APPENDIX A Navy Activity Descriptions



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Draft

Environmental Impact Statement/Overseas Environmental Impact Statement Atlantic Fleet Training and Testing

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A. NAVY ACTIVITY DESCRIPTIONS

The Navy has been conducting military readiness activities throughout the northwestern Atlantic Ocean, Gulf of Mexico, and inshore waters for decades. The tempo and types of training and testing activities have fluctuated within the Atlantic Fleet Training and Testing (AFTT) Study Area (Study Area) due to changing requirements, the introduction of new technologies, the dynamic nature of international events, advances in warfighting doctrine and procedures, and force structure changes. Such developments have influenced the frequency, duration, intensity, and location of required training and testing.

A.1 DESCRIPTION OF SONAR, MUNITIONS, TARGETS, AND OTHER SYSTEMS EMPLOYED IN ATLANTIC FLEET TRAINING AND TESTING EVENTS

The Navy uses a variety of sensors, platforms, weapons, and other devices, including ones used to ensure the safety of Sailors and Marines, to meet its mission. Training and testing with these systems may have the potential to introduce acoustic (sound) energy and expended materials into the environment. The environmental impact of these activities was analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS). This appendix presents and organizes sonar systems, munitions, targets, and other systems in a manner intended to facilitate understanding of both the activities that use them and the analysis of their environmental effects, described in Chapter 3 (Affected Environment and Environmental Consequences) of this EIS/OEIS.

A.1.1 SONAR SYSTEMS AND OTHER ACOUSTIC SOURCES

Sonar. Sonar, originally an acronym for "Sound Navigation And Ranging," is a technique that uses underwater sound to navigate, communicate, or detect underwater objects (the term sonar is also used for the equipment used to generate and receive sound). There are two basic types of sonar: active and passive.

Active sonar emits sound waves that travel through the water, reflect off objects, and return to a receiver. Sonar is used to determine the distance to an underwater object by calculating the speed of sound in water and the time for the sound wave to travel to the object and back. For example, active sonar systems are used to track targets or to aid in vessel navigation by identifying known ocean floor features. Some whales, dolphins, and bats use echolocation, a similar technique, to identify their surroundings and to locate prey.

Passive sonar uses listening equipment, such as underwater microphones (hydrophones) and receiving sensors on ships, submarines, aircraft, or autonomous vehicles, to pick up underwater sounds. The advantage of passive sonar is that it places no sound in the water and, thus, does not reveal the location of the listening vessel. Passive sonar can indicate the presence, character, and direction of noise producing objects such as ships and submarines; however, passive sonar is increasingly ineffective as modern submarines become quieter. Passive sonar has no potential acoustic impact on the environment and, therefore, is not discussed further or analyzed within this EIS/OEIS.

All sounds, including sonar, are categorized by frequency. For this EIS/OEIS, active sonar is categorized into four frequency ranges: low-frequency, mid-frequency, high-frequency, and very high-frequency.

- Low-frequency active sonar emits sounds at frequencies less than 1 kilohertz (kHz). Low-frequency active sonar is useful for detecting objects at great distances because low-frequency sounds do not dissipate as rapidly as higher-frequency sounds.
- Mid-frequency active sonar emits sounds at frequencies from 1 to 10 kHz. Mid-frequency active sonar is the Navy's primary tool for detecting and identifying submarines. Active sonar in this frequency range provides a valuable combination of range and target accuracy.
- High-frequency active sonar emits sounds at frequencies greater than 10 kHz, up to 100 kHz.
 High-frequency sounds dissipate rapidly and have a small effective range; however, high-frequency sounds provide higher resolution of objects and are useful at detecting and identifying smaller objects such as sea mines.
- Very high-frequency sources are those that operate above 100 kHz but below 200 kHz. Very high-frequency sounds provide even higher resolution of objects and are sometimes used for underwater communication.

Modern sonar technology includes a variety of sonar sensor and processing systems. In concept, the simplest active sonar emits sound waves, or "pings," sent out in multiple directions, and the sound waves then reflect off of the target object in multiple directions (Figure A.1-1).

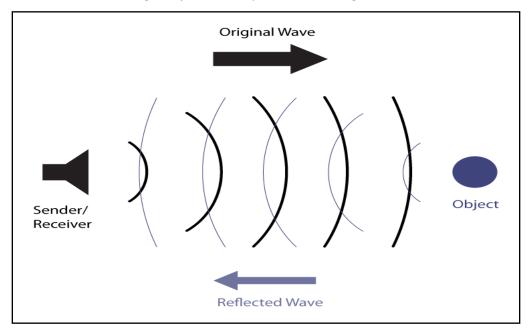


Figure A.1-1: Principle of an Active Sonar

¹ Surveillance Towed Array Sensor System (SURTASS) Low-Frequency Active sonar, which may be used in the Study Area, is not among the sources analyzed in this document. The potential environmental impacts from use of SURTASS Low-Frequency Active sonar are analyzed in separate analyses under the National Environmental Policy Act.

The sonar source calculates the time it takes for reflected sound waves to return; this calculation determines the distance to the target object. More sophisticated active sonars emit a ping and then rapidly scan or listen to the sound waves in a specific area. This provides both distance to the target and directional information. Even more advanced sonars use multiple receivers to listen to echoes from several directions simultaneously and provide efficient detection of both direction and distance. It should be noted that active sonar is rarely used continuously throughout the listed activities. In addition, when sonar is in use, the sonar "pings" occur at intervals, referred to as a duty cycle, and the signals themselves are very short in duration. For example, a sonar that emits a 1-second ping every 10 seconds has a 10 percent duty cycle.

The Navy utilizes sonar systems and other acoustic sensors in support of a variety of mission requirements. Primary uses include detection of and defense against submarines (anti-submarine warfare) and mines (mine warfare), safe navigation and effective communications, and oceanographic surveys. Specific examples of how sonar systems are used for Navy activities are discussed in the following sections.

Anti-Submarine Warfare. Systems used in anti-submarine warfare include sonars, torpedoes, and acoustic countermeasure devices. These systems are employed from a variety of platforms (surface ships, submarines, helicopters, and fixed-wing aircraft). Surface ships conducting anti-submarine warfare are typically equipped with hull-mounted sonar (passive and active) for the detection of submarines (or submarine targets during training and testing events). Helicopters use dipping sonar or sonobuoys (passive and active) to locate submarines (or targets). Fixed-wing aircraft deploy both active and passive expendable sonobuoys to assist in detecting and tracking submarines (or targets). Submarines are equipped with hull-mounted sonars to detect, localize, and track other submarines and surface ships. Submarines primarily use passive sonar; active sonar is used mostly for navigation. There are also unmanned vehicles currently being developed to deploy anti-submarine warfare systems.

Anti-submarine warfare activities often use mid-frequency (1 to 10 kHz) active sonar, though low-frequency and high-frequency active sonar systems are also used for specialized purposes. The Navy is currently developing and testing sonar systems that may utilize lower frequencies and longer duty cycles—albeit at lower source levels—than current systems. However, these new systems would only be operational if they significantly increase the Navy's ability to detect and identify quiet submarine threats.

Typical active sonar systems and acoustic sensors used during anti-submarine warfare sonar training and testing exercises include the following:

• Surface Ship Sonar Systems: A variety of surface ships operate hull-mounted or tethered midfrequency active sonar during training exercises and testing activities (Figure A.1-2). Only cruisers and destroyers have surface ship sonar systems. The littoral combat ship and new frigate will have a tethered variable depth sonar system. Unmanned surface vessels can also include sonar systems, such as the variable depth sonar and mine hunting sonar.

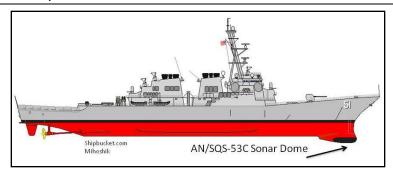


Figure A.1-2: Guided Missile Destroyer with an AN/SQS-53 Sonar

• **Submarine Sonar Systems:** Submarines are equipped with hull-mounted mid-frequency and high-frequency active sonar (Figure A.1-3) used to detect and target enemy submarines and surface ships. A submarine's mission relies on its stealth; therefore, a submarine uses its active sonar sparingly because each sound emission gives away the submarine's location.

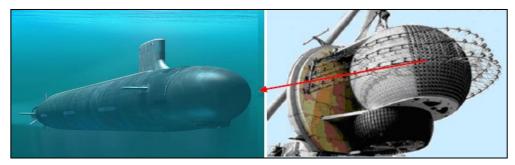


Figure A.1-3: Submarine AN/BQQ-10 Active Sonar Array

- Aircraft Sonar Systems: Aircraft sonar systems include sonobuoys and dipping sonars.
 - Sonobuoys: Active sonobuoys are expendable devices that contain a data transmitter and a hydrophone. The sounds collected by the sonobuoy are transmitted back to the operator (aboard ship or aircraft) for analysis. Sonobuoys are either active or passive and allow for short- and long-range detection of surface ships and submarines. These systems are deployed by ship, helicopter, and fixed-wing patrol aircraft (Figure A.1-4).



Figure A.1-4: Sonobuoy (e.g., AN/SSQ-62)

 Dipping Sonars: Dipping sonars are recoverable devices lowered into the water via cable from manned and unmanned helicopters (Figure A.1-5). The sonar detects underwater targets and determines the distance and movement of the target relative to the position of the helicopter.



Figure A.1-5: Helicopter Deploys Dipping Sonar

• Exercise Torpedoes: Some torpedoes used in training and testing activities may transmit active sonar signals. Surface ships, aircraft, and submarines primarily use torpedoes in anti-submarine warfare (Figure A.1-6). Recoverable, non-explosive torpedoes, categorized as either lightweight or heavyweight, are used during training and testing. Torpedoes operate autonomously, or in the case of heavyweight torpedoes, use a guidance system to operate the torpedo remotely through an attached wire (guidance wire). The autonomous guidance systems operate either passively (listening for sounds generated by the target) or actively (pinging to search for the target). Torpedo training in the Study Area is mostly simulated—solid masses that approximate the weight and shape of a torpedo are fired rather than fully functional torpedoes. Testing in the Study Area mostly uses fully functional exercise torpedoes.

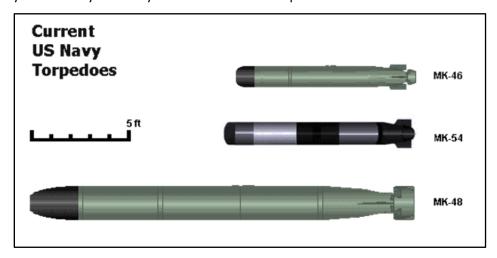


Figure A.1-6: Current United States Navy Torpedoes

• Anti-Submarine Warfare Targets: Anti-submarine warfare targets are autonomous undersea vehicles used to simulate target submarines (Figure A.1-7). The targets are equipped with one or

more of the following devices: (1) acoustic projectors emitting sounds to simulate submarine acoustic signatures, (2) echo repeaters to simulate the characteristics of the echo of a sonar signal reflected from a submarine, or (3) magnetic sources that mimic those of a submarine.



Figure A.1-7: Anti-Submarine Warfare Targets

Mine Warfare. Mine warfare training and testing activities use a variety of different sonar systems that are typically high-frequency (greater than 10 kHz) and very high-frequency (greater than 100 kHz). These sonar systems are used to detect, locate, and characterize moored and bottom mines (Figure A.1-8). The majority of mine warfare sonar sensors can be deployed by more than one platform (e.g., helicopter, unmanned underwater vehicle, or surface ship) and may be interchangeable among platforms. Surface ships and submarines use sonar to detect mines and objects, while minesweeping ships use a specialized variable-depth mine detection and classification high-frequency active sonar system to detect mines.

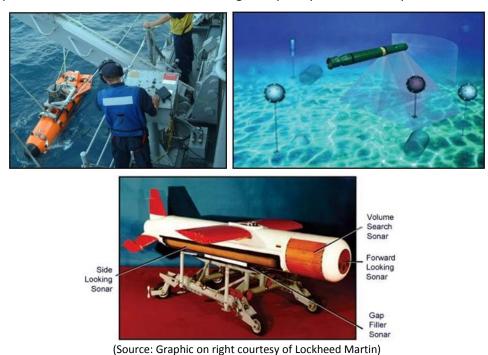


Figure A.1-8: Mine Warfare Systems

Safety, Navigation, Communications, and Oceanographic Systems. Naval ships, submarines, and unmanned surface and subsurface vehicles rely on equipment and instrumentation that use active sonar during both routine operations and training and testing events. Sonar systems are used to gauge water depth; detect and map objects, navigational hazards, and the ocean floor; and transmit communication signals.

Other Acoustic Systems. The Navy uses a variety of other acoustic sensors to protect ships anchored or at the pier, as well as shore facilities. These systems, both active and passive, detect potentially hostile swimmers, broadcast warnings to alert Navy divers of potential hazards, and gather information regarding ocean characteristics (ocean currents and wave measurements). They are generally stationary systems in Navy harbors and piers. Navy marine mammals (Atlantic bottlenose dolphins [*Tursiops truncatus*] and California sea lions [*Zalophus californianus*]) are also used to detect hostile swimmers around Navy facilities. A trained animal is deployed under behavioral control of a handler to find an intruding swimmer. Upon finding the "target" of the search, the animal returns to the boat and alerts the animal handlers, and the animals are given a localization marker or leg cuff that they attach to the intruder. Swimmers that have been marked with a leg cuff are reeled in by security support boat personnel via a line attached to the cuff. In addition, the Navy's research and acquisition community uses various sensors for tracking during testing activities and to collect data for test analysis.

A.1.2 MUNITIONS

Most munitions used during training and testing events fall into three basic categories: projectiles, missiles, and bombs. Munitions can be further defined by their net explosive weight, which is the actual weight in pounds of the explosive substance without the packaging, casings, bullets, etc. Net explosive weight is also the trinitrotoluene (TNT) equivalent of energetic material, which is the standard measure of strength of bombs and other explosives. For example, a 2,000-pound (lb.) bomb may have anywhere from 600 to 1,000 lb. of net explosive weight.

Projectiles. Projectiles are fired during gunnery exercises and testing events from a variety of weapons, ranging from pistols and rifles to large-caliber, turret-mounted guns on the decks of Navy ships. Projectiles can be either high-explosive munitions (e.g., certain cannon shells), or non-explosive practice munitions (e.g., rifle/pistol bullets). Explosive rounds can be fused to either explode on impact or in the air (i.e., just prior to impact). Projectiles are broken down into three basic categories in this EIS/OEIS:

• **Small-Caliber Projectiles:** These projectiles are up to and including 0.50 caliber. Small-caliber projectiles (e.g., bullets) are primarily fired from pistols, rifles, and machine guns (i.e., small arms) and mostly during training events for an individual Sailor to become and remain proficient (Figure A.1-9).





Figure A.1-9: Shipboard Small Arms Training

• Medium-Caliber Projectiles: These projectiles are larger than 0.50 caliber but smaller than 57 millimeter (mm) (approximately 2- to ¼-inch (in.) diameter). The most common size medium-caliber projectiles are 20 mm, 25 mm, and 40 mm. Medium-caliber projectiles are fired from machine guns operated by one to two crewman and mounted on the deck of a ship, wing-mounted guns on aircraft, and fully automated guns mounted on ships for defense against missile attack (Figure A.1-10). Medium-caliber projectiles also include 40 mm grenades, which can be fired from hand-held grenade launchers or crew-served deck-mounted guns. Medium-caliber projectiles can be non-explosive practice munitions or high-explosive projectiles. High-explosive projectiles are usually fused to detonate on impact; however, advanced high-explosive projectiles can detonate based on time, distance, or proximity to a target.





Figure A.1-10: Shipboard Medium-Caliber Guns

• Large-Caliber Projectiles: These includes projectiles 57 mm and larger. The largest projectile currently in service has a 5-in. (12.7-centimeter) diameter, but larger weapons are under development. The most widely used large-caliber projectiles are 57 mm and 5 in. (Figure A.1-11). The most common 5-in. projectile is approximately 26 in. long and weighs 70 lb. Large-caliber projectiles are fired exclusively from turret-mounted guns located on ship decks and can be used to fire on surface ships and boats, in defense against missiles and aircraft, and against land-based targets. Large-caliber projectiles can be non-explosive practice munitions or explosive munitions. High-explosive projectiles can detonate on impact or in the air.





Figure A.1-11: Shipboard Large-Caliber Gun and Projectiles

Missiles. Missiles are rocket or jet-propelled munitions used to attack ships, aircraft, and land-based targets, as well as defend ships against other missiles. Guidance systems and advanced fusing technology ensure that missiles reliably impact on or detonate near their intended target. Missiles are categorized according to their intended target, as described below, and can be further classified according to net explosive weight. Rockets are included within the category of missiles.

• Air Missiles: Air missiles are fired from ships and aircraft against enemy aircraft and incoming missiles (Figure A.1-12). Air missiles are configured to explode in the air near, or on impact with, their intended target. Missiles are the primary ship-based defense against incoming missiles.





Figure A.1-12: Rolling Airframe Missile and Air-to-Air Missile

• **Surface Missiles:** Surface missiles are fired from aircraft, ships, and submarines against surface ships (Figure A.1-13). Surface missiles are typically configured to detonate on impact or just above the intended target.



Figure A.1-13: Anti-Surface Missile Fired from MH-60 Helicopter

- Anti-Radiation Missiles: The AGM-88 High-Speed Anti-Radiation Missile, used to destroy enemy radar sites, is fired at a floating sea-borne target that replicates a land-based radar site.
- **Rockets:** Rockets are fired from helicopters against water and land-based targets. Rockets can either be laser guided or unguided, and while most contain inert warheads there are high-explosive variants that detonate on impact or flechette warheads that open at the conclusion of rocket motor burnout and contain approximately 1,180 60-grain flechettes.

Bombs. Bombs are unpowered munitions dropped from aircraft on land and water targets. The majority of bombs used during training and testing in the Study Area are non-explosive. However, explosive munitions are occasionally used for proficiency inspections and testing requirements. Bombs fall into two categories: general-purpose bombs and subscale practice bombs. Similar to missiles, bombs are further classified according to their net explosive weight.

General-Purpose Bombs: General-purpose bombs consist of precision-guided and unguided full-scale bombs, ranging in size from 250 to 2,000 lb. (Figure A.1-14). Common bomb nomenclature used includes: MK 80 series, which is the Navy's standard model; Guided Bomb Units and Joint Direct Attack Munitions, which are precision-guided (including laser guided) bombs; and the Joint Standoff Weapon, which is a long-range "glider" precision weapon. General-purpose bombs can be either non-explosive practice munitions or high explosive.





Figure A.1-14: F/A-18 Bomb Release and Loading General Purpose Bombs

• Subscale Bombs: Subscale bombs (Figure A.1-15) are non-explosive practice munitions containing a spotting (smoke) charge to aid in scoring the accuracy of hitting the target during training and testing activities. Common subscale bombs are 25 lb. and less and are steel-constructed. Laser guided training rounds are another variation of a subscale practice bomb. They weigh approximately 100 lb. and are cost-effective non-explosive weapons used in training aircrew in laser-guided weapons employment.





Figure A.1-15: Subscale Bombs for Training

Other Munitions. There are other munitions used in naval at-sea training and testing events that do not fit into one of the above categories and are discussed below:

- **Demolition Charges:** Divers place explosive charges in the marine environment during some training and testing activities. These activities may include the use of timed charges, in which the charge is placed, a timer is started, and the charge detonates at the set time. Munitions of up to 60-lb. blocks of composition 4 (C-4) plastic explosive, with the necessary detonators and cords, are used to support mine neutralization, demolition, and other warfare activities. The vast majority of underwater detonations involve explosive charges of 20 lb. or less in size. All demolition charges are further classified according to the net explosive weight of the charge.
- Anti-Swimmer Grenades: Maritime security forces use hand grenades to defend against enemy scuba divers.
- **Torpedoes:** Explosive torpedoes are required in some training and testing events. Torpedoes are described as either lightweight or heavyweight and are further categorized according to the net explosive weight.
- Extended Echo Ranging Sonobuoys: Extended Echo Ranging sonobuoys include mini soundsource seeker sonobuoys that use small explosive charges as the active sound source instead of electrically produced sounds. Extended Echo Ranging sonobuoys are only used in testing activities.

A.1.3 TARGETS

Training and testing require an assortment of realistic and challenging targets. Targets vary from items as simple and ordinary as an empty steel drum used for small-caliber weapons training from the deck of a ship, to sophisticated, unmanned aerial drones used in air defense training. For this EIS/OEIS, targets are organized by warfare area.

Air Warfare Targets: Air warfare targets, tow target systems, and aerial targets are used in training and testing events that involve detection, tracking, defending against, and attacking enemy missiles and aircraft. Aerial tow target systems include textile (nylon banner) and rigid (fiberglass shapes) towed targets used for gunnery events. Aerial targets include expendable ballistic targets and recoverable radio-controlled drones used for gunnery and missile exercises (Figure A.1-16). Parachute flares are used as air-to-air missile targets. Manned high-performance aircraft may be used as targets—to test ship and aircraft defensive systems and procedures—without the actual firing of munitions.





Figure A.1-16: Deployment and Recovery of Air Warfare Targets

Surface Warfare Targets: Floating, towed, and mobile targets are used as surface warfare targets during gunnery events. Targets include floating steel drums, inflatable shapes or target balloons (e.g., Killer Tomato™) (Figure A.1-17), and towed sleds. High-speed targets, such as jet skis and motorboats, are also used (Figure A.1-18).



Figure A.1-17: Deploying a "Killer Tomato™" Floating Target





Figure A.1-18: Ship Deployable Surface Target and High-Speed Maneuverable Seaborne Target

Anti-Submarine Warfare Targets: Anti-submarine warfare uses multiple types of targets, including the following:

- Submarines: Submarines may act as tracking and detection targets during training and testing events.
- **Motorized Autonomous Targets:** Motorized autonomous targets simulate the acoustic and magnetic characteristics of a submarine, providing realism for exercises when a submarine is not available. There are two types of mobile targets, one is designed for recovery and reuse, while the other is expendable.
- Stationary Artificial Targets: Stationary targets either resemble submarine hulls or are simulated systems with acoustic properties of enemy submarines. These targets either rest on the seafloor or are suspended at varying depths in the water column.

Mine Warfare Targets: Mine targets are used in training activities that involve the detection, location, and neutralization of mines in the water. There are a wide variety of mine targets that mimic floating, bottom, and moored mines. All mine targets are made out of inert material.

A.1.4 DEFENSIVE COUNTERMEASURES

Naval forces depend on effective defensive countermeasures to protect against missile and torpedo attack. Defensive countermeasures are devices designed to confuse, distract, and confound precision-guided munitions. Defensive countermeasures fall into five basic categories:

- Chaff: Chaff consists of reflective, aluminum-coated glass fibers used to obscure ships and aircraft from radar-guided systems. Chaff, which is stored in canisters, is either dispensed from aircraft or fired into the air from the decks of surface ships when an attack is imminent. The glass fibers create a radar cloud that masks the position of the ship or aircraft.
- **Flares:** Flares are pyrotechnic devices used to defend against heat-seeking missiles, where the missile seeks out the heat signature from the flare rather than the aircraft's engines. Similar to chaff, flares are also dispensed from aircraft and fired from ships.
- Acoustic Countermeasures: Acoustic countermeasures are used by surface ships and submarines to defend against torpedo attack (Figure A.1-19). Acoustic countermeasures are either released from ships and submarines or towed at a distance behind the ship.
- **Electromagnetic Countermeasures:** Electromagnetic countermeasures are used by surface ships and aircraft to defend against missile attacks. Electromagnetic countermeasures are also used in anti-submarine warfare activities.
- Biodegradable Polymer: Biodegradable polymer is a biodegradable vessel entanglement technology used to slow or stop specific maritime targets by entangling the propulsion mechanism.

