction activity.[44]

Capability Projection Work-in-Place ($Millions)

	Contractor	Troop
July 1967	30	12.2
August	25	12.2
September	25	12.2
October	20	12.5
November	20	12.5
December	15	12.5
January 1968	15	12.5
February	15	12.9
March	10	12.9
April	5	12.9

([redacted]) Under this plan the so-called "full funding" concept would be applied to construction in South Vietnam. It provided for the use of two or more construction agents to complete projects without a predetermined time limit. Thus, the contractor could work on many more projects without being required to complete them. Projects not finished by the contractor would be completed by engineer troop units such as the Red Horse civil engineering (heavy) repair squadrons.[45] The specific MACV-OICC phaseout plan developed under the "Level of Effort" concept projected the following contractor work force:[46]

Contractor Work Force (Projected)

Month	U.S.	Third Country Natls	RVN	Total
April 1967	3,050	4,600	27,200	34,850
May	2,550	3,850	22,875	29,275
June	2,010	3,040	18,204	23,254
July	1,490	2,260	13,706	17,456
August	1,148	1,792	12,060	15,000
September	1,148	1,792	12,060	15,000
October	1,148	1,792	12,060	15,000
November	970	1,480	9,208	11,658
December	970	1,480	9,208	11,658
January 1968	970	1,480	9,208	11,658
February	970	1,480	9,208	11,658

[redacted] Unfortunately, following the adoption and implementation of the above plan on 1 April 1967, Admiral Sharp requested the deployment of still more forces to Southeast Asia, which meant that more facilities would have to be built than had been contemplated when contractor demobilization was set. Also, by May 1967 it became clear that the required troop construction units would not be available in time to supplant the contractor.* Consequently, following a 27 April meeting with General Westmoreland, the Joint Chiefs recommended to CINCPAC that the rate of contractor phasedown be reexamined. The Army, Navy, and Air Force supported the review since each service would be adversely affected if the civilian combine was phased out rapidly without an attendant increase in troop units.[47]

[redacted] The DOD study group which had earlier reported on SEA construction also suggested that a substantial contractor capability be retained at least until 1 July 1968. It said it felt strongly that:[48]

> The more use that can be made of the contractor while he is available, the greater will be the recovery of "spent" military construction funds...Requirements for essential facilities would justify this action; equally important is a necessity for a base for a substantial increase in construction if the war effort should require it.

[redacted] By the end of April 1968, at which time the contractor would be phased out, approximately $100 million in Air Force construction projects would remain to be completed. Consequently, Headquarters USAF urged retention of the contractor after April 1968. The Seventh Air Force, which also strongly supported this position, proposed that the contractor be kept on at least until June 1968 and ideally until October.[49]

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* CINCPAC had requested deployment of two more USAF Red Horse squadrons by 1 November 1967 and 1 February 1968.

([redacted]) On 29 July, after consulting with General Westmoreland, Admiral Sharp informed the JCS that the MACV construction plan had been revised to include a phasedown in RMK-BRJ personnel to approximately 15,000 by 1 October 1967 with this level maintained indefinitely until the war situation dictated a change one way or the other. This revised plan provided that RMK-BRJ operations after 1 October 1967 would be concentrated in three primary enclave areas in South Vietnam. CINCPAC also noted that the plan had already been "tentatively implemented" in that General Westmoreland had directed the OICC to hold the civilian work force at 15,000. Too, MACV still had the authority to shift funds from one project to another. In addition, the "full funding" concept meant that troop labor could completely take over from the contractor on projects started by the latter.[50]

([redacted]) The 15,000 RMK-BRJ force level was predicated on Program #4 requirements (that is, 471,000 troops in Vietnam by mid-1967) along with $90 million in fiscal year 1968 funds to sustain the work until 1 October 1968 when fiscal year 1969 resources were expected to be available. The Air Staff fully supported the revised plan and in late August the JCS recommended to Secretary McNamara that the required funds be provided to implement it.* [51]

Preparing for Contingencies

([redacted]) The Southeast Asian experience provided USAF logistic and construction planners a signal opportunity to study and analyze what could be done in future war situations to accelerate site selection and construction. In

*The JCS had originally proposed sending the revised plan to OSD without comment, but following a USAF suggestion, the paper was revised to include a strong statement of support and a recommendation for early funding. The other services supported the change. (Background Paper, Dir/Plans to CSAF, 25 Aug 67, subj: JCS 2472/138.)

this connection, it is pertinent to note that the Air Force concluded after the Korean War that advanced planning for air base construction during most of that conflict was inadequate. At that time USAF officials also suggested that new airfields should be built so as to include provisions for rapid expansion of facilities in the event of a changed operational situation.[52]

([redacted]) In retrospect, it seemed essential that potential base sites be identified early and in numbers sufficient to meet foreseeable operational needs. The important thing obviously was to avoid costly delays in site selection which in Vietnam had forced the Air Force to defer operational strike aircraft deployments in 1965 and 1966. Significantly, it was found that construction delays could be alleviated only by the timely deployment of USAF heavy repair squadrons, these units being introduced into the theater when it became apparent the Army and Navy would be unable to fulfill USAF requirements.

([redacted]) Another key conclusion was that the Air Force had to have adequate stockpiles of construction and base maintenance equipment and materiel to rapidly support combat operations. "Speed of reaction," as Secretary Brown noted, "can be decisive in the types of conflict we are most likely to see in the future."[53] The acquisition of foreign real estate was another important element in "crash" construction. Early discussions with potential host countries to obtain formal agreements might do much to expedite the acquisition of real estate to meet U.S. needs. Finally, the success of the turnkey project indicated that, where a contractor might be used in lieu of troop engineer units, such an approach could provide the needed facilities quickly with minimum impact on the host country's resources and economy.

IV. THE ANTI-INFILTRATION SYSTEM

([redacted]) By 1966 it had become quite clear that the Viet Cong insurgency in South Vietnam was being continually reinforced by a heavy flow of North Vietnamese troops and weapons through the demilitarized zone (DMZ) and Laos. The difficulties in interdicting this enemy traffic were considerable because of the jungle terrain with many hidden trails and the dearth of allied manpower to counter the infiltration.

([redacted]) As early as 1965, seeking a solution to this problem, Headquarters MACV and the Rand Corporation had studied the idea of building an anti-infiltration barrier across South Vietnam just below the DMZ. In February 1966 Secretary McNamara, who was highly interested in the concept, discussed it with Army officials who, at his request, quickly prepared a "talking paper" on the barrier concept. Briefly, they envisaged it would take five divisions six months to clear and secure a 216-mile, 500-yard-wide strip stretching from the South China Sea across Vietnam and Laos to Thailand. Twelve more months would be needed to fortify it with concertina wire, towers, searchlights, mines, and a fence.[1]

([redacted]) In March the JCS reviewed the concept and generally opposed it. The Air Force's view was that it connotated a "Maginot Line" or "Iron Curtain" type of strategy, which would require deployment of even more ground troops than were already committed to the war. The Joint Staff subsequently undertook a study which indicated it would take not five but six or seven divisions to clear and secure the selected terrain. The Joint Staff also predicted it would take two to four years to complete the barrier and require an enormous amount of materiel. General Wheeler--noting there was little or

no support for a project of this magnitude within the JCS or from commanders in the field--advised Mr. McNamara not to proceed with it. He observed that the additional resources could be employed more usefully to carry on the war in accordance with previous JCS recommendations.[2]

([redacted]) The Defense Chief, however, desired to pursue the matter and requested the Institute of Defense Analysis (IDA) to examine the problem and submit a report. In cooperation with specialists from universities, institutes, and corporations, IDA initiated an intensive investigation which was completed on 31 August 1966 and resulted in a conclusion that an air-supported, anti-infiltration barrier system was feasible. By using components already available, IDA thought an operable system was possible about one year after a decision was made to proceed. It estimated the annual cost at $800 million. IDA proposed to Mr. McNamara that he set up a task force to carry out more detailed planning and design of the barrier.[3]

([redacted]) The Secretary of Defense decided to go ahead with the project and, on 15 September 1966, he named Lt. Gen. Alfred D. Starbird, U.S. Army, to head JTF 728* to design an infiltration interdiction system for South Vietnam and Laos as a matter of highest priority. General Starbird began his activities by collecting data on the procurement of materials, improvement of certain SEA support facilities, and activation and equipping of special air units. He also initiated several priority research and development efforts aimed at acquiring specialized munitions and sensors to be "sowed" over the length of the barrier.[+4]

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*Its cover name was Defense Communications Planning Group (DCPG).