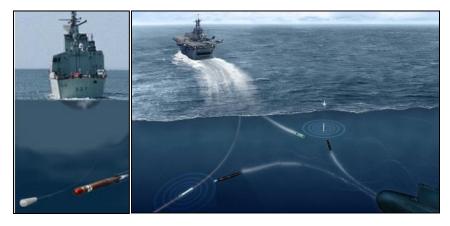


Figure A.1-19: Acoustic Countermeasures

A.1.5 MINE WARFARE SYSTEMS

Mine warfare systems fall into two broad categories: mine detection and mine neutralization.

Mine Detection Systems. Mine detection systems are used to locate, classify, and map suspected mines. Once located, the mines can either be neutralized or avoided. These systems are specialized to either locate mines on the surface, in the water column, or on the sea floor.

• Towed or Hull-Mounted Mine Detection Systems: These detection systems use acoustic and laser or video sensors to locate and classify suspect mines. Helicopters, ships, and unmanned vehicles are used for towed systems, which can rapidly assess large areas (Figure A.1-20).

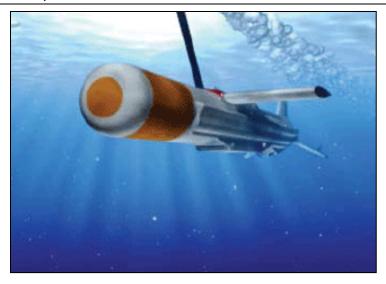


Figure A.1-20: Towed Mine Detection System

• **Airborne Laser Mine Detection Systems:** Airborne laser detection systems work in concert with neutralization systems. The detection system initially locates mines, and a neutralization system is then used to relocate and neutralize the mine (Figure A.1-21).

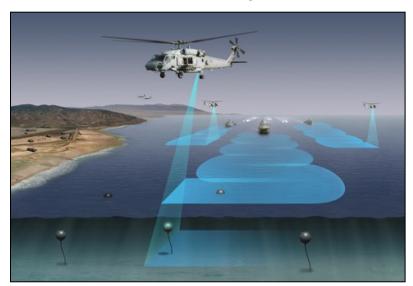


Figure A.1-21: AN/AES-1 Airborne Laser Mine Detection System

- Unmanned/Remotely Operated Vehicles: These vehicles use acoustic, video, or lasers, or combinations thereof, to locate and classify mines. Unmanned/remotely operated vehicles provide unique mine warfare capabilities in nearshore littoral areas, surf zones, ports, and channels.
- Marine Mammal System: Navy personnel and Navy marine mammals work together to detect specified underwater objects. The Navy deploys trained bottlenose dolphins and California sea lions as part of the marine mammal minehunting and object recovery system.

Mine Neutralization Systems. These systems disrupt, disable, or detonate mines to clear ports and shipping lanes, as well as littoral, surf, and beach areas in support of naval amphibious operations. Mine neutralization systems can clear individual mines or a large number of mines quickly.

• **Towed Influence Mine Sweep Systems:** These systems use towed equipment that mimics a particular ship's magnetic and acoustic signature, triggering the mine and causing it to explode (Figure A.1-22).

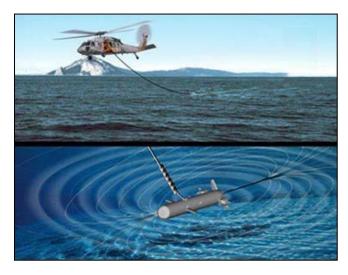


Figure A.1-22: Organic and Surface Influence Sweep

- Towed Mechanical Mine Sweeping Systems: These systems tow a sweep wire to snag the line
 that attaches a moored mine to its anchor and then uses a series of cables and cutters to sever
 those lines. Once these lines are cut, the mines float to the surface where explosive ordnance
 personnel can neutralize the mines.
- Unmanned/Remotely Operated Mine Neutralization Systems: Surface ship and helicopters
 operate these systems, which place explosive charges near or directly against mines to destroy
 the mine (Figure A.1-23).

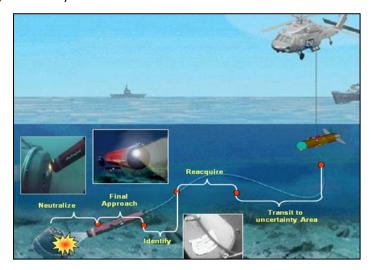


Figure A.1-23: Airborne Mine Neutralization System

- Projectiles: Small- and medium-caliber projectiles fired from surface ships or hovering helicopters are used to neutralize floating and near-surface mines.
- Diver-Placed Explosive Charges: Operating from small craft, divers place explosive charges, which may use time-delay fusing, near or on mines to destroy the mine or disrupt its ability to function.

A.1.6 MILITARY EXPENDED MATERIALS

Navy training and testing events may introduce or expend various items, such as non-explosive munitions and targets, into the marine environment as a direct result of using these items for their intended purpose. In addition to the items described below, some accessory materials—related to the carriage or release of these items—may be released. These materials, referred to as military expended materials, are not recovered and potentially result in environmental impacts. These impacts are analyzed in detail in Chapter 3 (Affected Environment and Environmental Consequences) of this EIS/OEIS. This section includes descriptions of a representative sample of military expended materials. A more comprehensive discussion can be found in Chapter 3 (Affected Environment and Environmental Consequences).

Military expended materials analyzed in this document include the following:

- **Sonobuoys:** Sonobuoys consist of decelerators/parachutes, wires, and the sonobuoys themselves.
- **Bathythermographs:** Bathythermographs as used by the Navy are similar to sonobuoys in that they consist of decelerators/parachutes, wires, and the buoy themselves. In the case of bathythermographs, the buoys are used to measure temperature information of the water column and transmit that information to the platform (usually a ship or aircraft) that deployed the bathythermograph.
- Torpedo Launch Accessories: Torpedoes are usually recovered; however, materials such as
 decelerators/parachutes used with air-dropped torpedoes, guidance wire used with submarinelaunched torpedoes, and ballast weights are expended. Explosive-filled torpedoes expend
 torpedo fragments.
- Projectiles and Bombs: Non-explosive projectiles, non-explosive bombs, or fragments from
 explosive projectiles and bombs are expended during training and testing events. These items
 are primarily constructed of lead (most small-caliber projectiles) or steel (medium- and largecaliber projectiles and all bombs). Casings are expended as a result of firing either non-explosive
 or explosive projectiles.
- Blank Ammunition: Blank ammunition is used in some training activities when the sound or flash of gunfire adds to the realism of the training activity but safety of personnel or nearby civilians is critical. Blank ammunition contains gunpowder, but no projectile is sent downrange upon firing the weapon. Casings are expended as a result of firing blank ammunition.
- Missiles and Rockets: Non-explosive missiles and missile fragments from explosive missiles are
 expended during training and testing events. Propellant, and any explosive material involved, is
 consumed during firing/detonation. Rockets are similar to missiles and both non-explosive and
 fragments may be expended.

- Countermeasures: Countermeasures (acoustic, chaff, flares, and biodegradable polymer) are
 expended as a result of training or testing events, with the exception of towed acoustic
 countermeasures. Chaff activities also include an expended canister, end caps, and pistons.
 Flares expend only end caps and pistons.
- Targets: Some targets are designed to be expended; other targets, such as aerial drones and remote-controlled boats, are recovered for re-use. Targets struck with munitions will result in target fragments.

A.2 TRAINING ACTIVITIES

The Navy's training activities are organized generally into seven primary mission areas and a miscellaneous category ("Other Training") that includes those activities that do not fall within a primary mission area but are an essential part of Navy training. In addition, because the Navy conducts a number of activities within larger training exercises, descriptions of those larger exercises are also included here. It is important to note that these larger exercises are composed entirely of individual activities described in the primary mission areas.

A.2.1 Major Training Exercises

A major anti-submarine warfare training exercise comprises several "unit-level" range exercises conducted by several units operating together while commanded and controlled by a single commander. These exercises typically employ an exercise scenario developed to train and evaluate the strike group in naval tactical tasks. In a major training exercise, most of the operations and activities being directed and coordinated by the strike group commander are identical in nature to the operations conducted during individual, crew, and smaller-unit training events. In a major training exercise, however, these disparate training tasks are conducted in concert, rather than in isolation.

Major training exercises are listed below.

A.2.1.1 Composite Training Unit Exercise

Major Training	Major Training Exercises – Large Integrated Anti-Submarine Warfare					
Composite Trai	ning Unit Exercise					
Short	Aircraft carrier and carrier air wing integrate with Typical Duration					
Description	surface and submarine units in a challenging multi- threat operational environment that certifies them ready to deploy.	21 days				
Long Description	Intermediate level carrier strike exercise designed to create a cohesive strike group prior to deployment or Joint Task Force Exercise. Typically employs seven surface ships, fixed-wing aircraft					
	and helicopters, two submarines, and various unmar					
	Each strike group performs a rehearsal called Composite Training Unit Exercise before deployment. Prior to the Composite Training Unit Exercise, each ship and aircraft in the strike group trains in their specialty. The Composite Training Unit Exercise is an intermediate-level strike group exercise designed to forge the group into a cohesive fighting team. Composite Training Unit Exercise normally consists of an 18-day schedule of event-driven exercise, and a 3-day Final Battle Problem.					
	The Composite Training Unit Exercise is an integration the Carrier Strike Group, this exercise integrates the surface and submarine units in a challenging operation may also be integrated with the exercise scenario.	aircraft carrier and carrier air wing with				

Adaina Turinina	Formula and I among the Among Andrews	0 4.1 C C	- \A/f		_		
	Exercises – Large Integrated A	Anti-Submarir	ne wartare				
Composite Trai	ning Unit Exercise						
	For Composite Training Unit Exercise only, the anti-submarine warfare activities were analyzed as a Composite Training Unit Exercise. Other warfare area training conducted during the Composite Training Unit Exercise is analyzed elsewhere as unit-level training (gunnery exercises, missile						
Typical Components	exercises, etc.). Platforms: Aircraft carriers, fixed-wing aircraft, rotary-wing aircraft, submarines, surface combatants Targets: Sub-surface targets Systems being Trained/Tested: Sonar systems						
Standard	Vessel safety	Typical Loca					
Operating Procedures (Section 2.3.3)	Aircraft safety Towed in-water device safety	Range Complexes/Testing Ranges: In			Inland Waters/Pierside: None		
Stressors to Biological Resources	Acoustic: Sonar and other transducers Aircraft noise Vessel noise Explosives:	Physical Disturbance and Strike: Aircraft and aerial targets Vessels and in-water devices Military expended materials Ingestion: Military expended materials – other			Energy: In-air electromagnetic devices In-water electromagnetic devices Entanglement:		
	None	than munitions			Wires and cables Decelerators/parachutes		
Stressors to Physical Resources	Air Quality: Criteria air pollutants Metals Other materials Habitats: Physical disturbance and strike – military expended material						
Stressors to Human Resources	None	-		-			
Military Expended Material	Ingestible Material: Small decelerators/parachut Non-Ingestible Material: Acoustic countermeasures, of bathythermographs, expending bathythermograph wires,	expendable endable	Military Recoverable Material	Sub-sui	face targets		
	(non-explosive), sonobuo	-					

Major Training	Major Training Exercises – Large Integrated Anti-Submarine Warfare					
Composite Trai	ning Unit Exercise					
Sonar and	Low-Frequency:	Anti-Subm	Anti-Submarine Warfare:			
Other	LF6	ASW1	ASW4			
Transducer		ASW2	ASW5			
Bins	Mid-Frequency:	ASW3				
	MF1 MF5					
	MF3 MF11					
	MF4 MF12					
	High-Frequency:					
	HF1					
In-Water	Analyzed in individual unit-level training events.					
Explosive						
Bins						
Procedural	Acoustic Stressors: (Section S	5.3.2)				
Mitigation	Active sonar					
Measures						
	Physical Disturbance and Strike: (Section 5.3.4)					
	Vessel movement					
	Towed in-water devices					
Assumptions	For Composite Training Unit	Exercise, only t	he anti-submarine warfare activities were analyzed as a			
Used for	_		rfare area training conducted during the Composite			
Analysis	Training Unit Exercise was ar	nalyzed as unit-	level training (gunnery exercise, missile exercise, etc.).			
	Stressors to human resource	s were not ana	lyzed for this activity since it occurs greater than 12 NM			
	from shore.					

A.2.1.2 Fleet Exercise/Sustainment Exercise

Included in the Fleet Response Training Plan is a requirement to conduct post-deployment training, and maintenance. This ensures that the components of a strike group maintain an acceptable level of readiness after returning from deployment. A sustainment exercise is an exercise designed to challenge the strike group in all warfare areas. Marine mammal systems may be used during the exercise. This exercise is similar to a Composite Training Unit Exercise but is of shorter duration.

	Exercises – Medium Integrate	ed Anti-Submarine Warfa	ire		
Fleet Exercise/S	Sustainment Exercise				
Short	Aircraft carrier and carrier a	ir wing integrates with	Typical Dura	ation	
Description	surface and submarine units				
	threat operational environm	nent to maintain ability	Up to 10 day	/S	
	to deploy.				
Long	Fleet Exercises and Sustainn	nent Exercises are similar	in scope to Co	omposite Training Unit Exercises	
Description				rcises are integrated joint and	
	_	_	-	maritime warfare disciplines.	
				Group maintains an acceptable	
		• • •	order to maii	ntain a surge capability. Marine	
	mammal systems may be us	_			
		explosives in the Fleet Ex	ercises and Su	ustainment Exercises is included in	
	unit-level events.				
Typical		_	y-wing aircraft	t, submarines, surface combatants	
Components	Targets: Sub-surface targets				
	Systems being Trained/Test	·			
Standard	Vessel safety	Typical Locations			
Operating	Aircraft safety	Range Complexes/Test	ing Ranges:	Inland Waters/Pierside:	
Procedures	Towed in-water device	Jacksonville	ing nunges.	None	
(Section 2.3.3)	safety	Navy Cherry Point			
		Virginia Capes			
Stressors to	Acoustic:	Physical Disturbance a	nd Strike:	Energy:	
Biological	Sonar and other	Aircraft and aerial targ		In-air electromagnetic	
Resources	transducers	Vessels and in-water d		devices	
	Aircraft noise	Military expended mat	erials	In-water electromagnetic	
	Vessel noise			devices	
		Ingestion:			
	Explosives:	Military expended mat	erials – other	Entanglement:	
	None	than munitions		Wires and cables	
				Decelerators/parachutes	
Stressors to	Air Quality:	Sedimen	ts and Water	Quality:	
Physical	Criteria air pollutants	Metals		Chemicals	
Resources		Other ma	aterials		
	Habitats:				
	Physical disturbance and stri	ke – military			
	expended material				
Stressors to	None				
Human					
Resources					

Major Training Exercises – Medium Integrated Anti-Submarine Warfare Fleet Exercise/Sustainment Exercise					
Military Expended Material	Ingestible Material: Small decelerators/parachutes Non-Ingestible Material: Acoustic countermeasures, sonobuoys (non-explosive), sonobuoy wires	Military Recoverable Material	Sub-surface targets		
Sonar and Other Transducer Bins	LF6 ASW1 Mid-Frequency: ASW2 MF1 MF5	omarine Warfare: ASW4 equency:			
In-Water Explosive Bins	Analyzed in individual unit-level training e	vents.			
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3.2) Active sonar	Vessel	al Disturbance and Strike: (Section 5.3.4) movement in-water devices		
Assumptions Used for Analysis	Only the anti-submarine warfare activities Other warfare area training conducted du analyzed as unit-level training (gunnery ex Stressors to human resources were not as	ring the Fleet Exe kercise, missile ex	ercise/Sustainment Exercise was ercise, etc.).		
	from shore.	iaiyzeu ioi tiils at	civity since it occurs greater triall 12 MM		

A.2.2 INTEGRATED/COORDINATED TRAINING

Integrated or coordinated anti-submarine warfare training exercises are similar to major training exercises in that they are composed of several basic, unit-level exercises, training conducted by an individual unit, but are generally on a smaller scale, are of shorter duration, and use fewer hours of active sonar than a major training exercise.

A.2.2.1 Navy Undersea Warfare Training and Assessment Course

Small Integrated Anti-Submarine Warfare Training						
Navy Undersea	Warfare Training and Assessi	ment Course				
Short	Multiple ships, aircraft, and	submarines integrate	Typical Dura	tion		
Description	the use of their sensors, including sonobuoys, to					
	search for, detect, classify, localize, and track a 2-5 days					
	threat submarine.					
Long	The Navy Undersea Warfare	=				
Description	_			egrated anti-submarine warfare		
	warfighting skill sets. Navy L training scenario that typica		_			
	_		-	, and attacking one submarine.		
		· ·		s per year. The submarine may		
				ull-mounted, towed array, and		
	· · ·	= -	-	also periodically operates its		
	sonar.					
Typical	Platforms: Fixed-wing aircra	ft, rotary-wing aircraft, su	ubmarines, sur	face combatants		
Components	Targets: Sub-surface targets					
	Systems being Trained/Test					
Standard	Vessel safety	Typical Locations				
Operating	Aircraft safety	Range Complexes/Test	ing Ranges:	Inland Waters/Pierside:		
Procedures (Section 2.3.3)	Towed in-water device safety	Jacksonville None				
(36011011 2.3.3)	Salety	Navy Cherry Point				
		Virginia Capes				
Stressors to	Acoustic:	Physical Disturbance a		Energy:		
Biological	Sonar and other	Aircraft and aerial targe		In-air electromagnetic		
Resources	transducers	Vessels and in-water de		devices		
	Aircraft noise Vessel noise	Military expended mat	eriais	In-water electromagnetic devices		
	vesserrioise	Ingestion:		uevices		
	Explosives:	Military expended mat	terials – other	Entanglement:		
	None	than munitions Wires and cables				
				Decelerators/parachutes		
Stressors to	Air Quality:	Sedimen	ts and Water (Quality:		
Physical	Criteria air pollutants	Metals		Chemicals		
Resources		Other materials				
	Habitats:	1 119				
	Physical disturbance and stri expended material	ke – military				
Stressors to	None					
Human	NOTE					
Resources						
courtes						

Small Integrate	Small Integrated Anti-Submarine Warfare Training						
Navy Undersea	Warfare Training and Assessmer	t Course					
Military	Ingestible Material:		Military				
Expended	Small decelerators/parachutes		Recoverab	ole	Some sub-surface targets		
Material			Material				
	Non-Ingestible Material:						
	Sub-surface targets, surface targ	gets,					
	sonobuoys (non-explosive),						
	sonobuoy wires						
Sonar and	Mid-Frequency:	High-Fre	quency:		Anti-Submarine Warfare:		
Other	MF1 MF5	HF1			ASW1		
Transducer	MF3 MF12	Low-Free	auencv:		ASW3		
Bins	MF4	LF6	.,		ASW4		
In-Water	Analyzed in individual unit-level	training e	vents.				
Explosive							
Bins							
Procedural	Acoustic Stressors: (Section 5.3.	2)	Pł	hysica	Disturbance and Strike: (Section 5.3.4)		
Mitigation	Active sonar		Ve	essel r	novement		
Measures	Towed in-water devices			in-water devices			
Assumptions	Two MK-39 Expendable Mobile Anti-Submarine Warfare Training Targets may be used in place						
Used for	of an actual submarine target.						
Analysis	Air deployed sonobuoys will hav	e a decele	erator/parac	hute.			
	Stressors to human resources w	ere not an	alyzed for t	his act	tivity since it occurs greater than 12		
	NM from shore.						

A.2.2.2 Surface Warfare Advanced Tactical Training

Small Integrate	d Anti-Submarine Warfare Tra	aining					
	e Advanced Tactical Training						
Short	Multiple ships and aircraft of	oordinate the use of	Typical Duration				
Description	sensors, including sonobuoy		,,				
	and track a threat submarin						
	Advanced Tactical Training 6	exercises are not	Up to 15 days				
	dedicated anti-submarine w	arfare exercises and					
	involve multiple warfare are	as.					
Long	Surface Warfare Advanced 1	Tactical Training (SWATT) is an intermediate training exercise designed					
Description	primarily to increase operate	marily to increase operator proficiency and exercise combined force responses to surface					
	warfare, anti-submarine warfare, air warfare and electromagnetic spectrum operations.						
	Surface Warfare Advanced 1	actical Training is conduc	ted after a carri	ier strike group's first Group			
	Sail, and before Composite	Training Unit Exercise, and	d consists of mu	ltiple surface warfare, anti-			
	submarine and air warfare li	ve fire events. Multiple sl	nips and aircraft	t search for, locate, and track			
	one submarine. Occurs once per carrier strike group training cycle.						
	Use of other munitions and						
Typical	Platforms: Surface combata	nts, fixed-wing aircraft, ro	tary-wing aircra	aft, unmanned vehicles,			
Components	submarines						
	Targets: Sub-surface targets						
	Systems being Trained/Test	ed: Sonar systems					
Standard	Vessel safety	Typical Locations					
Operating	Aircraft safety	Range Compleyes/Test	ing Ranges:	Inland Waters/Pierside:			
Procedures	Towed in-water device	Range Complexes/Testing Ranges Jacksonville		None			
(Section 2.3.3)	safety	Navy Cherry Point		. Tone			
		Virginia Capes					
Stressors to	Acoustic:	Physical Disturbance a	nd Strike:	Energy:			
Biological	Sonar and other	Vessels and in-water de		In-air electromagnetic			
Resources	transducers	Military expended mate	erials	devices			
	Aircraft noise	In-water electromagnetic					
	Vessel noise	Ingestion:		devices			
		Military expended mate	Military expended materials – other				
	Explosives:	than munitions		Entanglement:			
	None			Wires and cables			
				Decelerators/parachutes			
Stressors to	Air Quality:	Sediments and Water Quality:					
Physical	Criteria air pollutants	Metals	Chemicals				
Resources		Other materials					
	Habitats:						
	Physical disturbance and strike – military						
	expended material						
Stressors to	None						
Human							
Resources							

Small Integrated Anti-Submarine Warfare Training					
Surface Warfar	e Advanced Tactical Training				
Military	Ingestible Material:	Military	Anti-submarine warfare targets		
Expended	Target fragments, small	Recoverable	Some sub-surface targets		
Material	decelerators/parachutes	Material			
	Non-Ingestible Material: Sonobuoys (non-explosive), sonobuo wires, acoustic countermeasures, sub-surface targets	1			
Sonar and		I i-Submarine Warfar	e: High-Frequency:		
Other	MF1 MF5MF1K MF6 ASV		HF1		
Transducer	MF3 MF12 ASV	- ,,,,,,,,	2		
Bins	MF4		Acoustic Modems:		
			M3		
In-Water Explosive Bins	Analyzed in individual unit-level training events.				
Procedural	Acoustic Stressors: (Section 5.3.2)	Physic	cal Disturbance and Strike: (Section 5.3.4)		
Mitigation	Active sonar Vessel movement				
Measures		Towe	d in-water devices		
Assumptions	Only the anti-submarine warfare acti	vities were analyzed	as a SWATT. Other warfare area training		
Used for	conducted during SWATT was analyzed as unit-level training (gunnery exercises, missile exercises,				
Analysis	etc.).				
	Stressors to human resources were not analyzed for this activity since it occurs greater than 12 NM from shore.				