+The specialized munitions included "gravel" mines, anti-vehicle and anti-navigation mines, "dragontooth" munitions, and button bomblets.

Air Staff Concern

([redacted]) To assure Air Force support of the system, General McConnell appointed Maj. Gen. W. P. Swancutt, Director of Operations, as the Air Staff's focal point for all Air Force matters related to JTF 728. This responsibility was reassigned to Swancutt's Deputy, Maj. Gen. G. B. Simler. The Chief of Staff also requested the Director of Operations to establish within the Air Staff a "Combat Beaver" project to develop a concept for an aerial blockade against infiltration. General McConnell assigned the highest priority to this project.[5]

([redacted]) Meanwhile, after another review of the barrier concept, the JCS informed Secretary McNamara that they and Admiral Sharp still questioned its practicality, although the inadequacies might be resolved by a "vigorous determination of feasibility" prior to committing resources and taking other implementing action. They restated their view that there should be no diversion of combat logistic support from current military operations, and thought that the projected completion date was unrealistic. They wanted General Starbird's program definition plan, when completed, to be sent to the Defense Secretary through the JCS.[6]

([redacted]) In addition to the barrier's questionable feasibility, the Air Staff was concerned about the organizational aspects of the project. On 26 September 1966, Gen. Bruce K. Holloway, Air Force Vice Chief of Staff, informed Secretary Brown that the Air Staff believed JTF 728 should be headed by an Air Force general officer as the project was air-oriented. He further observed that the concept had serious drawbacks: it could indirectly jeopardize the existing high priority Southeast Asia program even if a directive were issued to prevent this, and might not be completely effective even if

done on a "Manhattan Project" basis.* He also thought it would create political problems with the South Vietnamese and Lao governments over the "sowing" of millions of nonsterilized mines which would remain after the war's end. General Holloway further noted that the jungle canopy would prevent distinguishing (in the fortified areas) between humans and animals and that the timetable for producing research and development items was too optimistic. But as Secretary McNamara had already directed General Starbird to proceed with JTF 728, the Air Force's Vice Chief of Staff promised the Air Force's full support of the project.[7]

([redacted]) In subsequent weeks, planning for the anti-infiltration system moved into high gear with Headquarters MACV, PACOM, PACAF, and other commands also deeply involved. On 15 November 1966 General Starbird forwarded to Mr. McNamara and the JCS a proposed program definition plan. After their review, the service chiefs unanimously agreed that the technical operational feasibility of the plan was still open to "serious question" and again recommended against its adoption on grounds of excessive cost, service inability to provide the necessary support forces on time, unrealistic research and development estimates, and the likely setbacks to current military programs and the war effort. They urged a continuation of Admiral Sharp's offensive strategy against infiltration.[8]

([redacted]) Meanwhile, the Air Staff completed and on 19 November sent its Combat Beaver anti-infiltration proposal to Admiral Sharp for his review. The PACOM commander rejected it, asserting that, with some exceptions, it

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*The Manhattan Project was the code name for the U.S. top priority effort that produced the atomic bomb in World War II.

was similar to the current air program, overstressed the importance of air strikes in "route packages" II, III, and IV (in southern North Vietnam), threatened to increase aircraft losses, and would disrupt the current "well-balanced" air effort. Still desirous of providing an acceptable concept, the Air Staff reworked and renamed it the integrated strike and interdiction plan (ISIP). Although never officially adopted, most of the plan's recommendations eventually were accepted by JCS and CINCPAC officials and put into effect.[9]