A.2.2.3 Anti-Submarine Warfare Tactical Development Exercise

Medium Coord	Medium Coordinated Anti-Submarine Warfare Training					
Anti-Submarine	Anti-Submarine Warfare Tactical Development Exercise					
Short	Multiple ships, aircraft, and	submarines co	oordinate	Турі	ical Duration	
Description	their efforts to search for, d	etect, and tra	ck			
	submarines with the use of	all sensors. Ar	nti-	-	dava	
	Submarine Warfare Tactical	Development	Exercise	5-7 c	days	
	is a dedicated anti-submarir	ne warfare exe	ercise.			
Long					fforts to search for, detect, and track	
Description					arfare Tactical Development Exercise is a	
					and aircraft. Active and passive sonar and	
					aining exercises. The purpose of the	
			-	forma	ance and capability among various units	
	operating together in a spec					
Typical	Platforms: Fixed-wing aircra		g aircraft, su	ırface	e combatants, submarines	
Components	Targets: Sub-surface targets					
	Systems being Trained/Test			uoys,	, acoustic countermeasures	
Standard	Vessel safety	Typical Loca	tions			
Operating	Aircraft safety	Range Com	plexes/Test	ing Ra	anges: Inland Waters/Pierside:	
Procedures	Towed in-water device	Jacksonville			None	
(Section 2.3.3)	safety	Navy Cherry	/ Point			
		Virginia Cap	es			
Stressors to	Acoustic:	Physical Dis	sturbance a	nd Str	rike: Energy:	
Biological	Sonar and other	Aircraft and	l aerial targe	ets	In-air electromagnetic	
Resources	transducers	Vessels and	in-water de	evices	devices	
	Aircraft noise	Military exp	ended mat	erials	In-water electromagnetic	
	Vessel noise	devices				
		Ingestion:				
	Explosives:	Military expended materials – other Entanglement:				
	None				Wires and cables	
		Decelerators/parachutes				
Stressors to	Air Quality:	Sediments and Water Quality:				
Physical	Criteria air pollutants		Metals		Chemicals	
Resources	Habitata.		Other ma	iteriai	IS	
	Habitats:	برم جنانجم مان				
	Physical disturbance and strike – military					
	expended material					
Stressors to	None					
Human						
Resources						
Military	Ingestible Material:		Military			
Expended	Target fragments, small Reco			ble	Anti-submarine warfare targets	
Material	decelerators/parachutes	i	Material]	
	Non-Ingestible Material:					
	Sonobuoys (non-explosive),	-				
	wires, acoustic counterm	neasures				

Medium Coordinated Anti-Submarine Warfare Training						
Anti-Submarine Warfare Tactical Development Exercise						
Sonar and	Low-Frequency:	High-Frequency:		Acoustic Modems:		
Other	LF6	HF1		M3		
Transducer	Mid-Frequency:	Anti-Submarine Warfare:				
Bins	MF1 MF5 MF3 MF11 MF4 MF12	ASW1 ASW3	ASW4			
In-Water Explosive Bins	Analyzed in individual unit-level training events.					
Procedural Mitigation	Acoustic Stressors: (Section 5.3.2) Active sonar		•	Physical Disturbance and Strike: (Section 5.3.4) Vessel movement		
Measures	Towed in-water devices					
Assumptions	Only the anti-submarine warfare activities were analyzed as an Anti-Submarine Warfare Tactical					
Used for	Development Exercise. Other warfare area training conducted during the exercise was analyzed as					
Analysis	unit-level training.					
	Stressors to human resources were not analyzed for this activity since it occurs greater than 12 NM					
	from shore.					

A.2.2.4 Amphibious Ready Group Marine Expeditionary Unit Exercise

Small Coordina	ted Anti-Submarine Warfare	Training				
	ady Group Marine Expedition		ise			
Short	Navy and Marine Corps forc			Typical Du	uration	
Description	training at sea in preparation		_	5-7 days		
Long		ous ships and embarked Marine Expeditionary Units train to a multitude of scenarios to				
Description		amphibious force. Operations include ship to shore movement with ng Craft Air Cushion vessels. Marine Corps forces conduct more advanced				
Description						
	-	rations to include small boat raids; visit, board, search, and seizure training; nechanized amphibious raids; and non-combatant evacuation operations. nerally occurs during an Expeditionary Strike Group Composite Training Unit tary expended materials, explosives, and use of other munitions in Amphibious				
	T					
	T					
	Exercise. All military expend					
	Ready Group Marine Expeditionary Unite Exercise are included in unit-level events.					
Typical	Platforms: Amphibious warf	are ships, fixed	l-wing aircra	aft, rotary-	wing aircraft, small boats, surface	
Components	combatants, tiltrotor aircraft	t				
	Targets: None					
	Systems Being Trained/Test	1				
Standard	Vessel	Typical Locat	ions			
Operating Procedures	Aircraft safety Towed in-water device	Range Comp	lexes/Testi	ng Ranges:	: Inland Waters/Pierside:	
(Section 2.3.3)	safety	Navy Cherry	Point		None	
(3600011 2.3.3)	Salety					
Stressors to	Acoustic:	Physical Dist	turbance an	d Strike:	Energy:	
Biological	Sonar and other	Aircraft and			In-air electromagnetic	
Resources	transducers	Vessels and in-water devices devices				
	Aircraft noise	Military expe	In-water electromagnetic			
	Vessel noise			devices		
	Fundaciones	Ingestion: Military expended materials – other				
	Explosives: None	than mur		er Entanglement: Wires and cables		
	None	tilali illui	11110113	Decelerators/parachutes		
Stressors to	Air Quality:	Sediments and Water Quality:				
Physical	Criteria air pollutants	Metals Chemicals				
Resources	, , , , , , , , , , , , , , , , , , ,	Other materials				
	Habitats:					
	Physical disturbance and s	strike –				
	military expended mat	terial				
Stressors to	None					
Human						
Resources						
Military	Ingestible Material:		Military Recoverab		-submarine warfare targets	
Expended	Small decelerators/parachut	tes				
Material	Non Ingontible 84-41-1	Material				
	Non-Ingestible Material: Sonobuoys, acoustic counter					
Sonar and	Low-Frequency:	-	allency.		<u> </u>	
Other	LF6	High-Frequency: HF1				
Transducer	Mid-Frequency:	лгі Anti-Submarine Warfare:				
Bins	MF1 MF11	Anti-Submarine Wariare: ASW1				
	MF3 MF12					

Small Coordina	Small Coordinated Anti-Submarine Warfare Training					
Amphibious Re	ady Group Marine Expeditionary Unit Exe	rcise				
In-Water	Analyzed in individual unit-level training of	events.				
Explosive						
Bins						
Procedural	Acoustic Stressors: (Section 5.3.2)	Physical Disturbance and Strike: (Section 5.3.4)				
Mitigation	Active sonar	Vessel movement				
Measures		Towed in-water devices				
Assumptions	Only the anti-submarine warfare activities were analyzed as Amphibious Ready Group Marine					
Used for	Expeditionary Unit training. Other warfare area training conducted during the exercise was					
Analysis	analyzed as unit-level training.					
	Sonar is not used during every exercise.					
	Stressors to human resources were not a	nalyzed for this activity since it occurs greater than 12 NM				
	from shore.					

A.2.2.5 Group Sail

Small Coordinate	ted Anti-Submarine Warfare						
Group Sail							
Short	Surface ships and helicopter	s integrate to search	Typical Dura	tion			
Description	for, detect, and track threat						
	Sails are not dedicated anti-	submarine warfare	2-3 days				
	exercises and involve multip	le warfare areas.	•				
Long	Multiple ships and helicopte	rs integrate the use of th	eir sensors, in	cluding sonobuoys, to search for,			
Description	detect, classify, localize, and						
				e and involves multiple warfare			
			•	a Group Sail. Other warfare area			
	training conducted during a			_			
	Group Sail is an intermediate		-				
			_	This exercise stresses planning,			
	coordination, and communic		_				
		· · · · · · · · · · · · · · · · · · ·		d attack one submarine. Typically,			
	one ship and helicopter are			·			
	repositioning. Simultaneous Multiple acoustic sources m		actice simulati	ed attacks against the ships.			
Typical			urfaca cambat	canto cubmarinas			
Typical Components	Platforms: Fixed-wing aircraft, rotary-wing aircraft, surface combatants, submarines Targets: Sub-surface targets						
Components	Systems being Trained/Test		huovs acousti	c countermeasures			
Standard	Vessel safety	Typical Locations	buoys, acousti	c countermeasures			
Operating	Aircraft safety	Typical Locations					
Procedures	7 in crare surcey	Range Complexes/Test	ting Ranges:	Inland Waters/Pierside:			
(Section 2.3.3)		Jacksonville		None			
(3333)		Navy Cherry Point					
		Virginia Capes					
Stressors to	Acoustic:	Physical Disturbance a		Energy:			
Biological	Sonar and other	Aircraft and aerial targ		In-air electromagnetic			
Resources	transducers	Vessels and in-water d		devices			
	Aircraft noise	Military expended mat	eriais	Futouslamant			
	Vessel noise	Ingestions		Entanglement: Wires and cables			
	Explosives:	Ingestion:	orials — other				
	None						
Stressors to	Air Quality:	•	ts and Water (Quality:			
Physical	Air Quality: Sediments and Water Quality: Criteria air pollutants Metals Chemicals						
Resources	Circila dii polididitis	Other ma	aterials	Chemicals			
			200.1010				
	Habitats:						
	Physical disturbance and stri	ke – military					
	expended material	·					
Stressors to	None	-		•			
Human							
Resources							

Small Coordina	ted Anti-Subm	arine Warfare			
Group Sail					
Military	Ingestible M	aterial:		Military	Some sub-surface targets
Expended	Small decele	rators/parachu	tes	Recoverable	
Material				Material	
	Non-Ingestil	ole Material:			
		intermeasures,	-		
	(non-explo	osive), sonobuo	y wires,		
	expendabl	e bathythermo	graphs,		
	expendabl	e bathythermo	graph wires,		
	sub-surfac	e targets			
Sonar and	Mid-Freque	ncy:	Anti-Sub	marine Warfare:	High-Frequency:
Other	MF1	MF5	ASW2	ASW4	HF1
Transducer	MF3	MF11	ASW3		
Bins	MF4	MF12			
In-Water	Analyzed in i	ndividual unit-l	evel training e	vents.	
Explosive					
Bins		<u> </u>	5 0 0 l		
Procedural		essors: (Section	5.3.2)	-	I Disturbance and Strike: (Section 5.3.4)
Mitigation	Active sonar			Vessel r	novement
Measures	1441 11 11	· · · · · · · · · · · · · · · · · · ·			
Assumptions	While the preference will be to train against an actual submarine or MK 30 recoverable target,				
Used for	assume only MK 39 expendable targets will be used. One MK 39 Expendable Mobile Anti-Submarine Warfare Training Target may be used in place of an				
Analysis		•		arine wartare Ira	aining rarget may be used in place of an
		bmarine target.		word analyzed or	Crown Sail training Other warfare area
				•	Group Sail training. Other warfare area
	training C	onducted durir	ig tile exercise	was allalyzed as	unit-level training.

A.2.3 AIR WARFARE TRAINING

Air warfare is the primary mission area that addresses combat operations by air and surface forces against hostile aircraft. Navy ships contain an array of modern anti-aircraft weapon systems, including naval guns linked to radar-directed fire-control systems, surface-to-air missile systems, and radar-controlled cannon for close-in point defense. Strike/fighter aircraft carry anti-aircraft weapons, including air-to-air missiles and aircraft cannon. Air warfare training encompasses events and exercises to train ship and aircraft crews in employment of these weapons systems against simulated threat aircraft or targets. Air warfare training includes surface-to-air gunnery, surface-to-air and air-to-air missile exercises, and aircraft force-on-force combat maneuvers.

A.2.3.1 Air Combat Maneuver

Air Warfare						
Air Combat Ma	neuver					
Short	Fixed-wing aircrews aggress	ively maneuver agains	Typica	l Duration		
Description	threat aircraft to gain tactical advantage.			urs		
Long Description	Basic flight maneuvers in which fixed-wing aircrew engage in offensive and defensive maneuvering against each other. During air combat maneuver engagements, no munitions are fired, however countermeasures such as chaff and flares may be used. These maneuvers typically involve two aircraft; however, based upon the training requirement, air combat maneuver exercises may involve over a dozen aircraft.					
Typical Components	Platforms: Fixed-wing aircra Targets: Air targets Systems being Trained/Tes	ted: None				
Standard	Aircraft safety	Typical Locations				
Operating Procedures (Section 2.3.3)		Range Complexes/T Jacksonville Key West Navy Cherry Point Virginia Capes	esting Rar	ges: Inland Wa None	aters/Pierside:	
Stressors to	Acoustic:	Physical Disturbanc	e and Strik	e: Energy	:	
Biological Resources	Aircraft noise	Aircraft and aerial to	argets	In-air e dev	electromagnetic ices	
	Explosives:	Ingestion:				
	None	None		Entang None	glement:	
Stressors to	Air Quality:	Sedim	ents and \	Vater Quality:		
Physical	Criteria air pollutants	None				
Resources	Habitats: None					
Stressors to	Cultural Resources:	Socioeconomic R	esources:		alth and Safety:	
Human	Physical disturbance and	Accessibility		· · · · · · · · · · · · · · · · · · ·	nteractions	
Resources	strike	Airborne acoustion Physical disturba	-	In-air ene ike	rgy	
Military Expended Material	Ingestible Material: None Non-Ingestible Material: None	Militar Recove Materi	rable	None		

Air Warfare	
Air Combat Ma	neuver
Sonar and	None
Other	
Transducer	
Bins	
In-Water	None
Explosive	
Bins	
Procedural	None
Mitigation	
Measures	
Assumptions	No munitions are fired. Flares and chaff may be used. All flares and chaff are accounted for in flare
Used for	exercise and chaff exercise.
Analysis	

A.2.3.2 Air Defense Exercise

Air Warfare						
Air Warrare Air Defense Exercis	Δ					
	-	1 . 1 6	•	T		
Short Description	Aircrew and ship crews of				cal Duration	
Lawa Danadakian	against threat aircraft or					
Long Description	=	d ship personnel perform measures designed to defend against attackin liles or reduce the effectiveness of such attack. This exercise involves full				
					rying altitudes and speeds.	
		•			aircraft controllers on ships, in to track and direct friendly aircraft	
	_				where personnel on ships use	
	search radars to detect, of					
	engagement.	olassily, alla ti	rack errently arrest		somes up to the point of	
Typical	Platforms: Fixed-wing air	craft. surface	combatants			
Components	Targets: Air targets	, ,				
·	Systems being Trained/1	Tested: None				
Standard	Vessel safety	Typical Loca	tions			
Operating	Aircraft safety	Danas Cama	alawaa/Taatina Ba		Inland Mataus / Diausida	
Procedures		Gulf of Mex	plexes/Testing Ra	inges:	Inland Waters/Pierside: None	
(Section 2.3.3)		Jacksonville			None	
		Navy Cherry				
		Virginia Cap				
Stressors to	Acoustic:	•	sturbance and Str	ike:	Energy:	
Biological	Aircraft noise	-	l aerial targets		In-air electromagnetic	
Resources	Vessel noise		in-water devices		devices	
	Explosives:	Ingestion:	Entanglement:			
	None	None			None	
Stressors to	Air Quality:		Sediments and	Water	Quality:	
Physical	Criteria air pollutants		None			
Resources						
	Habitats:					
C+	None	C:		_	Bullis Haalda and Cafetan	
Stressors to Human Resources	Cultural Resources: Physical disturbance and	Accessibi	nomic Resources	:	Public Health and Safety: Physical interactions	
numan resources	strike	Accession	•		In-air energy	
	SUIKC		disturbance and s	trike	iii-aii chergy	
Military	Ingestible Material:	, 5 . 6	Military	None		
Expended	None		Recoverable			
Material	Non-Ingestible Material:		Material			
	None					
Sonar and Other	None	-		-	-	
Transducer Bins						
In-Water	None					
Explosive Bins						
Procedural	Physical Disturbance and	Strike: (Secti	ion 5.3.4)		-	
Mitigation	Vessel movement					
Measures			<u>-</u>			
Assumptions	No munitions are fired.					
Used for Analysis						

A.2.3.3 Gunnery Exercise Air-to-Air Medium-Caliber

Air Warfare					
Gunnery Exercis	se Air-to-Air Medium-Caliber				
Short	Fixed-wing aircrews fire med	dium-caliber gu	ıns at air	Typical	Duration
Description	targets.	8		1-2 hou	
Long		ver aircraft in a	gunnery p		achieve a weapons firing solution
Description	_				r more fixed-wing aircraft and a
	_		-		target banner is recovered after the
	exercise.				
Typical	Platforms: Fixed-wing aircra	aft			
Components	Targets: Air targets				
	Systems being Trained/Test	ted: Medium-ca	aliber gun s	systems	
Standard	Aircraft safety	Typical Locati	ions		
Operating	Weapons firing safety	Range Comp	lovos/Tost	ing Range	es: Inland Waters/Pierside:
Procedures		Jacksonville	iekes/ rest	iiig ivaligi	None
(Section 2.3.3)		Key West			None
		Navy Cherry F	Point		
		Virginia Capes			
Stressors to	Acoustic:	Physical Dist		nd Strike:	: Energy:
Biological	Aircraft noise	Aircraft and a			In-air electromagnetic
Resources	Weapons noise	Military expe	ended mate	erials	devices
	Explosives:	Ingestion:			Entanglement:
	None	Military expe		erials –	None
		munition			
Stressors to	Air Quality:			ts and Wa	ater Quality:
Physical Resources	Criteria air pollutants		Metals		
Resources	Habitats:				
	Physical disturbance and stri	ike – military			
	expended material				
Stressors to	Cultural Resources:	Socioecon	omic Reso	urces:	Public Health and Safety:
Human	Physical disturbance and	Accessibilit	ty		Physical interactions
Resources	strike	Airborne a	coustics		In-air energy
		Physical di	sturbance	and strik	e
Military	Ingestible Material:		Military	To	owed air targets
Expended	Medium-caliber projectiles,		Recoverab	ole	
Material	caliber casings		Material		
	Non-Incostible 84-4				
	Non-Ingestible Material: None				
Sonar and	None				
Other	NOTE				
Transducer					
Bins					
In-Water	None			<u>-</u>	•
Explosive					
Bins					

Air Warfare	Air Warfare				
Gunnery Exerci	se Air-to-Air Medium-Caliber				
Procedural Mitigation Measures	None				
Assumptions Used for Analysis	This activity is conducted at an altitude of 15,000 ft. and above, during the daytime, and approximately 40 NM from shore. A towed air target is a banner target and will be recovered. Only non-explosive munitions used.				

A.2.3.4 Gunnery Exercise Surface-to-Air Large-Caliber

Air Warfare							
	se Surface-to-Air Large-Calibe	r					
-							
Short	Surface ship crews fire large	e-caliber guns at air		ical Duratio	on		
Description	targets. 1-2 hours						
Long	Surface ship crews defend against threat aircraft or missiles with large-caliber guns to disable or						
Description	destroy the threat.						
		•			le that is detected by the ship's		
			jectiles at 1	the threat b	pefore it reaches the ship. The		
	target is towed by a contrac	t air services jet.					
Typical	Platforms: Aircraft carriers,	amphibious warfare	e ships, fixe	ed-wing aird	craft, surface combatants		
Components	Targets: Air targets						
	Systems being Trained/Test	ted: Large-caliber gu	ın systems	;			
Standard	Vessel safety	Typical Locations					
Operating	Aircraft safety	Range Complexes	/Tosting B	langes: I	Inland Waters/Pierside:		
Procedures	Weapons firing safety	Jacksonville	, resuing n	_	None		
(Section				יו	vone		
2.3.3)		Virginia Capes					
Stressors to	Acoustic:	Physical Disturba	nce and St	rike:	Energy:		
Biological	Aircraft noise	Aircraft and aeria	l targets		In-air electromagnetic		
Resources	Vessel noise	Vessels and in-wa	ter device	S	devices		
	Weapons noise	Military expended	d materials	;			
					Entanglement:		
	Explosives:	Ingestion:			None		
	None	Military expended	d material	– other			
		than munition	S				
Stressors to	Air Quality:	Sed	iments an	d Water Qu	ıality:		
Physical	Criteria air pollutants	Met	:als	Other ma	nterials		
Resources							
	Habitats:						
	Physical disturbance and stri	ike – military					
	expended material			-			
Stressors to	None						
Human							
Resources							
Military	Ingestible Material:	Milit	_	None			
Expended	Target fragments	Reco	verable				
Material		Mate	erial				
	Non-Ingestible Material:						
	Large-caliber projectiles, larg	ge-caliber					
	casings						
Sonar and	None						
Other							
Transducer							
Bins		<u> </u>					
In-Water	None						
Explosive							
Bins							

Air Warfare	
Gunnery Exerci	se Surface-to-Air Large-Caliber
Procedural	Acoustic Stressors: (Section 5.3.2)
Mitigation	Weapons firing noise
Measures	
	Physical Disturbance and Strike: (Section 5.3.4)
	Vessel movement
Assumptions	The target is a fiberglass finned target that is towed approximately 3 NM behind the towing aircraft.
Used for	All projectiles are assumed to be non-explosive.
Analysis	Stressors to human resources were not analyzed for this activity since it occurs greater than 12 NM
	from shore.
	Hom shore.

A.2.3.5 Gunnery Exercise Surface-to-Air Medium-Caliber

Air Warfare						
Gunnery Exerci	se Surface-to-Air Medium-Cal	iber				
Short	Surface ship crews fire medi	um-caliber gu	ns at air	Typi	cal Dura	tion
Description	targets.			1-2 hours		
Long	_	gainst threat a	ircraft or m			edium-caliber guns to disable or
Description	destroy the threat.	Samot timeat a	in crare or in		, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	caram camper gans to alsable of
	l	n and a simula	ted threat :	aircraf	t or anti	-ship missile that is detected by
	-					to disable or destroy the threat
	before it reaches the ship. Th	_	-	-	-	-
Typical	Platforms: Aircraft carriers,					-
Components	Targets: Air targets		aa. c cp	o, ou		accounts, inited triing an er are
	Systems being Trained/Test	ed: Medium-d	caliber gun	svster	ns	
Standard	Vessel safety	Typical Loca				
Operating	Aircraft safety					
Procedures	Weapons firing safety	Range Comp	olexes/Test	ing Ra	anges:	Inland Waters/Pierside:
(Section 2.3.3)	311	Jacksonville				None
,		Navy Cherry				
		Virginia Cap				
-		Other AFTT				 .
Stressors to	Acoustic:	Physical Dis			ike:	Energy:
Biological	Aircraft noise	Aircraft and	_			In-air electromagnetic
Resources	Vessel noise	Vessels and				devices
	Weapons noise	Military exp	ended mat	eriais		Entanglament
	Explosives:	Ingestion:				Entanglement: None
	None	_	ended mat	erials :	_	None
	None	Military expended materials – munitions				
		Military expended materials – other				
		than mu				
Stressors to	Air Quality:		Sedimen	ts and	Water (Quality:
Physical	Criteria air pollutants		Metals		er mater	
Resources						
	Habitats:					
	Physical disturbance and stri	ke – military				
	expended material					
Stressors to	None	-				
Human						
Resources						
Military	Ingestible Material:		Military		None	
Expended	Medium-caliber projectiles, medium- Recoverable					
Material	caliber casings, target fra	target fragments Material				
	Non-Ingestible Material:					
	None	<u>-</u>				.
Sonar and	None					
Other						
Transducer						
Bins	Al a care					
In-Water	None					

Air Warfare	
Gunnery Exerci	se Surface-to-Air Medium-Caliber
Explosive Bins	
Procedural Mitigation Measures	Physical Disturbance and Strike: (Section 5.3.4) Vessel movement
Assumptions Used for Analysis	The target is a fiberglass finned target that is towed approximately 3 NM behind the towing aircraft. Stressors to human resources were not analyzed for this activity since it occurs greater than 12 NM from shore.