McNamara Orders Starbird to Proceed

([redacted] By December, scores of memos and directives were flowing between General Starbird's office and OSD, JCS, other Pentagon agencies and PACOM and MACV. On 7 and 22 December, at Secretary McNamara's request, General Starbird submitted more definitive plans. He proposed two anti-infiltration systems. One would consist of a linear barrier about 32 kilometers in length and fortified by wire, mines, sensors, early warning devices, and observation towers and backed by air strikes, artillery, ground strong points, and mobile reserve forces. The second, a defile barrier to be emplaced in Laos, would use sensor devices and be largely air-supported. More experiments were needed, however, to determine the design of the latter. General Starbird asked that the air supported system be developed as a matter of "highest priority."[10]

([redacted] Within the Air Staff the Tactical Division of the Directorate of Operations had already begun work, in November 1966, on a design and operational concept for a command and control facility to manage the air-

supported barrier. A design concept was published on 5 December and the Tactical Air Command (TAC) and the Air Force Systems Command (AFSC) were directed to develop an operations center mock-up to be used in checking out the system. The original mock-up, constructed at Eglin AFB and operated by the USAF Tactical Air Warfare Center (TAWC), involved a purely manual operation. Subsequently, a larger facility was constructed inside a hangar at Eglin, configured for both automated and manual operation, and training of personnel was begun.[11]

([redacted]) On 7 January 1967 the Joint Chiefs directed CINCPAC to prepare a plan for a ground strong point obstacle system in northeastern Quang Tri province and a second plan for an air-supported anti-infiltration network. The project subsequently was given the designation "Dye Marker."* On 9 January Mr. McNamara directed General Starbird to "undertake preparation of an anti-infiltration capability for SEA in accordance with the approach set forth in the DCPG plan."[12] The Defense Chief gave General Starbird authority to direct the separate military departments to take certain actions which would contribute to the overall system. At the same time, he instructed the Air Force to organize an EC-121 unit and the Navy to ready an SP-2E detachment.

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*The system had several names, including "Practice Nine," and "Illinois City." All referred to the overall project. In September 1967, in a further breakdown of designations, Dye Marker was identified as meaning the obstacle system, "Dump Truck" the air-supported, anti-personnel subsystem, and "Mud River" the air-supported, anti-vehicle system. The last two formed the "Muscle Shoals" project, which was later renamed "Igloo White."

([redacted]) Several days later, at the request of the JCS, Admiral Sharp asked MACV to prepare an operational plan to support the linear barrier. The MACV plan was completed on 26 January and forwarded to the JCS in early February. General Westmoreland estimated that he would require a minimum of 7,691 personnel, 5,731 of them ground troops, to construct the barrier. After reviewing the MACV proposal, the Joint Chiefs (with the exception of General Wheeler) on 22 February 1967 again reiterated their opposition to the project because of its excessive cost both in money and manpower. General Wheeler accepted the Westmoreland plan.*[13]

([redacted]) After reviewing the above comments, on 6 March Secretary McNamara asked the JCS to send him as quickly as possible recommendations for providing the forces needed by MACV. By early March separate service studies indicated that the minimum number of essential personnel required would be 8,353.[14] At the same time, Secretary McNamara directed that required road and port improvements be made to support the plan and that the DCPG start immediately to procure material for the strong points, base camps, and observation posts for at least a limited section of the linear obstacle system.[15]

([redacted]) On 30 March General Starbird directed the Air Force to ready an F-4 squadron to support the system and on 4 April Admiral Sharp forwarded to the Joint Chiefs MACV's schedule for the air-supported anti-infiltration system, which called for an initial operational capability (IOC) by 1 November 1967. However, the JCS recommended to Mr. McNamara that the IOC be

*The basic question raised by the Joint Chiefs was that the barrier system would fundamentally alter existing Southeast Asia war strategy and programs.

postponed until approximately 1 April 1968 when the requisite equipment would be more completely developed. Also, the JCS proposed that the State Department immediately contact the Vietnamese, Laotian, and Thai governments in order to begin negotiations for the required construction, etc.[16]

(T[redacted]) However, on 22 April 1967 Secretary McNamara directed that the air-supported anti-infiltration network be deployed on schedule to meet the 1 November IOC date. At the same time he approved the deployment of 4,319 USAF, 794 Army, and 331 additional Navy personnel.[17]

Deployment Planning

(TS[redacted]) Headquarters USAF originally had planned to base the EC-121 aircraft at Nam Phong, Thailand, but Secretary McNamara disapproved. The JCS then suggested Korat AB, which was acceptable to the Defense Chief (who also directed that Navy OP-2E aircraft be based at Nakhon Phanom or another suitable Thai site).* The mission of the EC-121's--modified to carry major electronic components including receiving, decoding, and display apparatus--was to monitor the anti-infiltration seismic and "acoubuoy" ground sensors. The Air Force planned to have three EC-121's orbiting at one time in order to maintain adequate surveillance of the sensors and to identify any that had been activated by passing enemy troops. This information would be sent to the Infiltration Surveillance Center (ISC)+ to be constructed at Nakhon Phanom AB

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*Less construction would be required at Korat AB and therefore it would not be necessary to open Nam Phong as a complete operational base. South Vietnamese sites were considered (Da Nang, Chu Lai, Phu Cat, Tuy Hoa, and Cam Ranh Bay), but were rejected because of already overcrowded conditions. Also security would have been more difficult in South Vietnam, an exceedingly important consideration. [Memo, Mil Asst, SECDEF, to Mr. McNamara, 3 May 67, subj: Basing for Practice Nine EC-121's.]

+Code name, "Dutch Mill."

in northeast Thailand. On 8 May Secretary McNamara also approved deployment of the several USAF units--F-4 and CH-3C (helicopter) squadrons--to support the anti-infiltration system and concomitantly he directed that the necessary construction be expedited to meet the 1 November operational capability schedule.[18]

([redacted]) Because 10 of the EC-121's required modifications to incorporate the special electronic countermeasures (ECM) equipment, the air-supported anti-personnel subsystem schedule was slipped to 1 December 1967 while the anti-vehicle subsystem IOC remained 1 November.* In August, after AFSC and TAC submitted their initial evaluation of their Eglin tests, Headquarters USAF concluded that a further 30-day postponement would be necessary to 1 January 1968 and 1 December 1967 for the two subsystems.+ Technical difficulties persisted with EC-121 electronic equipment and a problem also arose with the acoustic sensors, which produced many false alarms.[19]

([redacted]) Another important problem was a lack of sufficient time to properly train ISC personnel at Eglin AFB, Fla., prior to their deployment to Thailand. In this connection, on 10 October General McConnell approved formation of a Muscle Shoals Air Force Control Agency to serve as the focal point for USAF Muscle Shoals activities at Eglin AFB. The agency was also designated to serve as the Eglin point of contact for the DCPG and was to establish liaison with other commands and agencies.[20]