A.2.3.6 Missile Exercise Air-to-Air

Air Warfare						
Missile Exercise Air-to-Air						
Short Description	Fixed-wing aircrews fir	e air-to-air	Typical Duration			
	missiles at air targets	c an to an	1-2 hours			
Long Description		vo or more fi		a target. Missiles are either		
20.18 2 000.19 110.1			•	s. The target is an unmanned		
	aerial target drone, a tactical air-launched decoy, or a parachute suspended					
	•		• • • • •	are recovered by small boat		
	_			illumination flares are		
	expended and not reco	overed. Thes	e exercises typically o	occur at high altitudes.		
Typical Components	Platforms: Fixed-wing	aircraft, rota	ry-wing aircraft, sma	II boats		
	Targets: Air targets, fla	ares				
	Systems being Trained	d/Tested: Mi	ssile and rocket syste	ems		
Standard Operating	Vessel safety		Typical Locations			
Procedures	Aircraft safety		Range	Inland Waters/Pierside:		
(Section 2.3.3)	Weapons firing safety		Complexes/Testing	_		
			Ranges:	g None		
			Jacksonville			
			Key West			
			Navy Cherry Point			
			Virginia Capes			
Stressors to Biological	Acoustic:	Physical Dis	sturbance and Strike:	Energy:		
Resources	Aircraft noise	=	l aerial targets	In-air electromagnetic		
	Vessel noise	Military exp	ended materials	devices		
	Weapons noise	In-air explo	sives			
				Entanglement:		
	Explosives:	Ingestion:	Decelerators/parachut			
	In-air explosives		ended materials –	S		
		munitio	-			
			ended materials –			
S:	A: 0 !!!	otner th	an munitions			
Stressors to Physical Resources	Air Quality:		Sediments and Water Quality: Explosives Chemicals			
	Criteria air pollutants		Explosives	Chemicais		
	Habitats:		Metals			
	Physical disturbance ar	nd strike -				
	military expended i					
Stressors to Human Resources	None		-	-		
Military Expended Material	Ingestible Material:		Military	Recoverable drones		
, ·	Missiles (explosive) and	d target	Recoverable			
	fragments		Material			
	Non-Ingestible Materi					
	Parachutes-large, illum					
	flares, missiles (nor	n-explosive)				
Sonar and Other Transducer	None					
Bins						
In-Water Explosive Bins	None					

Air Warfare	
Missile Exercise Air-to-Air	
Procedural Mitigation	None
Measures	
Assumptions Used for Analysis	For analysis, all missiles are assumed to be explosive, although non-explosive practice munitions may be used. All missiles explode at high altitude. All propellant and explosives are consumed. Stressors to human resources were not analyzed for this activity since it occurs greater than 12 NM from shore.



Figure A.2-1: BQM-74 (Aerial Target)



Figure A.2-2: LUU-2B/B Illuminating Flare (Aerial Target)



Figure A.2-3: Tactical Air-Launched Decoy (Aerial Target)

A.2.3.7 Missile Exercise – Man-Portable Air Defense System

Air Warfare							
	– Man-Portable Air Defense	System					
Short	Personnel employ a shoulde	er fired surface	e to air	Typical D	uration		
Description	missile at air targets.			Varies			
Long		ersonnel employ the Man-Portable Air Defense S			ulder fired surfa	ace to air	
Description	missile, against threat missile						
2000.150.011	An exercise involves personr		Man-Portable	a Air Dafar	nsa Systam at r	emote niloted or	
	ballistic aerial targets. Activi	_			-	-	
	targets over the water. Smal			-	_	in shore locations at	
Typical	Platforms: Small boats	i boats are as	ca to crisure	. range sar	cty.		
Components	Targets: Air targets						
Components	Systems being Trained/Test	t od: Man-Port	ahla Dafans	a Sustams			
Ctondovd				e systems			
Standard	Vessel safety	Typical Loca	itions				
Operating	Weapons firing safety	Range Com	plexes/Test	ing Ranges	: Inland Wa	aters/Pierside:	
Procedures	Unmanned aerial, surface	Navy Cherry	-		None		
(Section 2.3.3)	and subsurface vehicle	, ,					
_	safety	<u> </u>					
Stressors to	Acoustic:		sturbance a		Energy	:	
Biological	Aircraft noise		l aerial targe		None		
Resources	Weapons noise		l in-water de				
			pended mate	erials	_	lement:	
	Explosives:	In-air explo	sives		None		
	In-air explosives						
		Ingestion:					
			pended mate	erial –			
		munitio	_				
			pended mate	erial – othe	er		
		than mu	_		-		
Stressors to	Air Quality:				er Quality:		
Physical	Criteria air pollutants		Explosive	s Ch	nemicals		
Resources	•		Metals				
	Habitats:						
	Physical disturbance and stri	ke – military					
	expended material						
Stressors to	Cultural Resources:		nomic Reso	urces:		alth and Safety:	
Human	Physical disturbance and	Accessibi	-		Physical ir	nteractions	
Resources	strike		acoustics				
		Physical o	disturbance	and strike			
Military	Ingestible Material:		Military	No	ne		
Expended	Target and missile (explosive	e) fragments	Recoverab	ole			
Material			Material				
	Non-Ingestible Material:						
	None						
Sonar and	None						
Other							
Transducer							
Bins							
In-Water	None						

Air Warfare	Air Warfare					
Missile Exercise	e – Man-Portable Air Defense System					
Bins						
Procedural	Physical Disturbance and Strike: (Section 5.3.4)					
Mitigation	Non-explosive missiles and rockets					
Measures						
Assumptions	For analysis, all missiles are assumed to be explosive, although non-explosive practice munitions					
Used for	may be used. All missiles explode in-air at low altitude.					
Analysis	All propellant and explosives are consumed.					

A.2.3.8 Missile Exercise Surface-to-Air

Air Warfare									
Missile Exercise	Surface-to-Air								
Short	Surface ship crews fire surfa	co-to-air miss	ilos at air	Tynic	al Duration				
Description	targets.	ice-to-aii iiiiss	iles at all	1-2 hours					
Long									
Description	•	urface ship crews defend against threat missiles and aircraft with ship launched surface-to-air							
	missiles.	e involves a simulated threat aircraft or anti-ship missile which is detected by the ship's							
	The exercise involves a simu								
				_	xplosive) to disable or destroy the threa				
		ote controlled	drone. Surf	ace-to	-air missiles may also be used to train				
	against land attack missiles.								
Typical	Platforms: Aircraft carriers,	amphibious w	arfare ships	s, surfa	ace combatants				
Components	Targets: Air targets								
	Systems being Trained/Test			syster	ms				
Standard	Vessel safety	Typical Loca	tions						
Operating Procedures	Aircraft safety Weapons firing safety	Range Com	plexes/Test	ing Ra	nges: Inland Waters/Pierside:				
(Section 2.3.3)	weapons ming salety	Gulf of Mexi	со		None				
(3000.011 2.3.3)		Jacksonville							
	1	Navy Cherry Point							
		Northeast							
		Virginia Cap							
Stressors to	Acoustic: Aircraft noise	Physical Dis							
Biological Resources	Vessel noise	Aircraft and Vessel and i	_		In-air electromagnetic devices				
Resources	Weapons noise	Military exp			devices				
		In-air explos		criais	Entanglement:				
	Explosives:	a exp.o.			Decelerators/parachutes				
	In-air explosives	Ingestion:							
		Military exp	ended mate	erial –					
		munitio	_						
		Military exp		erial –	other				
_		than mu	-						
Stressors to	Air Quality:				Water Quality:				
Physical	Criteria air pollutants		Explosive	S	Chemicals				
Resources	Habitats:		Metals						
	Physical disturbance and stri	ke – militarv							
	expended material								
Stressors to	None								
Human									
Resources									
Military	Ingestible Material:	<u> </u>	Military		Recoverable drones				
Expended Material	Target and missile (explosive	e) fragments	Recoveral Material	ole					
	Non-Ingestible Material:								
	None								

Air Warfare	
Missile Exercise	Surface-to-Air
Sonar and	None
Other	
Transducer	
Bins	
Explosive	None
Bins	
Procedural	Physical Disturbance and Strike: (Section 5.3.4)
Mitigation	Vessel movement
Measures	
Assumptions	Assumes that all surface-to-air missiles are high-explosive. Missile explodes well above the
Used for	water's surface. All explosive and propellant are consumed.
Analysis	Stressors to human resources were not analyzed for this activity since it occurs greater than 12 NM
	from shore.

A.2.4 AMPHIBIOUS WARFARE TRAINING

Amphibious warfare is a type of naval warfare involving the utilization of naval firepower, logistics, and Marine Corps landing forces to project military power ashore. Amphibious warfare encompasses a broad spectrum of activities involving maneuver from the sea to objectives ashore, ranging from reconnaissance or raid missions involving a small unit to large-scale amphibious operations involving over 1,000 Marines and Sailors and multiple ships and aircraft embarked in a strike group.

Amphibious warfare training includes tasks at increasing levels of complexity, from individual, crew, and small unit events to large task force exercises. Individual and crew training include the operation of amphibious vehicles and naval gunfire support training. Small-unit training activities include shore assaults, boat raids, airfield or port seizures, and reconnaissance. Larger-scale amphibious exercises involve ship-to-shore maneuver, shore bombardment and other naval fire support, and air strike and close air support training.

A.2.4.1 Amphibious Assault

Amphibious Wa	arfare						
Amphibious As	sault						
Short Description		ge unit forces move ashore from amphibious os at sea for the immediate execution of inland		ks			
Long Description	Large unit forces move asho inland objectives. Amphibio	ore from amphibious ships at sea for the immediate execution of us assault is conducted for the purposes of prosecuting further an advanced naval or airbase, or denying the enemy use of					
	Unit-level training exercises involve one or more amphibious ships, and their associated watercraft and aircraft, to move personnel and equipment from ship to shore without the command and control and supporting elements involved in a full scale exercise. The goal is to practice loading, unloading, and movement and to develop the timing required for a full-scale exercise.						
Typical Components	Platforms: Amphibious war aircraft Targets: None Systems being Trained/Tes		raft, rotary-wi	ing aircraft, small boats, tiltrotor			
Standard	Vessel safety	Typical Locations					
Operating Procedures (Section 2.3.3)	Aircraft safety	Range Complexes/Test	ing Ranges:	Inland Waters/Pierside: None			
Stressors to Biological Resources	Acoustic: Aircraft noise Vessel noise	Physical Disturbance a Aircraft and aerial targ Vessels and in-water d	ets	Energy: In-air electromagnetic devices			
	Explosives: None	Ingestion: Entanglement: None None					
Stressors to Physical Resources	Air Quality: Criteria air pollutants Habitats: None	Sedimen None	ts and Water	Quality:			
Stressors to Human	Cultural Resources: Physical disturbance and	Socioeconomic Reso Accessibility	ources:	Public Health and Safety: Physical interactions			

Amphibious Wa	Amphibious Warfare							
Amphibious Ass	Amphibious Assault							
Resources	strike Airbor	ne acoustics	In-air energy					
	Physic	al disturbance and s	trike					
Military	Ingestible Material:	Military	None					
Expended	None	Recoverable						
Material		Material						
	Non-Ingestible Material:							
	None							
Sonar and	None							
Other								
Transducer								
Bins								
In-Water	None							
Explosive								
Bins								
Procedural	Physical Disturbance and Strike: (Section 5.3.4)							
Mitigation	Vessel movement							
Measures								
Assumptions	Typical exercise: 1-3 amphibious ships	e.g., LHA or LHD, LP	D, LSD); 2-8 landing craft (landing					
Used for	craft, air cushion; landing craft, utility);	-						
Analysis	MH-53, H-46/MV-22, AH-1, UH-1, AV-8	•						

A.2.4.2 Amphibious Marine Expeditionary Unit Integration Exercise

Amphibious Warfar						
	Expeditionary Unit Inter					
Short Description	Navy and Marine Corps		_	Typical Dur	ation	
	integration training at s deployment.			Up to 3 weeks		
Long Description		•	•	-	or the first time at sea to practice	
	-			-	larine Corps forces conduct basic	
	The state of the s			s; visit, boai	rd, search, and seizure training;	
Tour Second	helicopter and mechani			-:C+	and the sign of the same II have be	
Typical Components	tiltrotor aircraft	warrare snips	s, fixed-wing	aircraft, rot	ary-wing aircraft, small boats,	
Components	Targets: None					
	Systems being Trained,	/Tested: None	P			
Standard	Vessel safety	Typical Loca				
Operating	Aircraft safety					
Procedures		_	plexes/Test		Inland Waters/Pierside:	
(Section 2.3.3)		Navy Cherry	y Point (Ons	iow Bay)	None	
Stressors to	Acoustic:	•	sturbance a		Energy:	
Biological	Aircraft noise		l aerial targe		In-air electromagnetic	
Resources	Vessel noise	Vessels and	in-water de	evices	devices	
	Explosives:	Ingestion:			Entanglement:	
	None	None			None	
	None	None			None	
Stressors to	Air Quality:	-	Sediment	s and Wate	r Quality:	
Physical	Criteria air pollutants		None			
Resources						
	Habitats:					
	None		-			
Stressors to	Cultural Resources:		nomic Reso	urces:	Public Health and Safety:	
Human Resources	Physical disturbance and		•		Physical interactions	
	strike		acoustics disturbance	and strike	In-air energy	
Military	Ingestible Material:	Filysical C	Military	None	<u>,</u>	
Expended	None		Recoverab			
Material			Material			
	Non-Ingestible Materia	l:				
	None					
Sonar and Other	None					
Transducer Bins	_					
In-Water	None					
Explosive Bins				-	<u>-</u>	
Procedural	Physical Disturbance ar	nd Strike: (Sec	tion 5.3.4)			
Mitigation	Vessel movement					
Measures			1	1 1 1		
Assumptions					otions of appropriate unit-level	
Used for Analysis	exercises (e.g., surrace-	lo-surrace and	a air-to-surfa	ace smaii-ca	liber gunnery exercises).	

A.2.4.3 Amphibious Raid

Amphibious Wa	arfaro					
Amphibious Ra						
-		1 .1 .			1.5	
Short Description	Small unit forces move from sea for a specific short-term	n mission. These are			Typical Duration	
	quick operations with as few possible.	•		4-8 ho		
Long Description	Small unit forces swiftly move from amphibious vessels at sea into hostile territory for a specific mission, including a planned withdrawal. Raids are conducted to inflict loss or damage, secure information, create a diversion, confuse the enemy, or capture or evacuate individuals or material. Amphibious raid forces are kept as small as possible to maximize stealth and speed of the operation.					
	An event may employ assaul live-fire operations. Surveilla used during this exercise.	•				
	Exercises are also conducted or areas requiring assistance			f humai	nitarian assistance to re	emote locations
Typical	Platforms: Amphibious warf	fare ships, sm	all boats, un	manne	d aerial systems	
Components	Targets: None Systems being Trained/Test	t ed: None				
Standard	Vessel safety	Typical Loca	tions			
Operating	Aircraft safety				<u>.</u>	
Procedures	Unmanned aerial, surface,	Range Com	-	ing Ran	ges: Inland Waters	/Pierside:
(Section 2.3.3)	and subsurface vehicle	Jacksonville			None	
	safety	Navy Cherry	/ Point			
Stressors to	Acoustic:	Physical Dis	turbance a	nd Strik	e: Energy:	
Biological	Aircraft noise	Aircraft and			In-air electr	omagnetic
Resources	Vessel noise	Vessels and	in-water de	evices	devices	_
	Explosives:	Ingestion:			Entangleme	ent:
	None	None			None	
Stressors to	Air Quality:		Sediment	ts and V	Vater Quality:	
Physical	Criteria air pollutants		None			
Resources						
	Habitats:					
Characteristic	None	C:			Dodalia II.a alah a	I Cft
Stressors to Human	Cultural Resources:		nomic Reso	urces:	Public Health a	-
Resources	Physical disturbance and strike	Accessibi	acoustics		Physical intera In-air energy	CUUIIS
Resources	JUINE		disturbance	and stri		
Military	Ingestible Material:	1	Military		None	
Expended	None		Recoveral		- -	
Material			Material			
	Non-Ingestible Material:					
	None					

Amphibious Wa	Amphibious Warfare					
Amphibious Ra	id					
Sonar and Other Transducer Bins	None					
In-Water Explosive Bins	None					
Procedural Mitigation Measures	Physical Disturbance and Strike: (Section 5.3.4) Vessel movement					
Assumptions Used for Analysis	Weapons firing during this exercise is discussed in appropriate unit-level training descriptions (e.g., surface-to-surface and air-to-surface small-caliber gunnery exercises).					

A.2.4.4 Amphibious Vehicle Maneuvers

Amphibious Warfare								
Amphibious Vehicle Ma	neuvers							
Short Description	Small boat crews p			Typic	cal Duration			
	employment of amphibious vehicles.			1-4 hours				
Long Description	Navy personnel train to learn handling characteristics of a variety of amphibious craft, to							
		include Landing Craft Air Cushion vehicles, amphibious assault vehicles, and Lighter						
		Amphibious Resupply Cargo vehicles. Training includes the driving of vehicles into the water, basic in-water vehicle maneuvers, and the driving of vehicles back to shore.						
Torrigal Comments					driving of vehicles back to shore.			
Typical Components	Platforms: Amphib Targets: None	ious venicies,	smail boats	Ó				
	Systems being Train	ined/Tested:	None					
Standard Operating	Vessel safety	Typical Loca						
Procedures				_				
(Section 2.3.3)		Range Com	plexes/Test	ing	Inland Waters/Pierside:			
		Ranges:			Lower Chesapeake Bay			
		Virginia Cap Jacksonville			Joint Expeditionary Base Little Creek beaches and harbor			
		Jacksonvine			Joint Expeditionary Base Fort Story			
					Dam Neck Annex			
					Camp Pendleton			
					St. Johns River (Blount Island)			
Stressors to Biological	Acoustic:	Physical Dis	turbance a	nd Str	ike: Energy:			
Resources	Vessel noise	Vessels and	in-water de	evices	None			
	Explosives:	Ingestion:			Entanglement:			
Chusana na ta Dhuaisal	None	None	Cadinaan	4	None			
Stressors to Physical Resources	Air Quality: Criteria air pollutan	tc.	None	ts and	Water Quality:			
Resources	Criteria ali poliutari	t3	None					
	Habitats:							
	None							
Stressors to Human	Cultural Resources	: Socioeco	nomic		Public Health and Safety:			
Resources	Physical disturbanc				Physical interactions			
	and strike	Accessibi	-					
		Pnysical c strike	disturbance	and				
Military Expended	Ingestible Materia		Military		None			
Material	None	•	Recovera	hle	None			
Waterial	None		Material	JIC				
	Non-Ingestible Ma	terial:						
	None							
Sonar and Other	None	-						
Transducer Bins		<u> </u>			<u> </u>			
In-Water Explosive	None							
Bins								
Procedural Mitigation	Physical Disturband	ce and Strike:	(Section 5.3	3.4)				
Measures	Vessel movement							
Assumptions Used for	None							
Analysis								

A.2.4.5 Humanitarian Assistance Operations

Amphibious Warfare	Americana Marfara					
Humanitarian Assistar	nce Operations					
	<u> </u>	to noncombat	ants	Tunical	Duration	
Short Description	Military units evacuate from hostile or unsafe			Турісаі	Duration	
	humanitarian assistar	-		12 hour		
	disaster.	ice iii tiiiles oi	'	12 11001	5	
Long Description		e noncombatants from hostile or unsafe areas to safe havens or to				
Long Description						
		n assistance in times of disaster. Non-Combatant Evacuation Operation is y units (generally Marine Corps) usually operating in conjunction with				
	Navy ships and aircra		•			•
	war, civil unrest, or n					
	evacuations in hostile			•	•	•
	opposition to evacua		-			-
	expected to participa		-			
Typical Components	Platforms: Amphibio					raft, small boats
	Targets: None					·
	Systems being Traine	ed/Tested: No	ne			
Standard Operating	Vessel safety	Typical Loca	tions			
Procedures	Aircraft safety	Dangs Com	nlavas/Tasti	na Dana	oo. Inland M	latara /Diaraida.
(Section 2.3.3)		Navy Cherry	plexes/Testi	ng Kang	es: Iniand w None	aters/Pierside:
Stressors to	Acoustic:			d Ctrika		·•
Biological Resources	Acoustic: Aircraft noise	-	s turbance an I aerial target			y: electromagnetic
biological Resources	Vessel noise		in-water de			rices
	Vessel Holse	vessels alla	iii-watei ue	vices	uev	rices
	Explosives:	Ingestion:			Entan	glement:
	None	None			None	5
Stressors to Physical	Air Quality:		Sediments	and W	ater Quality:	
Resources	Criteria air pollutants		None		,	
	·					
	Habitats:					
	None					
Stressors to Human	Cultural Resources:	Socioeco	nomic Resoເ	ırces:	Public He	ealth and Safety:
Resources	Physical disturbance	Accessibi	lity		Physical i	nteractions
	and strike		acoustics		In-air ene	ergy
		Physical c	disturbance a	nd strik	e	
Military Expended	Ingestible Material:		Military		one	
Material	None		Recoverab	le		
	Non-Ingestible Mate	rial:	Material			
	None	<u>-</u>			<u>-</u>	
Sonar and Other	None					
Transducer Bins	-			-	<u>-</u>	·
In-Water Explosive	None					
Bins				_		•
Procedural	Physical Disturbance and Strike: (Section					
Mitigation	5.3.4)					
Measures	Vessel movement					
Assumptions Used	None					
for Analysis						

A.2.4.6 Marine Expeditionary Unit Certification Exercise

Amphibious Wa	Amphibious Warfare					
Marine Expedit	ionary Unit Certification Exer	cise				
Short	Amphibious Ready Group ex	rercises are conducted	Typical Duration			
Description	to validate the Marine Expe	ditionary Unit's				
	readiness for deployment ar	nd include small boat				
	raids; visit, board, search, and seizure training; Up to 3 weeks					
	T	nechanized amphibious raids; and				
	non-combatant evacuation of					
Long Description		us forces move from amphibious ships at sea, by watercraft or aircraft, and e, establish a beachhead, and occupy the area or move further inland for				
	The amphibious assault conducted by a Marine Expeditionary Unit involves employment of the advance force, combat, combat support, and combat service support units in close coordination with the expeditionary strike group and carrier strike group. The landing is conducted in waves and is focused on concentrating forces quickly in order to establish the beachhead. A typical exercise involves two reinforced companies from the battalion landing team coming ashore via landing crafts and amphibious assault vehicles. Follow-on waves include fire support assets, armored units, and service support elements.					
Typical	Platforms: Amphibious warf	are ships, fixed-wing aird	raft, rotary-wing aircraf	t, small boats, tiltrotor		
Components	aircraft					
	Targets: None					
	Systems being Trained/Test	ed: None				
Standard	Vessel safety	Typical Locations				
Operating	Aircraft safety	Range Complexes/Testing Ranges: Inland Waters/Pierside:				
Procedures		Navy Cherry Point	None	waters, ricisiae.		
(Section 2.3.3)			10. "			
Stressors to	Acoustic: Aircraft noise	Physical Disturbance a				
Biological Resources	Vessel noise	Aircraft and aerial targ Vessels and in-water d		ir electromagnetic devices		
Resources	vessei iloise	vessels allu III-watel u	evices	devices		
	Explosives:	Ingestion:	Enta	inglement:		
	None	None	Non	-		
Stressors to	Air Quality:	Sedimer	t and Water Quality:			
Physical	Criteria air pollutants	None	-			
Resources						
	Habitats:					
	None					
Stressors to	Cultural Resources:			Health and Safety:		
Human	Physical disturbance and	Accessibility		l interactions		
Resources	strike	Airborne acoustics Physical disturbance	In-air e	nergy		
Military	Ingestible Material:	Military	None			
Expended	None	Recovera				
Material	NOTE	Material				
···accilai	Non-Ingestible Material:	Widterlai				
	None					

Amphibious Wa	arfare
Marine Expedit	ionary Unit Certification Exercise
Sonar and Other Transducer Bins	None
In-Water Explosive Bins	None
Procedural Mitigation Measures	Physical Disturbance and Strike: (Section 5.3.4) Vessel movement
Assumptions Used for Analysis	Weapons firing during this exercise is discussed in appropriate unit-level exercise descriptions (e.g., surface-to-surface and air-to-surface small-caliber gunnery exercises).