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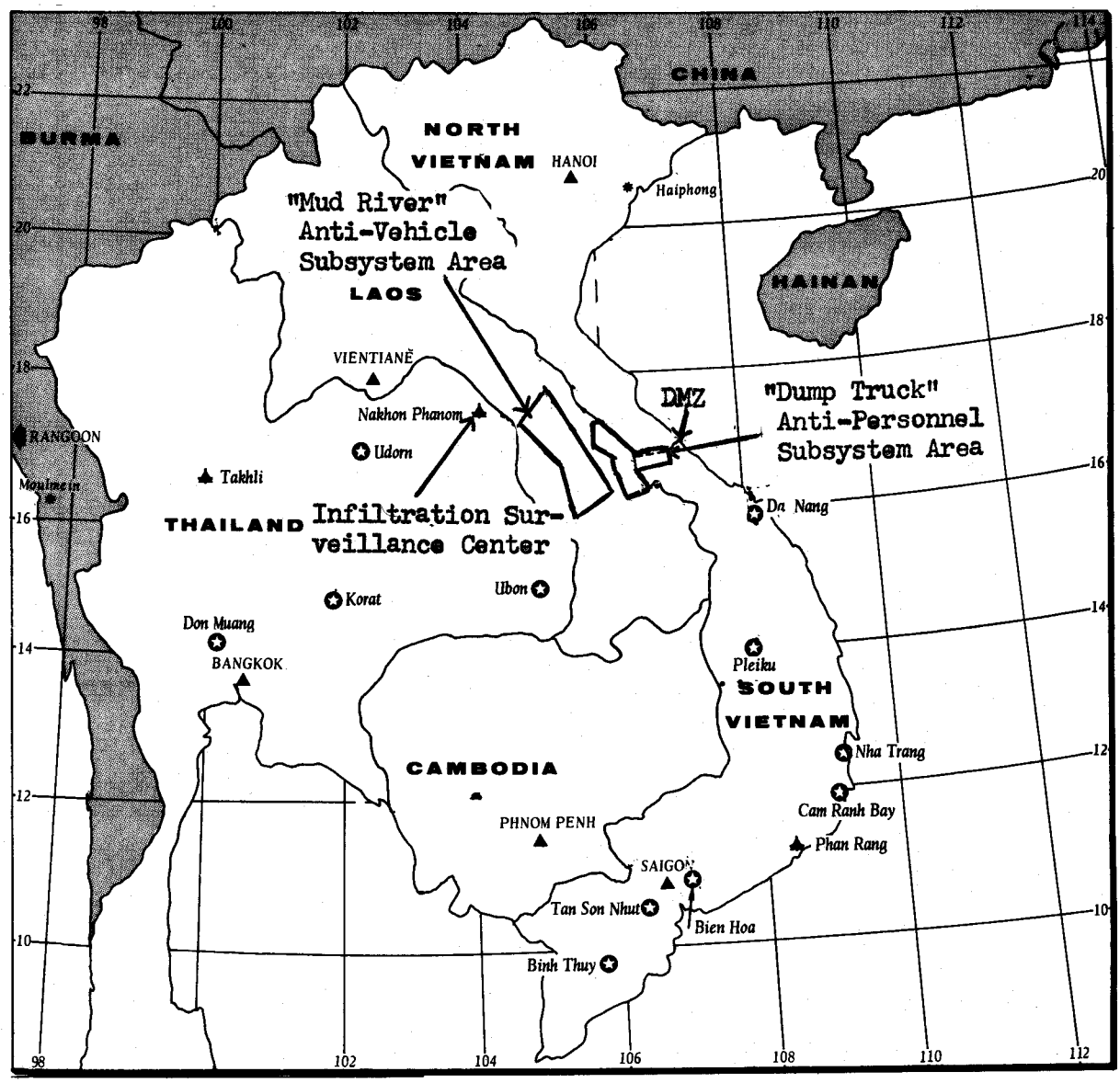
*Advanced ECM equipment was needed to counter enemy SAM's deployed in tne southeast corner of North Vietnam. [Briefing (TS), Lt. Gen. Starbird to SECDEF, 28 Jul 67.]

+The anti-vehicle area ("Mud River") was located in the central backbone of Laos north and south of a line running from the DMZ to a point just below Nakhon Phanom AB. The "Dump Truck" anti-personnel area was on both sides of the DMZ and west into Laos. See map on page 57.

[redacted]

"MUSCLE SHOALS"

Anti-Infiltration System



[redacted]

([redacted]) On 29 August, after the JCS requested a month's postponement in the IOC date, General Starbird agreed that the entire network would gain from the additional time.[21] Following a review of the project by General McConnell, Secretary Brown, Deputy Secretary of Defense Paul Nitze (who succeeded Mr. Vance on 1 July 1967), and General Starbird on 20 September, Mr. McNamara directed that Muscle Shoals resources be deployed in time for a 1 December 1967 IOC for the anti-vehicle portion and 1 January 1968 for the anti-personnel subsystem. He asked that the extra month be given over to intensive CONUS training for the Muscle Shoals air units and ISC personnel. At the same time, theater preparations were to go forward.[22]

([redacted]) Following the Defense Chief's decision, Headquarters USAF decided to deploy six EC-121's to Korat AB in early October to provide maintenance and operational experience before the influx of most of the remaining 15 aircraft in the middle of November.* Initial ISC elements (80 personnel trained at Eglin AFB) were to move to Nakhon Phanom by 10 October with another 90 deploying by 23 October. Eight Navy OP-2E aircraft would arrive at Nakhon Phanom on 10 November after undergoing intensive CONUS training. By December approved Muscle Shoals aircraft and personnel were located at the following Thai bases: at Korat AB, 21 EC-121's; at Nakhon Phanom, eight OP-2E's, 12 CH-3C's, and 19 A-1E's along with 544 personnel for manning the ISC. Eighteen F-4D's also were scheduled to deploy to Ubon AB in March 1968.+[23]

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*Subsequent planning called for a total of 26 EC-121's.

+Deployment of the F-4D's subsequently was postponed to 25 May 1968.

([redacted]) Management of the entire air-supported interdiction effort was assigned to Seventh Air Force. It was to control all air and ground infiltration surveillance in the "Tiger Hound" area of Laos* and small sections north and south of the demilitarized zone. The Infiltration Surveillance Center (designated Task Force Alpha) at Nakhon Phanom would be under the direct command of the task force commander, Brig. Gen. William P. McBride, who would select targets and recommend employment of strike forces by the Seventh Air Force Tactical Air Control Center (TACC). Ground surveillance teams also would be assigned to General McBride from MACV resources.[24]

([redacted]) On 29 September 1967 General McConnell advised General Starbird that more EC-121's would be required in order to enable the aircraft to remain aloft 24 hours a day, each day of the year, over Laos (Tiger Hound) and the DMZ areas of Vietnam. In response, the DCPG established more realistic ground rules so that additional EC-121 aircraft would not be required. During darkness, aircraft monitoring enemy vehicle traffic would orbit at 16,000 feet and during daylight a cruise/climb profile would be held at 16-20,000 feet. Anti-personnel surveillance would be maintained at cruise/climb between 16-20,000 feet. During periods when enemy vehicular traffic was heavy, another night anti-vehicular surveillance aircraft would be kept at 16,000 feet. Under these revised requirements, General Starbird felt that 21 EC-121's would be adequate for the surveillance mission.[25]

([redacted]) The Muscle Shoals deployments generated extensive construction requirements at Korat, including aprons, shops, a communications building addition, and storage and cantonment facilities. At Ubon work began on

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*That part of Laos south of a line that extends from the DMZ west to the border of Thailand.

facilities for ammunition and fuel storage, squadron operations, dormitories, and a special storage building. Ammunition storage, aprons, shops, and cantonment areas were constructed at Nakhon Phanom by the 55th Red Horse squadron. More than $3 million was authorized for Nakhon Phanom construction, including $650,000 for work on the ISC. At Korat, construction work totaling $11,887,000 was authorized and at Ubon, $1,477,000.* [26]

([redacted]) On 1 December anti-vehicle operations began following the dispensing of sensors by OP-2E aircraft; the start of anti-personnel operations, however, was delayed three weeks by Secretary McNamara because of excessive sensor false alarms. Admiral Sharp subsequently advised that the anti-personnel subsystem would begin its functions on 20 January 1968.[27]

Infiltration Surveillance Center

([redacted]) On 21 March 1967 the DCPG directed the Air Force to undertake construction of the Infiltration Surveillance Center at Nakhon Phanom--the central control point for the anti-infiltration system. Data picked up by the EC-121 aircraft from sensors and mines triggered by enemy personnel or vehicles would be relayed to and evaluated by the center, which would be in direct communication with Seventh Air Force Headquarters. Since Secretary McNamara had ordered that construction be expedited, the Air Force awarded a cost plus fixed fee incentive contract and charged AFSC with the responsibility for monitoring the work.+ The 556th Red Horse squadron was authorized an over-hire of 250 local nationals and was later augmented by two more Red Horse teams from Takhli and Korat AB's.[28]

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*Complete funding for the barrier and air-supported network for fiscal year 1967 totaled $373.1 million. The requirement in fiscal year 1968 was set at $434.7 million.

+IBM was the prime system contractor. Surveillance was to be provided by the Air Force Resident Civil Engineer in Thailand.