A.2.4.7 Naval Surface Fire Support Exercise – At Sea

Amphibious Wa	arfare					
Naval Surface Fire Support Exercise – At Sea						
Short	Surface ship crews fire large	-caliber guns a	at a	Typica	al Duration	
Description	passive acoustic hydrophone	e scoring syste	em.	1-2 hours of firing, 8 hours total		
Long	Surface ship crews use large	-caliber guns t	o support for	rces a	ashore; however, the land target	is
Description	simulated at sea. Rounds are scored by passive acoustic buoys located at or near the target area.					
	The portable scoring system is composed of buoys (Integrated Maritime Portable Acoustic Scoring					
					cific intervals, which are retrieved	
	the exercise. A scoring syste	m provides a r	ealistic prese	entatio	ion, such as a land mass with	
		-			target area overlays the hydroph	
	■		_		the acoustic noise resulting from	
	_				hydrophones. The scoring system	
	_			_	g the exercise to be conducted as is use large-caliber (main battery)	
	support forces ashore.	ai iaiia taiget.	Juliace ship	CICVV	s use large-camper (main pattery)	guiis to
Typical	Platforms: Surface combata	nts				
Components	Targets: Surface targets	-				
·	Systems being Trained/Test	ted: Large-cali	ber gun syste	ems		
Standard	Vessel safety	Typical Loca	tions			
Operating	Weapons firing safety	Range Comi	plexes/Testin	ng Rar	nges: Inland Waters/Pierside	:
Procedures		Jacksonville		0	None	
(Section 2.3.3)		Navy Cherry	Point			
		Virginia Cap				
Stressors to	Acoustic:	-	turbance and			
Biological Resources	Vessel noise		in-water dev		In-air electromagnet devices	IC
Resources	Weapons noise Explosives:	willitary exp	ended mater	iais	devices	
	None	Ingestion:			Entanglement:	
		None			None	
Stressors to	Air Quality:	•	Sediments	and \	Water Quality:	
Physical	Criteria air pollutants		Metals		Other materials	
Resources						
	Habitats:	iko militaru				
	Physical disturbance and stri expended material	ike – Illilital y				
Stressors to	None					
Human	110110					
Resources						
Military	Ingestible Material:	=	Military		None	
Expended	None		Recoverabl	e		
Material			Material			
	Non-Ingestible Material: Large-caliber projectiles, large	ge-caliher				
	casings	Pr-calinei				
Sonar and	None					
Other						
Transducer						
Bins						

Amphibious Wa	Amphibious Warfare					
Naval Surface F	Naval Surface Fire Support Exercise – At Sea					
In-Water Explosive Bins	None					
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3.2) Weapons firing noise					
	Physical Disturbance and Strike: (Section 5.3.4) Vessel movement Small-, medium-, and large-caliber non-explosive practice munitions					
Assumptions Used for Analysis	Stressors to human resources were not analyzed for this activity since it occurs greater than 12 NM from shore.					

A.2.4.8 Naval Surface Fire Support Exercise – Land-Based Target

Amphibious Wa	arfare					
	ire Support Exercise – Land-B	ased Target				
Short			t land T	mical Dura	tion	
Description	Surface ship crews fire large based targets in support of the	_		vpical Dura 2 hours	idon-	
Long	Surface ship crews use large					
Description		•	• •			
		or more ships position themselves from three to six NM from the target area and a land-based ter relays type and exact location of the target. After observing the fall of the shot, the spotter				
	relays any adjustments need requests a sufficient number	ded to reach the target. Once the rounds are on target, the spotter				
	-	•	-	_		
	This exercise occurs on land	-	•	•	•	
		oorted by targe	et shapes such	as tanks, ti	rucks, trains, or aircraft on the	
	ground.					
Typical	Platforms: Surface combata	nts				
Components	Targets: Land targets	and Lower activ				
Chanda	Systems being Trained/Test			15		
Standard Operating	Vessel safety Weapons firing safety	Typical Locat	tions			
Procedures	weapons ming salety	Range Comp	olexes/Testing	Ranges:	Inland Waters/Pierside:	
(Section 2.3.3)		Navy Cherry	Point		None	
Stressors to	Acoustic:	Physical Dis	turbance and	Strike:	Energy:	
Biological	Vessel noise	-	in-water device		In-air electromagnetic	
Resources	Weapons noise				devices	
		Ingestion:				
	Explosives:	None			Entanglement:	
	None				None	
Stressors to	Air Quality:		Sediments a	nd Water (Quality:	
Physical	Criteria air pollutants		Metals			
Resources	Habitats:					
	None					
Stressors to	Cultural Resources:	Socioaco	nomic Resourc		Public Health and Safety:	
Human	Physical disturbance and	Accessibil		.c.s.	Physical interactions	
Resources	strike	Airborne	•		In-air energy	
			isturbance and	d strike	<i>.</i> ,	
Military	Ingestible Material:	,	Military	None		
Expended	None		Recoverable			
Material			Material			
	Non-Ingestible Material:					
	Large-caliber projectiles (cas	sings only)				
Sonar and	None					
Other						
Transducer Bins						
In-Water	None					
Explosive	HOLL					
Bins						

Amphibious Wa	Amphibious Warfare					
Naval Surface F	ire Support Exercise – Land-Based Target					
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3.2) Weapons firing noise Physical Disturbance and Strike: (Section 5.3.4) Vessel movement					
Assumptions Used for Analysis	Projectile impact is on land and is not further analyzed. No land based impacts are included in this document. Firing point from sea is Area 15B. Impact occurs at G-10 Impact Area, Camp Lejeune.					

A.2.5 ANTI-SUBMARINE WARFARE TRAINING

Anti-submarine warfare involves helicopter and maritime patrol aircraft, ships, and submarines. These units operate alone or in combination to locate, track, and neutralize submarines. Controlling the undersea battlespace is a unique naval capability and a vital aspect of sea control. Undersea battlespace dominance requires proficiency in anti-submarine warfare. Every deploying strike group and individual surface combatant must possess this capability.

Various types of active and passive sonar are used by the Navy to determine water depth, and identify, track, and target submarines. Passive sonar "listens" for sound waves by using underwater microphones, called hydrophones, which receive, amplify, and process underwater sounds. No sound is introduced into the water when using passive sonar. Passive sonar can indicate the presence, character, and movement of submarines. However, passive sonar provides only a bearing (direction) to a sound-emitting source; it does not provide an accurate range (distance) to the source. Active sonar is needed to locate objects because active sonar provides both bearing and range to the detected contact (such as an enemy submarine).

The Navy's anti-submarine warfare training plan, including the use of active sonar in at-sea training scenarios, includes multiple levels of training. Individual-level anti-submarine warfare training addresses basic skills such as detection and classification of contacts; distinguishing discrete acoustic signatures including those of ships, submarines, and marine life; and identifying the characteristics, functions, and effects of controlled jamming and evasion devices.

More advanced, integrated anti-submarine warfare training exercises involving active sonar are conducted in coordinated, at-sea operations during training exercises involving submarines, ships, aircraft, and helicopters. This training integrates the full anti-submarine warfare continuum, from detecting and tracking a submarine to attacking a target using either exercise torpedoes or simulated weapons. Training events include detection and tracking exercises against "enemy" submarine contacts, torpedo employment exercises against the target, and exercising command and control tasks in a multi-dimensional battlespace.

A.2.5.1 Torpedo Exercise – Helicopter

Anti-Submarine	· Warfare						
	Anti-Submarine Warfare Torpedo Exercise - Helicopter						
Short	Helicopter crews search for,	track, and detect	Typical Dura	tion			
Description	submarines. Recoverable air launched torpedoes are employed against submarine targets.		2-5 hours				
Long Description	Helicopters using sonobuoys and dipping sonar search for, detect, classify, localize, and track a simulated threat submarine with the goal of determining a firing solution that could be used to launch a torpedo and destroy the submarine. Sonobuoys (both passive and active) are typically employed by a helicopter operating at altitudes below 3,000 ft. Dipping sonar (both passive and active) is employed from an altitude of about 50 ft. after the search area has been narrowed based on the sonobuoy search. The anti-submarine warfare target used for this exercise may be a MK-39 Expendable Mobile Anti-Submarine Warfare Training Target, a MK-30 target, or a live submarine. This exercise may involve a single aircraft, or occur during a coordinated larger exercise involving multiple aircraft and ships, including a major range event. Unmanned aerial systems, such as the MQ-8 Fire Scout, may also be used. The exercise torpedo is recovered by a special recovery helicopter or small craft. The preferred range for this exercise is an instrumented underwater range, but it may be conducted in other range complexes depending on training requirements and available assets.						
Typical Components	Platforms: Rotary-wing airco Targets: Sub-surface targets Systems being Trained/Tes	t ed: Sonar systems, sono					
Standard	Vessel safety	Typical Locations					
Operating Procedures (Section 2.3.3)	Aircraft safety Unmanned aerial, surface, and subsurface vehicle safety	Range Complexes/Tes Jacksonville Virginia Capes	ting Ranges:	Inland Waters/Pierside: None			
Stressors to	Acoustic:	Physical Disturbance a	ınd Strike:	Energy:			
Biological	Sonar and other	Aircraft and aerial targ		In-air electromagnetic			
Resources	transducers	Vessels and in-water d		devices			
	Aircraft noise	Military expended mat	erials				
	Vessel noise			Entanglement:			
	Funlaciuses	Ingestion:	تعطف ملمنست	Wires and cables			
	Explosives: None	Military expended mat than munitions	eriais – otner	Decelerators/parachutes			
Stressors to	Air Quality:		ts and Water (Quality:			
Physical	Criteria air pollutants	Metals		emicals			
Resources	2 politicarità	Other ma					
	Habitats:	2 33					
	Physical disturbance and stri expended material	ke – military					
Stressors to	None						
Human							
Resources							

Anti-Submarine	Anti-Submarine Warfare						
Anti-Submarine	Anti-Submarine Warfare Torpedo Exercise - Helicopter						
Military Expended	Ingestible Material: Small decelerators/parachutes,	Military Recoverable	Recoverable sub-surface targets, lightweight torpedoes (non-				
Material	parachutes-medium	Material	explosive)				
	Non-Ingestible Material: Lightweight torpedo accessories, sonobuoys (non-explosive), sonobuoy wires						
Sonar and Other Transducer Bins	Mid-Frequency: Torpedo MF4 MF5 TORP1	es:					
In-Water Explosive Bins	None						
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3.2) Physical Disturbance and Strike: (Section 5.3.4) Active sonar Vessel movement						
Assumptions Used for Analysis	Stressors to human resources were not an from shore.	alyzed for this ac	tivity since it occurs greater than 12 NM				

A.2.5.2 Torpedo Exercise – Maritime Patrol Aircraft

Anti-Submarine	Anti-Submarine Warfare						
Anti-Submarine	Anti-Submarine Warfare Torpedo Exercise – Maritime Patrol Aircraft						
Short	Maritime patrol aircraft crev	ws search for, track,	Typical Dura	tion			
Description	and detect submarines. Reco torpedoes are employed ago targets.		2-8 hours				
Long	Fixed-wing maritime patrol aircraft employ sonobuoys to search for, detect, classify, localize, and						
Description	track a simulated threat submarine with the goal of determining a firing solution that could be used to launch a torpedo and destroy the submarine.						
Typical Components	Sonobuoys (both passive and active) are typically employed by a maritime patrol aircraft operating at altitudes below 3,000 ft. Both sonobuoys and torpedoes (using the High Altitude Anti-Submarine Warfare Weapon Capability kit) may be delivered at high altitudes to remain clear of high threat areas. Sonobuoys are deployed in specific patterns based on the expected threat submarine and specific water conditions. Depending on these two factors, these patterns will cover many different size areas. For certain sonobuoys, tactical parameters of use may be classified. The anti-submarine warfare target used for this exercise may be a MK-39 Expendable Mobile Anti-Submarine Warfare Training Target, a MK-30 target, or a live submarine. This exercise may involve a single aircraft, or be undertaken in the context of a coordinated larger exercise involving multiple aircraft and vessels, including a major range event. The exercise torpedo is recovered by helicopter or small craft. The preferred range for this exercise is an instrumented underwater range, but it may be conducted in other OPAREAs depending on training requirements and available assets. Platforms: Fixed-wing aircraft Targets: Sub-surface targets						
Standard	Systems being Trained/Tested: Sonobuoys, torpedoes Aircraft safety Typical Locations						
Operating	Andrait Surcty						
Procedures		Range Complexes/Test	ing Ranges:	Inland Waters/Pierside:			
(Section 2.3.3)		Jacksonville Virginia Capes		None			
Stressors to	Acoustic:	Physical Disturbance a	nd Strike:	Energy:			
Biological	Sonar and other	Aircraft and aerial targe		In-air electromagnetic			
Resources	transducers	Military expended mat		devices			
	Aircraft noise	, ,					
		Ingestion:		Entanglement:			
	Explosives:	Military expended mat	erials – other	Wires and cables			
	None	than munitions		Decelerators/parachutes			
Stressors to	Air Quality: Sediments and Water Quality:						
Physical	Criteria air pollutants Metals Chemicals						
Resources		Other ma	nterials				
	Habitats:						
	Physical disturbance and stri	ke – military					
	expended material						
Stressors to	None						
Human							
Resources							

Anti-Submarine	Anti-Submarine Warfare						
Anti-Submarine	Anti-Submarine Warfare Torpedo Exercise – Maritime Patrol Aircraft						
Military Expended Material	Ingestible Material: Small decelerators/parachutes, parachutes-medium	Military Recoverable Material	Recoverable sub-surface targets, lightweight torpedoes (non-explosive)				
	Non-Ingestible Material: Lightweight torpedo accessories, sonobuoys (non-explosive), sonobuoy wires, expendable sub-surface targets						
Sonar and Other Transducer Bins	Mid-Frequency: Torpedo MF5 TORP1	es:					
In-Water Explosive Bins	None						
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3.2) Active sonar						
Assumptions Used for Analysis	Submarine may provide service as the target. If target is air-dropped, one parachute per target. Stressors to human resources were not analyzed for this activity since it occurs greater than 12 NM from shore.						

A.2.5.3 Torpedo Exercise - Ship

Anti-Submarine	: Warfare					
Anti-Submarine	Warfare Torpedo Exercise –	Ship				
Short	Surface ship crews search fo	r, track, and detect	Typical Duratio	n		
Description	submarines. Exercise torped	loes are used during	2-5 hours			
	this exercise.					
Long Description	Surface ships search for, detect, and track threat submarines to determine a firing position to launch a torpedo and attack the submarine. A surface ship operates at slow speeds while employing hull-mounted or towed array sonar. Passive or active sonar is employed depending on the type of threat submarine, the tactical situation, and environmental conditions. The antisubmarine warfare target used for this exercise is a MK-39 Expendable Mobile Anti-Submarine Warfare Training Target, MK-30 Target, or live submarine. This exercise may involve a single ship, or be undertaken in the context of a coordinated larger exercise involving multiple aircraft, ships, and submarines, including a major range event. The exercise torpedo is recovered by helicopter or small craft. The preferred range for this exercise					
			conducted in othe	er range complexes depending		
Typical	on training requirements and available assets. Platforms: Rotary-wing aircraft, small boats, surface combatants					
Typical Components	Targets: Sub-surface targets		compatants			
Components	Systems being Trained/Tested: Sonar systems, acoustic countermeasures, torpedoes					
Standard	Vessel safety	Typical Locations				
Operating	Aircraft safety	Range Complexes/Tes	ing Ranges:	nland Waters/Pierside:		
Procedures	Towed in-water device	Jacksonville		None		
(Section 2.3.3)	safety	Virginia Capes				
Stressors to	Acoustic:	Physical Disturbance a	nd Strike:	Energy:		
Biological	Sonar and other	Aircraft and aerial targ	ets	In-air electromagnetic		
Resources	transducers	Vessels and in-water d		devices		
	Aircraft noise	Military expended mat	erials			
	Vessel noise			Entanglement:		
	Evalorives	Ingestion:	orials other	Wires and cables		
	Explosives: None	Military expended mat than munitions	eriais – otilei			
Stressors to	Air Quality:		ts and Water Qu	ality:		
Physical	Criteria air pollutants	Metals	Chem			
Resources	,	Other materials				
	Habitats:					
	Physical disturbance and stri	ke – military				
	expended material					
Stressors to	None					
Human						
Resources						

Anti-Submarine	e Warfare		
Anti-Submarine	e Warfare Torpedo Exercise – Ship		
Military Expended Material	Ingestible Material: Small decelerators/parachutes Non-Ingestible Material: Sonobuoys (non-explosive), sonobuoy wires, expendable bathythermographs, expendable bathythermograph wires, lightweight torpedo accessories, expendable sub- surface targets	Military Recoverable Material	Recoverable sub-surface targets, lightweight torpedoes (non- explosive)
Sonar and Other Transducer Bins	MF1 ASW3 Torpedo TORP1	marine Warfare: es:	
In-Water Explosive Bins	None		
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3.2) Active sonar Physical Disturbance and Strike: (Section Vessel movement Towed in-water devices	5.3.4)	
Assumptions Used for Analysis	Submarines may provide service as the tar Stressors to human resources were not an from shore.	•	

A.2.5.4 Torpedo Exercise – Submarine

Anti-Submarine	e Warfare					
Anti-Submarine	Warfare Torpedo Exercise –	Submarine				
Short	Submarine crews search for	, track, and de	etect	Typic	cal Duration	
Description	submarines. Exercise torpedoes are used during this exercise.			8 hours		
Long	Submarine crews search for,	detect and to	rack a threa	t subm	narine to develop firing position to	
Description	launch a torpedo. A single submerged submarine operates at slow speeds and various depths while using its hull mounted or towed array sonar to track a threat submarine. Passive sonar is used almost exclusively. Non-explosive exercise torpedoes can be fired and active sonar can be used during this training exercise. This exercise may involve a single submarine, or be undertaken in the context of a coordinated					
	•	_			rines, including a major range event.	The
	_	-	-		The preferred range for this exercise i	
	- ·	•			n other range complexes depending of	
	training requirements and av				and a great production of	
Typical	Platforms: Rotary-wing aircr			ines		
Components	Targets: Sub-surface targets					
	Systems being Trained/Tested: Sonar systems, acoustic countermeasures, torpedoes					
Standard	Vessel safety	Typical Loca			, , ,	
Operating	Aircraft safety					
Procedures	Towed in-water device		plexes/Test	ting Ra	anges: Inland Waters/Pierside:	
(Section 2.3.3)	safety	Jacksonville			None	
(0000000000)	,	Northeast				
		Virginia Cap			<u> </u>	
Stressors to	Acoustic:	-	sturbance a			
Biological	Sonar and other		d in-water d		In-air electromagnetic	
Resources	transducers	Military exp	pended mat	erials	devices	
	Aircraft noise					
	Vessel noise	Ingestion:			Entanglement:	
		None			Wires and cables	
	Explosives:					
	None					
Stressors to	Air Quality:			ts and	l Water Quality:	
Physical	Criteria pollutants		Metals			
Resources	Habitats: Physical disturbance and stri expended material	ke – military				
Stressors to	None					
Human						
Resources						
Military Expended Material	Ingestible Material: None	Military Recoverable sub-surface targets, torpedoes (non-explosive) Material				
	Non-Ingestible Material: Guidance wires, heavyweigh accessories	it torpedo				

Anti-Submarine	Anti-Submarine Warfare			
Anti-Submarine	nti-Submarine Warfare Torpedo Exercise – Submarine			
Sonar and	Mid-Frequency: Anti-Submarine Warfare:			
Other	MF3	ASW4		
Transducer				
Bins	High-Frequency:	Torpedoes:		
	HF1	TORP2		
In-Water	None			
Explosive				
Bins				
Procedural	Acoustic Stressors: (Section 5.3.2)			
Mitigation	Active sonar			
Measures				
	Physical Disturbance and Strike: (Section 5.3.4)			
	Vessel movement			
	Towed in-water devices			
Assumptions	Torpedoes are recovered.			
Used for	Guidance wire has a low tensile strength and breaks easily. Weights and flex tubing sink rapidly.			
Analysis	Stressors to human resources w	ere not analyzed for this activity since it occurs greater than 12 NM		
	from shore.			

A.2.5.5 Tracking Exercise – Helicopter

Anti-Submarine	Warfare					
	Warfare Tracking Exercise –	Helicopter				
Short	Helicopter crews search for,		tost	Typi	ical Duration	
Description	submarines.	track, and de	rieci	2-4 hours		
		and dinning	conor coord		detect, classify, localize, and track a	
Long Description	·				firing solution that could be used to	
Description	launch a torpedo and destro	_		iiig a	illing solution that could be used to	
	laurich a torpedo and destro	y the subman	iiie.			
					d by a helicopter operating at altitudes	
					employed from an altitude of about 50	
	ft. after the search area has been narrowed based on the sonobuoy search.					
	The anti-submarine warfare	target used fo	or this exerc	cise m	nay be a MK-39 Expendable Mobile Anti-	
	submarine Warfare Training	Target, a MK	-30 target, o	or a liv	ve submarine. This exercise may involve a	
	single aircraft, or occur duri	ng a coordinat	ted larger ex	xercise	e involving multiple aircraft and ships,	
			-		such as the MQ-8 Fire Scout, may also be	
	-				ted range, but it may be conducted in	
Tourism !	other range complexes depending on training requirements and available assets. Platforms: Rotary-wing aircraft, small boats, unmanned aerial systems					
Typical Components			its, unmann	ed ae	erial systems	
Components	Targets: Sub-surface targets Systems being Trained/Tested:)Sonar systems, sonobuoys					
Standard	Vessel safety	Typical Loca		buoys	3	
Operating	Aircraft safety					
Procedures	Unmanned aerial, surface,	Range Com	plexes/Test	ing Ra	_	
(Section 2.3.3)	and subsurface vehicle	Jacksonville			None	
	safety	Navy Cherry Virginia Cap				
		Other AFTT				
Stressors to	Acoustic:	Physical Dis		nd Str	rike: Energy:	
Biological	Sonar and other	Aircraft and			In-air electromagnetic	
Resources	transducers	Vessels and	_			
	Aircraft noise	Military exp	ended mat	erials		
	Vessel noise				Entanglement:	
		Ingestion:			Decelerators/parachutes	
	Explosives:	Military exp		erials ·	– other Wires and cables	
_	None	than mu				
Stressors to	Air Quality:			ts and	d Water Quality:	
Physical Resources	Criteria air pollutants		Metals Other ma	torial	Chemicals	
Resources	Habitats:		Other ma	iteriai	15	
	Physical disturbance and stri	ke – military				
	expended material	ike illilitary				
Stressors to	None					
Human						
Resources						
Military	Ingestible Material:		Military		Recoverable sub-surface targets	
Expended	Small decelerators/parachut	es	Recoveral	ble		
Material			Material			
	Non-Ingestible Material:					
	Sonobuoys (non-explosive),					
	wires, expendable sub-sur	Tace targets				

Anti-Submarine	e Warfare		
Anti-Submarine	e Warfare Tracking Exercise – Helicopter		
Sonar and	Mid-Frequency:		
Other	MF4		
Transducer	MF5		
Bins			
In-Water	None		
Explosive			
Bins			
Procedural	Acoustic Stressors: (Section 5.3.2)	Physical Disturbance and Strike: (Section 5.3.4)	
Mitigation	Active sonar	Vessel movement	
Measures			
Assumptions	Tracking exercise can occur in all locations.		
Used for	Submarines may provide service as the target		
Analysis	Stressors to human resources were not analyze	zed for this activity since it occurs greater than 12 NM	
	from shore.		

A.2.5.6 Tracking Exercise – Maritime Patrol Aircraft

Anti-Submarine	e Warfare					
Anti-Submarine	Warfare Tracking Exercise –	Maritime Patrol Aircraft				
Short	Maritime patrol aircraft crev	ws search for, track,	Typical Dura	tion		
Description	and detect submarines.	, ,	2-8 hours			
Long Description	Fixed-wing maritime patrol aircraft employ sonobuoys to search for, detect, classify, localize, and track a simulated threat submarine with the goal of determining a firing solution that could be used to launch a torpedo and destroy the submarine. Sonobuoys (both passive and active) are typically employed by a maritime patrol aircraft operating at altitudes below 3,000 ft. However, sonobuoys may be released at higher altitudes. Sonobuoys are deployed in specific patterns based on the expected threat submarine and specific water conditions. Depending on these two factors, these patterns will cover many different size areas. For certain sonobuoys, tactical parameters of use may be classified. The anti-submarine warfare target used for this exercise may be a MK-39 Expendable Mobile Anti-Submarine Warfare Training Target, a MK-30 target, or a live submarine. This exercise may involve a single aircraft, or be undertaken in the context of a coordinated larger exercise involving multiple aircraft and vessels, including a major					
Typical	range event. Platforms: Fixed-wing aircraft					
Components	Targets: Sub-surface targets Systems being Trained/Tested: Sonobuoys, acoustic countermeasures					
Standard Operating Procedures (Section 2.3.3)	Vessel safety Aircraft safety Weapons firing safety Swimmer defense activity safety Unmanned aerial, surface, and subsurface vehicle safety Towed in-water device	Typical Locations Range Complexes/Test Jacksonville Navy Cherry Point Northeast Virginia Capes	ting Ranges:	Inland Waters/Pierside: None		
Stressors to Biological Resources	safety Acoustic: Sonar and other transducers Aircraft noise Vessel noise Explosives: None	Physical Disturbance a Aircraft and aerial targ Vessels and in-water d Military expended mat Ingestion: Military expended mat than munitions	ets evices erials	Energy: In-air electromagnetic devices Entanglement: Decelerators/parachutes Wires and cables		
Stressors to Physical Resources	Air Quality: Criteria air pollutants Habitats: Physical disturbance and striexpended material	Metals Other ma		Quality: emicals		
Stressors to Human Resources	None					

Anti-Submarine	e Warfare			
Anti-Submarine	Anti-Submarine Warfare Tracking Exercise – Maritime Patrol Aircraft			
Military	Ingestible Material:	Military	Recoverable sub-surface targets	
Expended	Small decelerators/parachutes	Recoverable		
Material		Material		
	Non-Ingestible Material:			
	Sonobuoys (non-explosive), sonobuoy			
	wires, expendable sub-surface targets			
Sonar and	Mid-Frequency: Anti-Sub	marine Warfare:		
Other	MF5 ASW2			
Transducer	ASW5			
Bins				
In-Water	None			
Explosive				
Bins				
Procedural	None			
Mitigation				
Measures				
Assumptions	Tracking exercise can occur in all locations			
Used for	Submarine may provide service as the target.			
Analysis	If target is air-dropped, one parachute per target.			
	Stressors to human resources were not an	alyzed for this ac	tivity since it occurs greater than 12 NM	
	from shore.			

A.2.5.7 Tracking Exercise – Submarine

Anti-Submarine	· Warfare					
Anti-Submarine	Warfare Tracking Exercise –	Submarine				
Short	Submarine crews search for		etect	Typica	al Duration	
Description	submarines.	,		8 hou		
Long	Submarine crews search for.	detect. and t	rack a threat		arine to develop firing position to	
Description		launch a torpedo.				
	•	A single submerged submarine operates at slow speeds and various depths while using its hull				
	= =	=	=		_	
	mounted or towed array sor					
	warfare training target, MK				pendable mobile anti-submarine	
	= =		_	-	en in the context of a coordinated	
	-	_			nes, including a major range event.	
Typical	Platforms: Submarines	tipic un crure,	3111p3) arra 30	20111011	nes, meraanig a major range eventi	
Components	Targets: Sub-surface targets	;				
	Systems being Trained/Tes		r systems, a	coustic	countermeasures	
Standard	Vessel safety	Typical Loca				
Operating	Towed in-water device	Damas Carre		D	and Makeya (Dienside)	
Procedures	safety	Range Complexes/Testing Ranges: Inland Waters/Pierside: Gulf of Mexico None				
(Section 2.3.3)		Jacksonville			None	
		Navy Cherry	Point			
		Northeast				
		Virginia Cap	es			
		Other AFTT				
Stressors to	Acoustic:	Physical Dis	sturbance ar	nd Strik	ke: Energy:	
Biological	Sonar and other	Vessels and			None	
Resources	transducers	Military exp	ended mate	erials		
	Vessel noise				Entanglement:	
	Fundastrias	Ingestion:			Wires and cables	
	Explosives: None	None				
Stressors to	Air Quality:		Sadiment	c and l	Water Quality:	
Physical	None		Metals	s allu v	water Quanty.	
Resources	None		Wictais			
	Habitats:					
	Physical disturbance and stri	ke – military				
	expended material					
Stressors to	None	-				
Human						
Resources						
Military	Ingestible Material:		Military		Recoverable sub-surface targets	
Expended	None		Recoverab	le		
Material	Non-to-codible 88 to 1.1		Material			
	Non-Ingestible Material:	rots				
	Expendable sub-surface targ	gets				

Anti-Submarine	: Warfare				
Anti-Submarine	Warfare Tracking Exercise	- Submarine			
Sonar and	Mid-Frequency:		Anti-Submarine Warfare:		
Other	MF3	ASW4			
Transducer					
Bins	High-Frequency:				
	HF1				
In-Water	None				
Explosive					
Bins					
Procedural	Acoustic Stressors: (Section	on 5.3.2)	Physical Disturbance and Strike: (Section 5.3.4)		
Mitigation	Active sonar		Vessel movement		
Measures			Towed in-water devices		
Assumptions	Stressors to human reso	ources were not anal	yzed for this activity since it occurs greater than		
Used for	12 NM from shore. For biological resource analysis, vessel noise and vessel strike are only				
Analysis	analyzed for the period	ds while the submarine	s are surfaced, typically brief in nature. Mitigation		
			ly considered during the period of surfacing as well.		

A.2.5.8 Tracking Exercise – Ship

Anti-Submarine	- Warfare					
	Warfare Tracking Exercise –	Shin				
Short	_	•	dataat	Typic	al Duration	
Description	Surface ship crews search for submarines.	or, track, and t	letect			
			*I	2-4 h		
Long				narine	s to determine a firing position to	
Description	launch a torpedo and attack	the submarin	e.			
	A surface ship operates at slo	A surface ship operates at slow speeds while employing sonobuoys, hull-mounted sonars, or				
	towed array sonar. Passive o	towed array sonar. Passive or active sonar is employed depending on the type of threat				
	submarine, the tactical situa	tion, and envi	ronmental c	onditi	ons. The target for this exercise is	
	· ·		ubmarine W	arfare	Training Target, MK-30 Recoverable	
	Training Target, or live subm	arine.				
	This exercise may involve a s	single ship or	he undertak	en in 1	the context of a coordinated larger	
					ncluding a major range event.	
Typical	Platforms: Surface combata					
Components	Targets: Sub-surface targets					
•	Systems being Trained/Test	ted: MF11, MI	F12Sonar sy	stems	, acoustic countermeasures	
Standard	Vessel safety	Typical Loca				
Operating	Towed in-water device		· /= ··		11 124 - 75: 11	
Procedures	safety		plexes/Testi	ng Ra	-	
(Section 2.3.3)		Gulf of Mexico None Jacksonville			None	
		Navy Cherry	Point			
		Northeast	TOILL			
		Virginia Cap	es			
		Other AFTT				
Stressors to	Acoustic:	Physical Dis	sturbance ar	nd Stri	ke: Energy:	
Biological	Sonar and other	Vessels and	in-water de	vices	In-air electromagnetic	
Resources	transducers	Military exp	ended mate	erials	devices	
	Vessel noise					
		Ingestion:			Entanglement:	
	Explosives:	No			Wires and cables	
	None					
Stressors to	Air Quality:			s and	Water Quality:	
Physical	Criteria air pollutants		Metals			
Resources	Habitats:					
	Physical disturbance and stri	ike – military				
	expended material	ike – Illilital y				
Stressors to	None		<u>-</u>			
Human	110116					
Resources						
Military	Ingestible Material:		Military		Recoverable sub-surface targets	
Expended	None	Recoverable Recoverable				
Material			Material			
	Non-Ingestible Material:					
	Expendable sub-surface targ					
	expendable bathythermog					
	expendable bathythermog	graph wires				

Anti-Submarine	e Warfare				
Anti-Submarine	Warfare Tracking Exercis	e – Ship			
Sonar and	Mid-Frequency:	Anti-Submarine Warfare:			
Other	MF1	ASW1			
Transducer	MF11	ASW3			
Bins	MF12				
In-Water	None				
Explosive					
Bins					
Procedural	Acoustic Stressors: (Sect	ion 5.3.2)	Physical Disturbance and Strike: (Section 5.3.4)		
Mitigation	Active sonar		Vessel movement		
Measures			Towed in-water devices		
Assumptions	A submarine may provid	e service as the targ	et.		
Used for	Stressors to human resources were not analyzed for this activity since it occurs greater than 12 NM				
Analysis	from shore.				

A.2.6 ELECTRONIC WARFARE

Electronic warfare is the mission area of naval warfare that aims to control use of the electromagnetic spectrum and to deny its use by an adversary. Typical electronic warfare activities include threat avoidance training, signals analysis for intelligence purposes, and use of airborne and surface electronic jamming devices to defeat tracking systems.

A.2.6.1 Counter Targeting Chaff Exercise – Aircraft

Electronic Warf	are					
Counter Target	ing Chaff Exercise – Aircraft					
Short	Fixed-winged aircraft and he	elicopter aircrews	Typical Durat	tion		
Description	deploy chaff to disrupt threa guidance radars.	at targeting and missile	1-2 hours			
Long Description	Fixed-winged aircraft and helicopter aircrews deploy chaff to disrupt threat targeting and missile guidance radars.					
	Fixed-winged aircraft and he or missiles, dispense chaff, a deceives the inbound missile	nd immediately maneuv	er to defeat th			
		deceive enemy radars. C	haff is employe	ips cut in various lengths to elicit ed to create a target that will lure atform.		
Typical	Platforms: Fixed-wing aircra	ft, rotary-wing aircraft				
Components	Targets: None					
	Systems being Trained/Test					
Standard	Aircraft safety	Typical Locations				
Operating		Range Complexes/Tes	ting Ranges:	Inland Waters/Pierside:		
Procedures		Gulf of Mexico None				
(Section 2.3.3)		Jacksonville				
		Key West				
		Navy Cherry Point				
		Virginia Capes				
Stressors to	Acoustic:	Physical Disturbance a		Energy:		
Biological	Aircraft noise	Aircraft and aerial targ		In-air electromagnetic		
Resources		Military expended mat	erials	devices		
	Explosives:					
	None	Ingestion:		Entanglement:		
		Military expended mat than munitions	eriais – otner	None		
Strossors to	Air Quality:		ts and Water (Quality		
Stressors to Physical	Criteria air pollutants	Metals		naterials		
Resources	Criteria an politicants	Wictais	Otheri	nateriais		
nesources	Habitats:					
	Physical disturbance and stri	ke – military				
	expended material	1				
Stressors to	None	-				
Human						
Resources						

Electronic Warf	Electronic Warfare						
Counter Targeting Chaff Exercise – Aircraft							
Military Expended Material	Ingestible Material: Per chaff: one chaff-air cartridge, one plastic endcap, one compression pad or one plastic piston, chaff fibers Non-Ingestible Material: None	Military Recoverable Material	None				
Sonar and Other Transducer Bins	None						
In-Water Explosive Bins	None						
Procedural Mitigation Measures	None						
Assumptions Used for Analysis	Chaff is usually expended while conductin maneuvering. Stressors to human resources were not ar 12 NM from shore.	_					

A.2.6.2 Counter Targeting Chaff Exercise – Ship

Electronic Warf	are						
Counter Targeting Chaff Exercise – Ship							
Short	Surface ship crews deploy ch	haff to disrup	t threat	Typical Durat	tion		
Description	targeting and missile guidan	•		1-2 hours			
Long	Surface ship crews deploy chaff to disrupt threat targeting and missile guidance radars to defend						
Description	against an attack.						
	Surface ship crews detect electronic targeting signals from threat radars or missiles, dispense chaff,						
					ceives the inbound missile and		
	T				n is approximately 1.5 hours.		
	Chaff is a radar reflector ma		• •		• •		
			•	•	nployed create a target that will		
	lure enemy radar and weap	ons system av	way from the	actual friendl	y platform.		
		vanced count	termeasure sy	stems, such a	as the MK 53 Decoy Launching		
	System (Nulka).						
Typical	Platforms: Navy ships						
Components	Targets: None	tadı Nasa					
Standard	Systems being Trained/Test		ations				
Operating	Vessel safety	Typical Loca	ations				
Procedures		Range Complexes/Testing Ranges: Inland Waters/Pierside:					
(Section 2.3.3)		Gulf of Mexico None					
,		Jacksonville					
		Navy Cherry Point Virginia Capes					
Stressors to	Acoustic:	!	isturbance an	d Strike:	Energy:		
Biological	Vessel noise	-	d in-water de		In-air electromagnetic		
Resources			pended mate		devices		
	Explosives:	•	•		In-water electromagnetic		
	None	Ingestion:			devices		
		-	pended mater	rials – other			
		than mu	unitions		Entanglement:		
Church	Alic Constitu		C- !! :		None		
Stressors to	Air Quality:			and Water C	Quality: materials		
Physical Resources	Criteria air pollutants		Metals	otneri	ilialEllaiS		
	Habitats:						
	Physical disturbance and stri	ike – militarv					
	expended material						
Stressors to	None						
Human							
Resources							
Military	Ingestible Material:		Military	None			
Expended	Expended components of ch	natt-ship	Recoverabl	le			
Material	(chaff-ship fibers)		Material				
	Non-Ingestible Material:						
	MK 53 decoy, chaff-ship cart	tridges					
	33 dada,, chair ship car						

Electronic Warf	Electronic Warfare						
Counter Target	Counter Targeting Chaff Exercise – Ship						
Sonar and	None						
Other							
Transducer							
Bins							
In-Water	None						
Explosive							
Bins							
Procedural	Physical Disturbance and Strike: (Section 5.3.4)						
Mitigation	Vessel movement						
Measures							
Assumptions	Stressors to human resources were not analyzed for this activity since it occurs greater than 12 NM						
Used for	from shore.						
Analysis							

A.2.6.3 Counter Targeting Flare Exercise

Electronic Warfare								
	Counter Targeting – Flare Exercise							
Short	Fixed-winged aircraft and he	eliconter aircr	ews	Tyni	cal Durat	tion		
Description	deploy flares to disrupt thre		issile		cai Daia			
Jesu puon	guidance systems.	ac illia ca illi	.55110	1-2 hours				
Long	Fixed-winged aircraft and he	elicopter aircr	ews deploy	flares	to disrup	ot threat infrared missile		
Description	guidance systems.							
	Aircraft detect electronic targeting signals from threat radars or missiles or a threat missile plume when launched and dispense flares and immediately maneuver to defeat the threat. This exercise trains aircraft personnel in the use of defensive flares designed to confuse infrared sensors or infrared homing missiles, thereby causing the sensor or missile to lock onto the flares instead of the real aircraft. Typically an aircraft will expend five flares in an exercise while operating above 3,000 ft. Flare exercises are often conducted with chaff exercises, rather than as a stand-alone exercise.							
Typical	Platforms: Fixed-wing aircra	aft, rotary-win	g aircraft					
Components	Targets: None							
	Systems being Trained/Tes							
Standard	Aircraft safety	Typical Loca	itions					
Operating Procedures		Range Com	plexes/Test	ing Ra	anges:	Inland Waters/Pierside:		
(Section 2.3.3)		Gulf of Mex	ico			None		
(30001011 21313)		Jacksonville						
		Key West						
		Navy Cherry						
		Virginia Cap						
Stressors to	Acoustic:	-	sturbance a		ike:	Energy:		
Biological Resources	Aircraft noise	Aircraft and	a aeriai targi bended mat			In-air electromagnetic devices		
Resources	Explosives:	wiiitary exp	Jenueu mat	eriais		devices		
	None	Ingestion:				Entanglement:		
		-	ended mat	erials ·	– other	None		
		than mu			-			
Stressors to	Air Quality:	_	Sedimen	ts and	Water C	Quality:		
Physical	Criteria air pollutants		Metals					
Resources								
	Habitats:							
	Physical disturbance and stri	ike – military						
	expended material	<u>-</u>	-		-			
Stressors to	None							
Human Resources								
Military	Ingestible Material:		Military		None			
Expended	Per flare: one casing, one co	mpression	Recovera	ble	None			
Material	pad (closed cell foam) or o	-	Material					
	piston, one plastic endcap (rubber, nitrile)	-						
	Non-Ingestible Material: None							

Electronic Warf	are
Counter Target	ing – Flare Exercise
Sonar and	None
Other	
Transducer	
Bins	
In-Water	None
Explosive	
Bins	
Procedural	None
Mitigation	
Measures	<u>_</u>
Assumptions	Approximately five flares per aircraft are expended per exercise.
Used for	All combustible material in flares is assumed to be consumed before contact of the casing with the
Analysis	water.
	Stressors to human resources were not analyzed for this activity since it occurs greater than 12 NM
	from shore.

A.2.6.4 Electronic Warfare Operations

Electronic Warfare Operations Short Aircraft and surface ship crews control portions of Typical Duration							
Short Aircraft and surface ship crews control portions of Typical Duration							
Description the electromagnetic spectrum used by enemy							
systems to degrade or deny the enemy's ability to 1-2 hours							
take defensive actions.							
Long Aircraft and surface ship crews control the electromagnetic spectrum used by enemy sy							
Description degrade or deny the enemy's ability to take defensive actions. Electronic Warfare Opera	ations can be						
active or passive, offensive or defensive. Fixed-wing aircraft employ active jamming and	or defensive. Fixed-wing aircraft employ active jamming and deception						
against enemy search radars to mask the friendly inbound strike aircraft mission. Surface	-						
detect and evaluate enemy electronic signals from enemy aircraft or missile radars, eva							
of action concerning the use of passive or active countermeasures, then use ship manel							
either chaff, flares, active electronic countermeasures, or a combination of them to def	eat the						
threat.							
Typical Platforms: Fixed-wing aircraft, surface combatants Components Targets: Air targets, electronic warfare targets							
Components Targets: Air targets, electronic warfare targets Systems being Trained/Tested: Radar systems							
Standard Vessel safety Typical Locations							
Operating Aircraft safety							
Procedures Range Complexes/Testing Ranges: Inland Waters/Pie	rside:						
(Section 2 3 3) Jacksonville None							
Navy Cherry Point	Navy Cherry Point						
Virginia Capes							
Stressors to Acoustic: Physical Disturbance and Strike: Energy:	41 -						
BiologicalAircraft noiseAircraft and aerial targetsIn-air electromaResourcesVessel noiseVessels and in-water devicesdevices	ignetic						
vessels and in-water devices devices							
Explosives: Ingestion: Entanglement:							
None None None							
Stressors to Air Quality: Sediments and Water Quality:							
Physical Criteria air pollutants None							
Resources							
Habitats:							
None							
Stressors to Cultural Resources: Socioeconomic Resources: Public Health and	Safety:						
Human Physical disturbance and Accessibility Physical interaction	ns						
Resources strike Airborne acoustics In-air energy							
Physical disturbance and strike							
Military Ingestible Material: Military None							
Expended None Recoverable							
Material Material Non-Ingestible Material:	Material						
None							
Sonar and None							
Other							
Transducer							
Bins							
In-Water None							
Explosive							
Bins							

Electronic Warf	Electronic Warfare					
Electronic Warf	Electronic Warfare Operations					
Procedural	Physical Disturbance and Strike: (Section 5.3.4)					
Mitigation	Vessel movement					
Measures						
Assumptions	All chaff and flares involved in this exercise are covered under chaff exercises and flare exercises,					
Used for	respectively.					
Analysis						

A.2.6.5 High-Speed Anti-Radiation Missile Exercise (Air-to-Surface)

Electronic Warf	are							
	i-Radiation Missile Exercise (A	\ir-to-Surface\						
Short	· · · · · · · · · · · · · · · · · · ·		Т	ypical Duration				
Description	Aircrews launch a High-Spee							
				-2 hours				
Long	Aircrews detect radar signals from a simulated threat radar site and launch a High-Speed Anti-							
Description		high-explosive) to destroy or disable the threat radar site. One or more fighter						
		lar site from high altitude. Once the target is located with onboard						
		es a High-Speed Anti-Radiation Missile at the electronic signal. At-sea						
		ainst a target vessel or a specially configured target barge that has a itter that the missile will seek after being fired from the launch aircraft.						
Tunical			SSIIE WIII SEE	ek arter benig nred from the ladnen airci	ait.			
Typical	Platforms: Fixed-wing aircra							
Components	Targets: Barge with an electron		me					
6	Systems being Trained/Test	-						
Standard	Aircraft safety	Typical Locatio	ns					
Operating		Range Comple	xes/Testing	g Ranges: Inland Waters/Pierside:				
Procedures		Jacksonville	_	None				
(Section 2.3.3)		Navy Cherry Po	oint					
		Virginia Capes						
Stressors to	Acoustic:	Physical Disturbance and Strike: Energy:						
Biological	Aircraft noise	Aircraft and ae	erial targets	In-air electromagnetic				
Resources		In-air explosives devices						
	Explosives:							
	In-air explosives	Ingestion: Entanglement:						
		Military expen	ded materia	als – None				
		munitions						
Stressors to	Air Quality:	9	Sediments a	and Water Quality:				
Physical	Criteria air pollutants		Explosives	Chemicals				
Resources		Ŋ	Metals	Other materials				
	Habitats:							
	Physical disturbance and stri	ke – military						
	expended material							
Stressors to	None							
Human								
Resources		· ·		-				
Military	Ingestible Material:		lilitary	None				
Expended	Missile fragments		ecoverable					
Material		I N	Naterial					
	Non-Ingestible Material:							
	None							
Sonar and	None							
Other								
Transducer								
Bins	N.	_		_ .				
In-Water	None							
Explosive								
Bins	<u>l</u>							

Electronic Warf	Electronic Warfare					
High Speed Ant	i-Radiation Missile Exercise (Air-to-Surface)					
Procedural	Explosive Stressors: (Section 5.3.3) Explosive					
Mitigation	missiles and rockets					
Measures						
Assumptions	All chaff and flares involved in this exercise are covered under chaff exercises and flare exercises,					
Used for	respectively.					
Analysis	Stressors to human resources were not analyzed for this activity since it occurs greater than 12 NM					
	from shore.					