(S-Gp-2) Although work on the Center was handicapped by heavy monsoon rains, the beneficial occupancy date (BOD) was met in November 1967 and a limited automatic data processing capability (Phase I) acquired. The scheduled operational date for the complete command relay link (complete operational capability) between the EC-121 aircraft and the ISC remained 1 April 1968 (Phase II). Earlier, in mid-1967, JTF 728 directed the Air Force to reprogram $2 million from its current resources in order to insure that long lead time items would be available to meet the 1 April 1968 date.[29]

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GLOSSARY

AB	Air Base
ADU	Aircraft Dispenser Unit
AFB	Air Force Base
AFLC	Air Force Logistics Command
AFR	Air Force Regulation
AFRCE	Air Force Resident Civil Engineer
AFSC	Air Force Systems Command
AGM	Air-to-Ground Missile
BLU	Bomb Live Unit
BOD	Beneficial Occupancy Date
CBU	Cluster Bomb Unit
CINCLANT	Commander-in-Chief, Atlantic
CINCPAC	Commander-in-Chief, Pacific
CINCPACAF	Commander-in-Chief, Pacific Air Forces
CJCS	Chairman, Joint Chiefs of Staff
COC	Complete Operational Capability
COMUSMACTHAI	Commander, U.S. Military Assistance Command, Thailand
COMUSMACV	Commander, U.S. Military Assistance Command, Vietnam
CONUS	Continental United States
CSAF	Chief of Staff, Air Force
CY	Calendar Year
DCPG	Defense Communications Planning Group
DDR&E	Director, Defense Research & Engineering
DMZ	Demilitarized Zone
DOD	Department of Defense
ECM	Electronic Countermeasures
FOB	Forward Operating Base
FY	Fiscal Year
FYDP	Five Year Defense Program
GP	General Purpose
HANDSID	Hand-Delivered Seismic Sensor
HELOSID	Helicopter-Delivered Seismic Sensor
IDA	Institute For Defense Analysis
I&L	Installations and Logistics
IOC	Initial Operational Capability
IRAN	Inspection Repair as Necessary
ISC	Infiltration Surveillance Center
ISIP	Integrated Strike and Interdiction Plan

JCS	Joint Chiefs of Staff
JTF	Joint Task Force
LIMDIS	Limited Distribution
LOE	Level of Effort
MACV	Military Assistance Command, Vietnam
MACTHAI	Military Assistance Command, Thailand
MAP	Military Assistance Program
MCP	Military Construction Program
MOB	Main Operating Base
MOOSE	Move Out of Saigon Earliest
NATO	North Atlantic Treaty Organization
NOA	Non-Operating Active
NOFORN	Not Releasable to Foreign Nationals
NORM	Not Operationally Ready, Maintenance
NORS	Not Operationally Ready, Supply
OA	Operating Active
OICC	Officer-in-Charge of Construction
OSAF	Office of the Secretary of the Air Force
OSD	Office of the Secretary of Defense
PACAF	Pacific Air Forces
PACOM	Pacific Command
PCC	Portland Cement Concrete
POL	Petroleum, Oil, and Lubricants
Prime BEEF	Base Engineering Emergency Force
RED HORSE	Rapid Engineer Deployment-Heavy Operational Repair Squadron, Engineering
RMK-BRJ	Raymond International, New York; Morrison-Knudsen, Boise, Idaho; Brown and Root, Houston, Texas; and J.A. Jones, Charlotte, N.C.
RVN	Republic of Vietnam
SAC	Strategic Air Command
SAF	Secretary of the Air Force
SAM	Surface-to-Air Missile
SEA	Southeast Asia
SECDEF	Secretary of Defense
SMCP	Supplemental Military Construction Program
SOP	Standard Operating Procedure
SPOS	Strong Point Obstacle System

TAC	Tactical Air Command
TACC	Tactical Air Control Center
TDY	Temporary Duty
TPS	Tons Per Sortie
USA	United States Army
USAF	United States Air Force
USAFE	United States Air Forces in Europe
USN	United States Navy
WCDO	War Consumable Distribution Objectives
WG	Wartime Guidance
WR	Wartime Requirements
WRM	War Readiness Materiel
WRSK	War Readiness Spares Kit

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