A.2.7 EXPEDITIONARY WARFARE

A.2.7.1 Dive and Salvage Operations

Expeditionary Warfa	re						
Dive and Salvage Ope							
Short Description	Navy divers perform of	live operation	ns and	Typic	al Dura	tion	
·	salvage training.	с оролино.		12 ho			
Long Description	Navy divers will conduct a variety of salvage tra					de debeaching operations	
20118 2 00011 011011	underwater repairs to ships, underwater survey operations, and other underwater training as						
	required.						
Typical	Platforms: Support cr	aft, unmanne	d underwat	ter vehi	icles		
Components	Targets: None						
•	Systems being Traine	d/Tested: Su	bmersible t	raining	aids		
Standard	Vessel safety	Typical Loca	ations				
Operating	Unmanned aerial,	D C	/	D.		taland Water of Dispoid or	
Procedures	surface, and	Range Com Gulf of Mex	-	ting Ka	nges:	Inland Waters/Pierside: Naval Station Norfolk basin	
(Section 2.3.3)	subsurface	Jacksonville				Willoughby Bay	
	vehicle safety	Key West				Joint Expeditionary Base Little	
		Navy Cherry	, Point			Creek harbor	
		Virginia Cap				Naval Station Mayport basin and	
		Viiginia cap	viiginia capes		beach		
Stressors to	Acoustic:	Physical Di	Physical Disturbance and Strike:			Energy:	
Biological	Vessel noise	Vessels and				None	
Resources		Seafloor de	vices				
	Explosives:					Entanglement:	
	None	Ingestion:				None	
		None					
Stressors to	Air Quality:		Sedimen	ts and	Water	Quality:	
Physical Resources	Criteria air pollutants		None				
	Habitats:	and about a					
	Physical disturbance a seafloor devices	na strike –					
Stressors to	Cultural Resources:	Sociooso	nomic Reso	DUKCOCI		Public Health and Safety:	
Human Resources	Physical disturbance	Accessibi		•		Physical interactions	
Human Resources	and strike		disturbance	· ·		i frysical interactions	
Military Expended	Ingestible Material:	Thysical	Military	dila st	None		
Material	None		Recovera	ble	None		
			Material				
	Non-Ingestible Mater	ial:					
	None						
Sonar and Other	None					-	
Transducer Bins							
In-Water Explosive	None						
Bins							
Procedural	Physical Disturbance a	and Strike: (S	ection 5.3.4	!)			
Mitigation	Vessel movement						
Measures							
Assumptions Used	The practice salvage p	latform can b	e sunk and	then re	efloated	d and removed.	
for Analysis							

A.2.7.2 Maritime Security Operations – Anti-Swimmer Grenades

Expeditionary	aritime Security Opera	alions - Anti	i-Swill	mer Grena	aues				
	rity Operations – Anti-Swin	nmor Granadas							
				Tunical Dun	ation				
Short	Small boat crews engage i	-		Typical Dur	ation				
Description	activities by using anti-sw	_	s to	1 hour					
	defend against hostile div								
Long	Boat crews train to maneuver small boats in specific search patterns while surveying the area for								
Description	evidence of scuba activity. Crews train in the safe handling and use of anti-swimmer grenades to								
	counter the diver threat.								
Typical									
Components	Targets: None								
	Systems being Trained/To								
Standard	Vessel safety	Typical Location	ons						
Operating		Range Compl	exes/Te	sting	Inland Waters/Pierside:				
Procedures		Ranges:	CACO, 10	B	None				
(Section		Gulf of Mexico	1		TTO TO				
2.3.3)		Jacksonville							
		Navy Cherry P	oint						
		Northeast							
		Virginia Capes	;						
Stressors to	Acoustic:	Physical Distu		and Strike:	Energy:				
Biological	Vessel noise	Vessels and in			None				
Resources	7 0000. 110.00	Underwater e							
	Explosives:	Military expe	-		Entanglement:				
	Underwater explosives	, , , , , , , , , , , , , , , , , , , ,			None				
		Ingestion:							
		Military expe	nded ma	iterials –					
		munitions							
Stressors to	Air Quality:	9	Sedimen	ts and Wate	r Quality:				
Physical	Criteria air pollutants	E	Explosive	es Me	tals				
Resources									
	Habitats:								
	Physical disturbance and s	strike –							
	military expended mat	erial							
	Underwater explosives								
Stressors to	Cultural Resources:	Socioecono		ources:	Public Health and Safety:				
Human	Physical disturbance and	Accessibility	-		Physical interactions				
Resources	strike	Physical dis	turbanc	e and strike	Underwater energy				
	Underwater explosives				,				
Military	Ingestible Material:	1	Military		None				
Expended	Grenade fragments		Recover						
Material		ı	Materia						
	Non-Ingestible Material:								
	None								
Sonar and	None	-							
Other									
Transducer									
Bins									
In-Water	E2								
Explosive									

Expeditionary	Expeditionary Warfare						
Maritime Secu	Maritime Security Operations – Anti-Swimmer Grenades						
Bins							
Procedural	Physical Disturbance and Strike: (Section	Explosive Stressors: (Section 5.3.3)					
Mitigation	5.3.4)	Maritime security operations – anti-swimmer					
Measures	Vessel movement	grenades					
Assumptions	Exercises would usually be conducted in esta	ablished underwater detonation areas.					
Used for							
Analysis							

A.2.7.3 Personnel Insertion/Extraction – Air

Expeditionary \	Narfare							
	rtion/Extraction – Air							
			Т.	·i.aal D	At au			
Short Description	Personnel are inserted into			ypical Dura	ation			
•	objective area by fixed-wing			2-4 hours				
Long	Personnel are inserted into	-		_	= -			
Description	helicopters via ropes or jumping into the water. They will conduct an infiltration to an objective							
	(harbor, beach, moored vessel, etc.) and conduct a variety of tasks. The insertion/extraction							
		activities are confined to in-water training. Upon completion of training objectives, personnel are extracted by helicopters or small boats.						
Tunical	Platforms: Fixed-wing aircra		sroft sms	ll boots				
Typical Components	Targets: None	art, rotary-wing air	Ciait, Silic	iii boats				
Components	Systems being Trained/Tes	tad: None						
Chandoud			_					
Standard	Vessel safety	Typical Location	S					
Operating Procedures	Aircraft safety Vessel safety	Range Complexe	es/Testin	g Ranges:	Inland Waters/Pierside:			
(Section 2.3.3)	vesser safety	Jacksonville			Naval Station Mayport basin			
(3600001 2.3.3)		Key West			St. Johns River			
		Virginia Capes			St. Andrew Bay			
					North Bay			
					Lower Chesapeake Bay			
					James River and tributaries			
					York River			
					Mobjack Bay			
					Willoughby Bay			
					Naval Station Norfolk			
					Cheatham Annex pier			
					Joint Expeditionary Base Fort			
					Story			
					Dam Neck Annex			
					Camp Pendleton			
Stressors to	Acoustic:	Physical Disturb			Energy:			
Biological	Aircraft noise	Aircraft and aeri	_		In-air electromagnetic			
Resources	Vessel noise	Vessels and in-w	vater devi	ices	energy			
	Explosives:	Ingestion:			Entanglement:			
	None	None			None			
Stressors to	Air Quality:		diments	and Water				
Physical	Criteria air pollutants		one		~~~~,			
Resources	an pondunto	140						
	Habitats:							
	None							
Stressors to	Cultural Resources:	Socioeconom	ic Resour	ces:	Public Health and Safety:			
Human	Physical disturbance and	Accessibility			Physical interactions			
Resources	strike	Airborne acou	ustics		In-air energy			
		Physical distu		nd strike	<i>5.</i>			
Military	Ingestible Material:		litary	None	•			
Expended	None		coverable					
Material			aterial					
	Non-Ingestible Material:							
	None							

Expeditionary V	Expeditionary Warfare				
Personnel Inser	Personnel Insertion/Extraction – Air				
Sonar and	None				
Other					
Transducer					
Bins					
In-Water	None				
Explosive					
Bins					
Procedural	Physical Disturbance and Strike: (Section 5.3.4)				
Mitigation	Vessel movement				
Measures					
Assumptions	Exercises are typically conducted in waters near land.				
Used for					
Analysis					

A.2.7.4 Personnel Insertion/Extraction – Surface and Subsurface

Expeditionary Warfare							
Personnel Insertion/Extr	action – Surface and	d Subsurface					
Short Description	Personnel are inse			Typic	al Dura	tion	
Short Description	extracted from an		_	туріс	ai Duia	tion	
	small boats or sub	-	•	2-4 h	ours		
Long Description				alatfor	mc no	rsonnel are inserted in the	
roug pescription	_		-		-	arbor, beach, moored vessel,	
	1			-		ion activities are confined to in-	
	water training.	a variety or ta	isks. The mse	ertion	extract	ion activities are commed to m-	
Typical Components		Platforms: Small boats, manned underwater vehicles					
Typical Components	Targets: None	oats, mannet	underwate	venic	les		
	Systems being Tra	ained/Tested	None				
Standard Operating	Vessel safety						
Standard Operating Procedures	vesser sarety	Typical Loca	itions				
(Section 2.3.3)		Range Com	plexes/Testi	ng Rai	nges:	Inland Waters/Pierside:	
(3000001 2.3.3)		Gulf of Mex	ico			Lower Chesapeake Bay	
		Jacksonville	!			James River and tributaries	
		Key West				York River	
		Navy Cherry Point			Joint Expeditionary Base Little		
		Northeast			Creek beaches and harbor		
		Virginia Capes			Joint Expeditionary Base Fort		
		-			Story		
					St. Julien's Creek Annex pier		
Stressors to Biological	Acoustic:	Physical Dis	sturbance ar	nd Stri	ke:	Energy:	
Resources	Vessel noise	Vessels and	l in-water de	vices		None	
	Explosives:	Ingestion:				Entanglement:	
	None	None				None	
Stressors to Physical	Air Quality:		Sediment	s and \	Water (Quality:	
Resources	Criteria air polluta	nts	None				
	Habitats:						
	None		<u> </u>				
Stressors to Human	Cultural Resource		nomic Resou	urces:		Public Health and Safety:	
Resources	None	Accessibi	- /		.,	Physical interactions	
		Physical (disturbance a	and str	rike		
BAULT C and ad		.1.	B 4:11:4		N		
Military Expended	Ingestible Materia	11:	Military		None		
Material	None		Recoverab	ie			
	Non Ingestible M	atarial.	Material				
	Non-Ingestible Ma	ateriai:					
C							
Sonar and Other	None						
Transducer Bins	Name	-		-		<u> </u>	
In-Water Explosive	None						
Bins	a	1.5 "	/0 :: -	2 61		<u>-</u>	
Procedural Mitigation	Physical Disturbar	ice and Strike	: (Section 5.3	3.4)			
Measures	Vessel movement						
Assumptions Used for	Exercises are typic	ally conducte	d in waters n	iear la	nd.		
Analysis							

A.2.7.5 Personnel Insertion/Extraction – Swimmer/Diver

Expeditionary \	Warfare							
Personnel Inse	rtion/Extraction Training – Sv	wimmer/Diver						
Short	Divers and swimmer infiltra	ite harbors, be	aches,	Typica	al Duration			
Description	or moored vessels and cond	duct a variety o	of tasks.	Up to	12 hours			
Long	Divers and swimmer infiltra	te harbors, be	aches, or m	noored	I vessels and conduct a variety of tasks.			
Description	Activity may include Navy p	ersonnel learn	ing advanc	ed self	f-contained underwater breathing			
	apparatus (SCUBA) diving to	o include: tacti	cs, techniq	ues, an	nd procedures and emergency			
	procedures. Small boats are	procedures. Small boats are used for safety.						
Typical	Platforms: Small boats							
Components	Targets: None							
	Systems being Trained/Tes	ted: None						
Standard	Vessel safety	Typical Locat	tions					
Operating		Range Comp	lexes/Test	ing Rai	inges: Inland Waters/Pierside:			
Procedures		Key West	rickes, rest	B	Lower Chesapeake Bay			
(Section		Virginia Cape	25		Lower chesapeake bay			
2.3.3)								
Stressors to	Acoustic:	Physical Dis						
Biological	Vessel noise	Vessels and	in-water d	evices	None			
Resources	Familianting				Fotos elements			
	Explosives: None	Ingestion:			Entanglement: None			
Stressors to		None	Cadinaan	المصما				
Physical	Air Quality: Criteria air pollutants		None	is and v	Water Quality:			
Resources	Criteria air poliutants		None					
Resources	Habitats:							
	None							
Stressors to	Cultural Resources:	Socioecor	nomic Resc	urces:	: Public Health and Safety:			
Human	None	Accessibil	ity		Physical interactions			
Resources		Physical d	isturbance	and str	trike			
Military	Ingestible Material:		Military		None			
Expended	None		Recoveral	ole				
Material			Material					
	Non-Ingestible Material:							
	None							
Sonar and	None							
Other								
Transducer								
Bins	Nene							
In-Water Explosive	None							
Bins								
Procedural	Physical Disturbance and St	trike (Section	5 3 4)	-	.			
Mitigation	Vessel movement	inc. (Section)	J.J. T /					
Measures	- 55555 vement							
Assumptions	None		-					
Used for								
Analysis								
•								

A.2.7.6 Underwater Construction Team Training

	re								
Underwater Construc	ction Team Training								
Short Nav	y divers conduct underw	ater repair a	nd	Typic	cal Dura	tion			
	struction.				o 12 day				
•	v divers will perform cut	ting welding	assembly			on of deep-water structures,			
_	oring systems, underwate		-						
-	forms: Small boats			-	-,				
	gets: None								
-	tems being Trained/Test	d/Tested: None							
	sel safety	Typical Locations							
Operating				_					
Procedures		Range Com	=	ting Ra	anges:	Inland Waters/Pierside:			
(Section		Gulf of Mex	ico			Various harbors			
2.3.3)		Jacksonville							
,		Key West							
		Virginia Cap							
	ustic:	Physical Dis				Energy:			
	sel noise	Vessels and		levices		None			
Resources		Seafloor devices							
-	osives:	Ingestion:			Entanglement:				
Non	e					None			
		None							
	Quality:		Sedimen	ts and	Water (Quality:			
=	eria air pollutants		None						
Resources									
	itats:								
-	sical disturbance and stri	ke –							
	eafloor devices								
	ural Resources:		nomic Reso	ources	:	Public Health and Safety:			
Human Non	e	Accessibi	•			Physical interactions			
Resources		Physical o	disturbance	and s					
•	stible Material:		Military		None				
Expended Non	e		Recovera	ble					
Material			Material						
	-Ingestible Material:								
Non									
Sonar and Non	e								
Other									
Transducer									
Bins									
In-Water Non	e								
Explosive									
Bins				-		<u>-</u>			
-	sical Disturbance and Str	r ike: (Section	5.3.4)						
•	sel movement								
Measures									
Assumptions Non	e								
Used for									
Analysis									

A.2.8 MINE WARFARE

Mine warfare is the naval warfare area involving the detection, avoidance, and neutralization of mines to protect Navy ships and submarines and offensive mine laying in naval operations. A naval mine is a self-contained explosive device placed in water to destroy ships or submarines. Naval mines are deposited and left in place until triggered by the approach of an enemy ship or are destroyed or removed. Naval mines can be laid by purpose-built minelayers, other ships, submarines, or airplanes. Mine warfare training includes mine countermeasures exercises and mine-laying exercises.

A.2.8.1 Airborne Mine Countermeasure – Mine Detection

Mine Warfare							
Airborne Mine	Countermeasures – Mine Det	ection					
Short	Helicopter aircrews detect r	nines using towed or	Typical Dura	ation			
Description	laser mine detection system	S.	2 hours				
Long Description	Helicopter aircrews use towed and airborne devices to detect, locate, and classify potential mines. Towed devices employ active acoustic sources, such as high-frequency and side scanning sonar. These devices are similar in function to systems used to map the seafloor or locate submerged structures/items. Airborne devices utilize laser systems to locate mines located below the surface. Devices used include the AN/AQS-20/A, towed mine-hunting sonar used to detect and classify bottom and floating/moored mines in deep and shallow water, and the Airborne Laser Mine Detection System, developed to detect and classify floating and near-surface, moored mines.						
Typical	Platforms: Rotary-wing airc	raft, unmanned vehicles					
Components	Targets: Mine shapes						
	Systems being Trained/Tes		ems				
Standard	Aircraft safety	Typical Locations					
Operating	Unmanned aerial, surface,	Range Complexes/Tes	ting Ranges:	Inland Waters/Pierside:			
Procedures	and subsurface vehicle	Gulf of Mexico	0 1 011	None			
(Section 2.3.3)	safety Towed in-water device	Jacksonville Navy Cherry Point					
	safety						
	Sarcty	Virginia Capes					
		Naval Surface Warfare	-				
		Panama City Divisio					
Stressors to	Acoustic:	Physical Disturbance a		Energy:			
Biological	Sonar and other	Aircraft and aerial targ		In-air electromagnetic			
Resources	transducers	Vessels and in-water d	evices	devices			
	Aircraft noise	Seafloor devices		Lasers			
	Vessel noise	Ingestion:		Entanglement:			
	Explosives:	None		None			
	None	None		None			
Stressors to	Air Quality:	Sedimen	ts and Water	Quality:			
Physical	Criteria air pollutants	None	to and trate.	Quanty.			
Resources	•						
	Habitats:						
	Physical disturbance and stri	ke – seafloor					
	devices						
Stressors to	Cultural Resources:	Socioeconomic Reso	ources:	Public Health and Safety:			
Human	Physical disturbance and	Accessibility		Physical interactions			
Resources	strike	Airborne acoustics		In-air energy			
		Physical disturbance	and strike	Underwater energy			

Mine Warfare	Mine Warfare							
Airborne Mine	Airborne Mine Countermeasures – Mine Detection							
Military	Ingestible Material:	Military	Mine shapes (non-explosive)					
Expended	None	Recoverable						
Material		Material						
	Non-Ingestible Material:							
	None							
Sonar and	High-Frequency:							
Other	HF4							
Transducer								
Bins								
In-Water	None							
Explosive								
Bins								
Procedural	Acoustic Stressors: (Section 5.3.2)	Physica	l Disturbance and Strike: (Section 5.3.4)					
Mitigation	Active sonar	Towed	in-water devices					
Measures								
Assumptions	Sonar mine detection systems towed from helicopters.							
Used for	Airborne laser systems used to detect mine shapes.							
Analysis	Laser systems are similar to commercial Li	ght Detection An	d Ranging (LIDAR) systems. The in-air					
	energy stressor was used in analysis of	potential impact	s on human resources.					
	Mine shapes may be deployed via ship and	d will be recovere	d.					

A.2.8.2 Airborne Mine Countermeasure – Towed Mine Neutralization

Mine Warfare								
Airborne Mine	Countermeasures – Towed M	line Neutralization	on					
Short	Helicopter aircrews tow syst	tems through the	2 1	ypical Dura	ation			
Description	water that are designed to o	disable or trigger		5-4 hours				
	mines.			5-4 nours	iours			
Long	Helicopter vehicle operators	s use towed devi	ces to trigg	er mines th	at are designed to detonate when			
Description	they detect ships/submarine							
	_	• •			floating moored mines. Training			
	may be conducted with non	-explosive trainii	ng mine sha	apes.				
	Devices used include the fol	ollowing: MK 105 sled, which creates a magnetic field used to trigger						
		conjunction with the MK 103 cable cutter system and the MK 104 acoustic						
			ic Orange F	ipe), a mag	gnetic pipe that is used to trigger			
	magnetically influenced min							
Typical	Platforms: Rotary-wing airc	raft						
Components	Targets: Mine shapes							
	Systems being Trained/Tes			tion system	ns			
Standard	Aircraft safety	Typical Locatio	ns					
Operating	Towed in-water device	Range Comple	xes/Testin	g Ranges:	Inland Waters/Pierside:			
Procedures (Section 2.3.3)	safety	Gulf of Mexico		_	None			
(3600001 2.3.3)		Jacksonville						
		Navy Cherry P	oint					
		Virginia Capes						
Stressors to	Acoustic:	Physical Distu			Energy:			
Biological	Aircraft noise	Aircraft and a	_		In-air electromagnetic			
Resources		Vessels and in		ices	devices			
	Explosives:	Seafloor devic	es		In-water electromagnetic			
	None				devices			
		Ingestion: None			Entanglement:			
		None			None			
Stressors to	Air Quality:		Sediments	and Water				
Physical	Criteria air pollutants		None	ana water	Quanty.			
Resources								
	Habitats:							
	Physical disturbance and stri	ike – seafloor						
	devices							
Stressors to	Cultural Resources:	Socioecono		ces:	Public Health and Safety:			
Human	Physical disturbance and	Accessibility			Physical interactions			
Resources	strike	Airborne ac			In-air energy			
		Physical dist			Underwater energy			
Military	Ingestible Material:		/lilitary		shapes (non-explosive)			
Expended	None		ecoverable	•				
Material	Non-Ingestible Material:		/laterial					
	None							
Sonar and	None				•			
Other	HOILE							
Transducer								
Bins								
20								

Mine Warfare	
Airborne Mine	Countermeasures – Towed Mine Neutralization
In-Water Explosive Bins	None
Procedural Mitigation Measures	Physical Disturbance and Strike: (Section 5.3.4) Towed in-water devices
Assumptions Used for Analysis	Mechanical sweeping (cable cutting), acoustic and magnetic influence sweeping devices are towed from helicopters. Cable cutters utilize an insignificant charge (similar to a shotgun shell). Acoustic sweeps generate ship-type noise via a mechanical system. Towing systems though minefields (or without mines, to train to deploy, tow, and recover) may involve instrumented mines. Mine shapes are recovered.

A.2.8.3 Civilian Port Defense – Homeland Security Anti-Terrorism/Force Protection Exercise

Mine Warfare							
Civilian Port De	fense – Homeland Security A	nti-Terrorism/Force Prot	ection Exercis	es			
Short	Maritime security personne	l train to protect	Typical Dura	tion			
Description	civilian ports and harbors ag	gainst enemy efforts to	Naultiala dau	_			
	interfere with access to thos	se ports.	Multiple days				
Long	Naval forces provide mine w						
Description	sponsored exercises. The three pillars of mine warfare, airborne (helicopter), surface (surface ships),						
	and undersea (divers, marine mammals, and unmanned vehicles) mine countermeasures will be						
	brought to bear in order to ensure strategic U.S. ports remain free of mine threats. Various mine warfare sensors, which utilize active acoustics, will be employed in the detection, classification, and						
				ques, such as helicopter towed			
		_		l be utilized. Marine mammal			
	systems may be used during		,				
			a Danartmant	of Hamaland Cocurity stratogic			
	goals and evolving world ev	·	о рерагинени	of Homeland Security strategic			
Typical			upport craft s	urface combatants, unmanned			
Components	underwater vehicles	,					
·	Targets: Mine shapes						
	Systems being Trained/Tes	•	ems, towed mi	ne neutralization systems,			
	airborne mine neutralization systems						
Standard	Vessel safety	Typical Locations					
Operating	Aircraft safety	Range Complexes/Tes	ting Ranges:	Inland Waters/Pierside:			
Procedures	Unmanned aerial, surface, and subsurface vehicle	None	0 0	Beaumont, Texas			
(Section 2.3.3)	safety			Boston, Massachusetts			
	Towed in-water device			Corpus Christi, Texas			
	safety			Delaware Bay, Delaware			
	,			Earle, New Jersey			
				Hampton Roads, Virginia			
				Kings Bay, Georgia Naval Station Mayport, Florida			
Stressors to	Acoustic:	Physical Disturbance a	and Strike:	Energy:			
Biological	Sonar and other	Aircraft and aerial targ		In-water electromagnetic			
Resources	transducers	Underwater explosives		devices			
	Aircraft noise	Vessels and in-water d		In-air electromagnetic			
	Vessel noise	Seafloor devices		devices			
	Explosives:	Ingestion:		Entanglement:			
	Underwater explosives	Military expended mat munitions	erials –	None			
Stressors to	Air Quality:		ts and Water	Quality:			
Physical	Criteria air pollutants	Metals	Explos				
Resources	Titolia ali poliacarito	11100013	LAP103				
	Habitats:						
	Physical disturbance and stri	ike – military					
	expended materials						
	Physical disturbance and stri	ike – seafloor					
	devices						
	Underwater explosives						

Mine Warfare	Mine Warfare						
Civilian Port De	Civilian Port Defense – Homeland Security Anti-Terrorism/Force Protection Exercises						
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike Explosives	Accessibi Airborne	Accessibility Airborne acoustics		Public Health and Safety: Physical interactions In-air energy Underwater energy		
Military Expended Material	Ingestible Material: Mine neutralizer fragments Non-Ingestible Material: None		Military Recoverable Material	Mine sh	napes (non-explosive)		
Sonar and Other Transducer Bins	High-Frequency: HF4	Syntheti SAS2	c Aperture Sonar	s:			
In-Water Explosive Bins	E2 E4						
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3) Active sonar Physical Disturbance and Strike Vessel movement Towed in-water devices	·	Explosiv Nav		ors: (Section 5.3.3) neutralization activities involving		
Assumptions Used for Analysis	Non-permanent mine shapes w Shapes are varied, from about 1 using normal assets, with di Explosives may be used if requi While goal is to conduct once po exercise will occur every oth	1 m circular ver involve red for sche er year, alt	r to about 2.5 m loment. eduled mine neut ernating east/we	ong by 1 in a congression on the congression of the	m wide. They will be recovered n exercises. assume that an east coast		

A.2.8.4 Coordinated Unit-Level Helicopter Airborne Mine Countermeasures Exercise

Mine Warfare						
Coordinated Ur	nit-Level Helicopter Airborne	Mine Counterm	easures E	cercise		
Short	A detachment of helicopters	s aircrews train	as a	Typical D	uration	
Description	unit in the use of airborne m	nine counterme	asures,			
	such as towed mine detection	on and neutraliz	ation	Multiple o	days	
	systems.					
Long					e mine countermeasures. Systems	
Description		nine detection systems, mechanical (cable cutting) mine sweeps, magnet				
	and acoustic mine sweeps, a	and other airbor	ne system	s and sens	ors.	
					e shapes will be supplemented with	
	• •		aced mine	shapes. Tr	raining mine shapes could be	
The section of	bottom placed, moored, or	_				
Typical	Platforms: Rotary-wing airc	raft				
Components	Targets: Mine shapes Systems being Trained/Test	tad: Mine detec	tion system	ns towad	mine neutralization systems	
Standard	Aircraft safety	Typical Location		iis, towed	Time neutralization systems	
Operating	Towed in-water device					
Procedures	safety	Range Comple		ng Ranges		
(Section 2.3.3)		Gulf of Mexicon Jacksonville	0		None	
		Navy Cherry F	Point			
		Virginia Capes				
Stressors to	Acoustic:	Physical Distu		d Strike:	Energy:	
Biological	Sonar and other	Aircraft and a	erial targe	ts	In-air electromagnetic	
Resources	transducers	Vessels and ir		vices	devices	
	Aircraft noise	Seafloor device	ces		In-water electromagnetic	
					devices	
	Explosives: None	Ingestion: Military expe	ndod mate	rials —	Foto a dominate	
	None	munitions		ilais –	Entanglement: Wires and cables	
Stressors to	Air Quality:			s and Wat	er Quality:	
Physical	Criteria air pollutants		Metals	s and wat	er quanty.	
Resources						
	Habitats:					
	Physical disturbance and stri	ike – military				
	expended materials	:l				
	Physical disturbance and stri devices	ike – seafloor				
Stressors to	Cultural Resources:	Socioecono	omic Reso	ırces:	Public Health and Safety:	
Human	Physical disturbance and	Accessibilit			Physical interactions	
Resources	strike	Airborne ad	-		In-air energy	
		Physical dis	sturbance	and strike	Underwater energy	
Military	Ingestible Material:		Military		ne shapes (non-explosive)	
Expended	Medium-caliber projectiles,		Recoverab	le		
Material	caliber casings		Material			
	Non-Ingestible Material:					
	Fiber optic cables, mine sha	pes (non-				
	explosive)	, , , , , , , , , , , , , , , , , , , ,				
	F /					

Mine Warfare					
Coordinated Ur	Coordinated Unit-Level Helicopter Airborne Mine Countermeasures Exercise				
Sonar and	High-Frequency:				
Other	HF4				
Transducer					
Bins					
In-Water	None				
Explosive					
Bins					
Procedural	Acoustic Stressors: (Section 5.3.2)				
Mitigation	Active sonar				
Measures					
	Physical Disturbance and Strike: (Section 5.3.4)				
	Vessel movement				
	Towed in-water devices				
Assumptions	Multiple helicopters conduct airborne mine countermeasure training using an assortment of mine				
Used for	warfare gear similar to unit-level events, except that a squadron trains together.				
Analysis	Assume up to 24 temporary mine shapes will be deployed to support each of these exercises.				

A.2.8.5 Mine Countermeasures – Ship Sonar

Mine Warfare					
Mine Counterm	easure Exercise – Ship Sonar				
Short	Ship crews detect and avoid			Typical D	Ouration
Description	navigating restricted areas of sonar.		g active	1.5-4 hou	
Long Description Typical	Surface ship crews detect and avoid mines or other underwater hazardous objects while navigating restricted areas or channels using active sonar. A Littoral Combat Ship utilizes unmanned surface vehicles and remotely operated vehicles to tow mine detection (hunting) equipment. Systems will operate from a shallow zone greater than 40 ft. to deep water. Exercises could be embedded within major training exercises.				
Components	Platforms: Surface combata Targets: Mine shapes	ints, unimanneu	surface vi	enicies	
•	Systems being Trained/Tes	ted: Sonar syste	ms		
Standard Operating	Vessel safety Unmanned aerial, surface,	Typical Location	ons	ing Range	s: Inland Waters/Pierside:
Procedures (Section 2.3.3)	and subsurface vehicle safety Towed in-water device safety	Gulf of Mexico Jacksonville Virginia Capes)	mg nunge	None
Stressors to	Acoustic:	Physical Distu	ırbance a	nd Strike:	Energy:
Biological Resources	Sonar and other transducers Vessel noise	Vessels and in Seafloor device Ingestion:		evices	In-air electromagnetic devices In-water electromagnetic devices
	Explosives: None	None			Entanglement: None
Stressors to Physical Resources	Air Quality: Criteria air pollutants Habitats: Physical disturbance and stri		Sedimen None	ts and Wa	ter Quality:
<u> </u>	devices				5 11: 11 11 10 f :
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike	Socioecono Accessibility Physical dis	у		Public Health and Safety: Physical interactions In-air energy Underwater energy
Military Expended Material	Ingestible Material: None Non-Ingestible Material: None	F	Military Recoveral Material		ne shapes (non-explosive)
Sonar and Other Transducer Bins	High-Frequency: HF4				
In-Water Explosive Bins	None				_

Mine Warfare	Mine Warfare						
Mine Counterm	Mine Countermeasure Exercise – Ship Sonar						
Procedural	Acoustic Stressors: (Section 5.3.2)	Physical Disturbance and Strike: (Section 5.3.4)					
Mitigation	Active sonar	Vessel movement					
Measures		Towed in-water devices					
Assumptions	No explosives are used.						
Used for	It is assumed that the system will be operate	d in areas free of obstructions and will be towed well					
Analysis	above the seafloor. Towed system are all	ways operated in a manner to avoid entanglement and					
	damage. Exercises take place in water de						
	Existing placed mine shapes to be used. Ther	e is the potential for temporary placement of mine					
	shapes.						

A.2.8.6 Mine Countermeasures – Mine Neutralization – Remotely Operated Vehicle

Mine Warfare						
Mine Counterm	neasures – Mine Neutralizatio	n – Remotely (Operated Ve	hicles		
Short	Ship, small boat, and helicop	oter crews loca	te and	ypical Dura	ation	
Description	disable mines using remotel	y operated		. Г. А. b. с ис.		
	underwater vehicles.	r vehicles.			1.5-4 hours	
Long			-	-	ehicles to neutralize potential	
Description					ems to locate and target mine	
	shapes. Explosive mine neut				vents.	
Typical	Platforms: Rotary-wing airci	raft, small boat	s, surface co	mbatants		
Components	Targets: Mine shapes	tad. Aidbauaa a	المسادية ما ما			
Chandand	Systems being Trained/Test			zation syste	ems, underwater explosives	
Standard	Vessel safety	Typical Locat	ions			
Operating Procedures	Aircraft safety Towed in-water device	Range Comp	lexes/Testin	g Ranges:	Inland Waters/Pierside:	
(Section 2.3.3)	safety	Gulf of Mexi	со		None	
(3000.077 2.3.3)	Sarcey	Jacksonville				
		Navy Cherry				
		Virginia Cape				
Stressors to	Acoustic:	Physical Dist			Energy:	
Biological Resources	Aircraft noise Vessel noise	Aircraft and	_	5	In-air electromagnetic	
Resources	vesserrioise	Underwater explosives devices Vessels and in-water devices				
	Explosives:	Military expe			Entanglement:	
	Underwater explosives	Seafloor dev			Wires and cables	
	'					
		Ingestion:				
		Military expe	ended mater	ials –		
		munitions				
Stressors to	Air Quality:		Sediments			
Physical	Criteria air pollutants		Explosives	N	1etals	
Resources	Habitats:					
	Physical disturbance and stri	ke – military				
	expended material	ic illineary				
	Physical disturbance and stri	ke – seafloor				
	devices					
	Underwater explosives					
Stressors to	Cultural Resources:	Socioecon	omic Resou	rces:	Public Health and Safety:	
Human		Accessibili	•		Physical interactions	
Resources	Physical disturbance and	Airborne a	In-air energy			
	strike Physical disturbance and strike Underwater ener					
Battite	Explosives	<u> </u>	B 4:1:4 -			
Military	Ingestible Material:		Military Recoverable		shapes (non-explosive)	
Expended Material	Mine neutralizer fragments		Material			
Material	Non-Ingestible Material:		.viacci iai			
	Fiber optic cables					
	•					

Mine Warfare		
Mine Counterm	neasures – Mine Neutralization – Remotely Operat	ed Vehicles
Sonar and	High-Frequency:	
Other	HF4	
Transducer		
Bins		
In-Water	E4	
Explosive		
Bins		
Procedural	Acoustic Stressors: (Section 5.3.2)	Explosive Stressors: (Section 5.3.3)
Mitigation	Active sonar	Explosive mine countermeasure and
Measures		neutralization activities
	Physical Disturbance and Strike: (Section 5.3.4)	
	Vessel movement	
	Towed in-water devices	
Assumptions	None	
Used for		
Analysis		

A.2.8.7 Mine Laying

Mine Warfare						
Mine Laying						
Short	Fixed-winged aircraft drop n	on-explosive mi	ne	Typical Dura	ation	
Description	shapes.	ion explosive iii	''` `	1 hour		
				Ladvantage for friendly forces		
Long Description	Fixed-winged aircraft lay offensive or defensive mines for a tactical advantage for friendly forces. Fixed-winged aircraft lay a precise minefield pattern for specific tactical situations. The aircrew					
Description		ypically makes multiple passes in the same flight pattern, and drop one or more training shapes				
		ss (four shapes total). Training shapes are non-explosive and are recovered when possible.				
Trustant			are non-	explosive and	a are recovered when possible.	
Typical	Platforms: Fixed-wing aircra	IIL				
Components	Targets: None	tad. Nana				
<u> </u>	Systems being Trained/Test					
Standard	Aircraft safety	Typical Location	ons			
Operating		Range Comple	xes/Testi	ing Ranges:	Inland Waters/Pierside:	
Procedures		Jacksonville		0 - 0	None	
(Section 2.3.3)		Navy Cherry Po	oint			
		Virginia Capes				
Stressors to	Acoustic:	Physical Distu		nd Strike:	Energy:	
Biological	Aircraft noise	Aircraft and a			In-air electromagnetic	
Resources	7 in crare moise	Military expen	_		devices	
Resources	Explosives:	Seafloor devic		211013	devices	
	None	Scarioor acvic			Entanglement:	
	None	Ingestion:			None	
		None			None	
Stressors to	Air Quality:		Sadimant	s and Water	Quality:	
Physical	Criteria air pollutants		Metals	s and water	Quanty.	
Resources	Criteria ali poliutarits	'	ivictais			
Resources	Habitats:					
	Physical disturbance and stri	ike – seafloor				
	devices	ike seamoor				
Stressors to	Cultural Resources:	Socioecono	mic Reso	iirces.	Public Health and Safety:	
Human	Physical disturbance and	Accessibility		u. 005.	Physical interactions	
Resources	strike	Airborne ac			In-air energy	
1100001000	Strike	Physical dist		and strike	iii diii ciicigy	
Military	Ingestible Material:	· ·	/lilitary		shapes (non-explosive)	
Expended	None	_	Recoverab		shapes (non explosive)	
Material	None		/laterial	,,,,		
Widterial	Non-Ingestible Material:		, acciiai			
	Mine shapes (non-explosive))				
Sonar and	None	,				
Other	140nc					
Transducer						
Bins						
In-Water	None			<u>-</u>	.	
	None					
Explosive Bins						
	Dhusiaal Disturbs 10:		2.41			
Procedural	Physical Disturbance and St		3.4)			
Mitigation	Non-explosive bombs and m	ine shapes				
Measures						

Mine Warfare	Mine Warfare					
Mine Laying						
Assumptions	Mine laying is similar to non-explosive bombing exercises.					
Used for	These exercises primarily occur during major training exercises.					
Analysis	While some mine shapes will be recovered if possible, assume they will not for the analysis.					
	Mine laying will typically take place in waters less than 100 ft. in depth.					
	Assume 12 mine shapes are used per exercise.					

A.2.8.8 Mine Neutralization – Explosive Ordnance Disposal

Mine Warfare						
	ation Explosive Ordnance Disp	nosal				
Short			osivo Tvi	oical Duration		
Description	Personnel disable threat min charges.	ies using expi		to 4 hours		
-	Navy divers, typically explosive ordnance disposal personnel, disable threat mines with explosive					
Long						
Description	charges to create a safe channel for friendly vessels to transit.					
	Personnel detect, identify, e	valuate, and r	neutralize mines	in the water with an explosive device and		
	may involve detonation of o	ne or more ex	plosive charges	from 4 to 60 pounds of TNT equivalent.		
	These operations are norma	Illy conducted	during daylight	hours for safety reasons.		
	Time-delay fuses may be use	ed for these e	xercises.			
Typical	Platforms: Small boats					
Components	Targets: Mine shapes					
	Systems being Trained/Test	ted: Underwa	ter explosives			
Standard	Vessel safety	Typical Loca	tions			
Operating Procedures		Range Com	plexes/Testing	Ranges: Inland Waters/Pierside:		
(Section 2.3.3)		Gulf of Mex	ico	Lower Chesapeake Bay		
(30000011 2.3.3)		Jacksonville				
		Key West				
		Navy Cherry				
		Virginia Cap				
Stressors to	Acoustic:		turbance and S			
Biological	Vessel noise	Underwater	•	None		
Resources			in-water device			
	Explosives:		ended material	-		
	Underwater explosives	Seafloor de	vices	None		
		Ingestion:				
		Military exp	ended material	s –		
		munition	ıs			
Stressors to	Air Quality:			nd Water Quality:		
Physical	Criteria air pollutants		Explosives	Metals		
Resources						
	Habitats:					
	Physical disturbance and stri	ike – military				
	expended material					
	Physical disturbance and stri	ike – seafloor				
	devices					
Chuana na ha	Underwater explosives	Casiasas	manaia Danassuna	Dublic Health and Cafety.		
Stressors to Human	Cultural Resources:	Accessibi	nomic Resource			
Resources	Physical disturbance and	Accessibi	•	Physical interactions Underwater energy		
Resources	strike		disturbance and			
	Explosives	i nysical C	aistai bailte alla	Strike		
Military	Ingestible Material:		Military	Mine shapes (non-explosive)		
Expended	Mine shape (explosive) fragi	ments	Recoverable	Time shapes (non explosive)		
Material	e shape (explosive) hagi		Material			
	Non-Ingestible Material:					
	None					
	- 11 =					

Mine Warfare								
Mine Neutraliza	Mine Neutralization Explosive Ordnance Disposal							
Sonar and	None							
Other								
Transducer								
Bins								
In-Water	E4 E5	E6	E7					
Explosive								
Bins								
Procedural	Acoustic Stressors: (Section 5.3.2))	Explosive Stressors: (Section 5.3.3)					
Mitigation	Aircraft overflight noise		Explosive mine neutralization activities involving					
Measures			Navy divers					
	Physical Disturbance and Strike:	(Section 5.3.4)						
	Vessel movement							
Assumptions	Time-delayed fuses may be used	(up to 10 minu	tes) for charges up to 29 lb. net explosive weight in					
Used for	some locations. Charge placed	d anywhere in v	vater column, including bottom.					
Analysis	Mine shapes will be recovered.							

A.2.8.9 Underwater Mine Countermeasure Raise, Tow, Beach and Exploitation Operations

Mine Warfare					
Underwater Mi	ne Countermeasure Raise, To	ow, Beach and Exploitatio	n Operations		
Short	Personnel locate mines, per	form mine	Typical Dura	ition	
Description	neutralization, raise and to				
	and conduct exploitation or	perations for	Up to 4 hour	rs	
	intelligence gathering.				
Long	Navy divers, typically explos	sive ordnance disposal per	sonnel, locate	e mines using unmanned	
Description	underwater vehicle, marine	mammals, or other diver	ques. Mines are then neutralized,		
	_			ce disposal personnel ensure the	
		· ·		ing to the beach. A lift balloon is	
	attached to the line and slo			The state of the s	
		tifying the mine and how i	t works, and t	then disassembling it or disposing	
	of it.				
Typical	Platforms: Small boats				
Components	Targets: Mine shapes				
<u> </u>	Systems being Trained/Tes				
Standard	Vessel safety	Typical Locations			
Operating Procedures		Range Complexes/Testi	ing Ranges:	Inland Waters/Pierside:	
(Section 2.3.3)		Gulf of Mexico		James River and tributaries	
(30000011 2.3.3)		Jacksonville		Lower Chesapeake Bay	
		Key West		Mobjack Bay	
		Navy Cherry Point		Dam Neck Annex	
		Virginia Capes		Camp Pendleton	
				Joint Expeditionary Base Little	
				Creek Harbor	
				Joint Expeditionary Base Fort	
				Story Naval Station Norfolk pier	
				Cheatham Annex pier	
				York River	
				Naval Submarine Base Kings	
				Bay (St. Mary's River)	
Stressors to	Acoustic:	Physical Disturbance ar	nd Strike:	Energy:	
Biological	Vessel noise	Vessels and in-water de		None	
Resources		Seafloor devices			
	Explosives:			Entanglement:	
	None	Ingestion:		None	
		None			
Stressors to	Air Quality:	Sediments and Water Quality:			
Physical	Criteria air pollutants	None			
Resources					
	Habitats:				
	Physical disturbance and str	ike – seafloor			
Character	devices	Carlana I D		Dublic Health at 10.6	
Stressors to	Cultural Resources:	Socioeconomic Reso	urces:	Public Health and Safety:	
Human	Physical disturbance and strike	Accessibility Airborne acoustics		Physical interactions	
Resources	Strike		and strike		
		Physical disturbance	anu Suike		

Mine Warfare	Mine Warfare					
Underwater Mi	Underwater Mine Countermeasure Raise, Tow, Beach and Exploitation Operations					
Military	Ingestible Material:	Military	Mine shapes (non-explosive)			
Expended	None	Recoverable				
Material		Material				
	Non-Ingestible Material:					
	None					
Sonar and	None					
Other						
Transducer						
Bins						
In-Water	None					
Explosive						
Bins						
Procedural	Physical Disturbance and Strike: (Section	Physical Disturbance and Strike: (Section 5.3.4)				
Mitigation	Vessel movement					
Measures						
Assumptions	Exercises primarily conducted in W-50 in Virginia Capes Range Complex and beaches at Dam Neck					
Used for	Annex.					
Analysis	Mine shapes are recovered as part of the	exercise.				

A.2.9 SURFACE WARFARE TRAINING

Surface warfare is a type of naval warfare in which aircraft, surface ships, and submarines employ weapons and sensors in operations directed against enemy surface ships or small boats. Aircraft-to-surface warfare is conducted by long-range attacks using air-launched cruise missiles, precision-guided munitions, or aircraft cannon. Surface warfare also is conducted by warships employing torpedoes, naval guns, and surface-to-surface missiles. Submarines attack surface ships using torpedoes or submarine-launched, anti-ship cruise missiles. Training in surface warfare includes surface-to-surface gunnery and missile exercises, air-to-surface gunnery and missile exercises, and submarine missile or torpedo launch events. Gunnery and missile training generally involves expenditure of ordnance against a towed target. A sinking exercise is a specialized training exercise that provides an opportunity for ship, submarine, and aircraft crews to use multiple weapons systems to deliver high-explosive ordnance on a deactivated vessel, which is deliberately sunk.

Surface warfare also encompasses maritime security, that is, the interception of a suspect surface ship by a Navy ship for the purpose of boarding-party inspection or the seizure of the suspect ship. Training in these tasks is conducted in visit, board, search and seizure exercises.

A.2.9.1 Bombing Exercise Air-to-Surface

Surface Warfar	e					
Bombing Exerci	ng Exercise Air-to-Surface					
Short Description	Fixed-wing aircrews deliver targets.	bombs against surface	Typical Duration 1 hour			
Long Description	Fixed-wing aircraft conduct bombing exercises against stationary floating targets (e.g., MK-58 smoke buoy), towed targets, or maneuvering targets. An aircraft clears the area, deploys a smoke buoy, and then delivers high-explosive or non-explosive practice bombs on the target. A range boat may be used to deploy towed or maneuvering targets for an aircraft to attack. Exercises for strike fighters typically involve a flight of two aircraft delivering unguided or guided munitions that may be either high-explosive or non-explosive. The following munitions may be employed by strike fighter aircraft in the course of bombing exercise: Unguided munitions including non-explosive subscale bombs (MK-76 and BDU-45), explosive and non-explosive general purpose bombs (MK-80 series), and MK-20 cluster bombs (explosive, non-explosive). Precision-guided munitions include laser-guided bombs (explosive, non-explosive), laser-guided training rounds (non-explosive), Joint Direct Attack Munitions (explosive, non-explosive).					
Typical Components	Platforms: Fixed-wing aircraft, support craft Targets: Surface targets Systems being Trained/Tested: Bombs, non-explosive practice munitions, aircraft platforms					
Standard Operating Procedures (Section 2.3.3)	Vessel safety Aircraft safety Weapons firing safety	Typical Locations Range Complexes/Tes Gulf of Mexico Jacksonville Navy Cherry Point Virginia Capes	sting Ranges: Inland Waters/Pierside: None			

Surface Warfar	e				
Bombing Exerc	ise Air-to-Surface				
Stressors to	Acoustic:	Physical Dis	turbance and Str	ike: E	Energy:
Biological	Aircraft noise		aerial targets	Į.	n-air electromagnetic
Resources	Vessel noise	Underwater	•		devices
			in-water devices		
		Military exp	ended materials		Intanglement:
	Explosives:				Decelerators/parachutes
	Underwater explosives	Ingestion:			
			ended materials	_	
		munition		- 41	
		than mu	ended materials	– otner	
Chungana ta	Ain Ouglitus	than mu	-	Water Overlin	
Stressors to	Air Quality:		Sediments and	Metals	.y:
Physical Resources	Criteria air pollutants		Explosives	ivietais	
Resources	Habitats:				
	Physical disturbance and strik	e – military			
	expended material	c mineary			
	Underwater explosives				
Stressors to	None				
Human					
Resources					
Military	Ingestible Material:		Military	Recoverable	surface targets
Expended	Decelerators/parachutes, targ	get	Recoverable		
Material	fragments, bomb (explosive	e)	Material		
	fragments				
	Non-Ingestible Material:				
	Marine markers, bombs (non-	-explosive)			
Sonar and	None				
Other					
Transducer Bins					
_	E9 E10	Е1	า		
In-Water Explosive	L E E E E E E E E E E E E E E E E E E E	E1	4		
Bins					
Procedural	Physical Disturbance and Stri	ke: (Section	5.3.4) Explosi	e Stressors: /	(Section 5.3.3)
Mitigation	Vessel movement			e bombs	Jeetieii 3.3.3,
Measures	Non-explosive bombs and mir	ne shapes			
Assumptions	Approximately 90 percent of		e bombs are the s	sub-scale bom	bs such as the MK-76 and
Used for	BDU-48.	I			
Analysis	Stressors to human resources	were not an	alyzed for this ac	tivity since it o	occurs greater than 12 NM
	from shore.				

A.2.9.2 Fast Attack Craft and Fast Inshore Attack Craft

Surface Warfar	e					
	ft and Fast Inshore Attack Cra	ft				
Short	Navy ships and helicopters of		et small	Tynical	Duration	
Description	boat attacks.	iciciia agains	ot siliali	2-4 hou		
Long						
Description	Navy ships and helicopters detect, coordinate, and defend against multiple high speed small boats employing swarm tactics. Ships must coordinate defenses to achieve proper targeting of attack craft.					
Description	Only blank ordnance is used in this activity. Activities conducted in the open ocean are called Fast					
	Attack Craft, while those in littoral waters are called Fast Inshore Attack Craft.					
Typical	Platforms: Amphibious warfare ships, surface combatants, rotary-wing aircraft					
Components	Targets: None					
	Systems being Trained/Test	t ed: None				
Standard	Vessel safety	Typical Loca	ations			
Operating	Aircraft safety					
Procedures	Weapons firing safety	_	plexes/Test	ting Rang		
(Section	and a substituting sures,	Jacksonville			Naval Station Mayport basin and	
2.3.3)		Virginia Ca _l	oes		piers	
Stressors to	Acoustic:	Physical Di	sturbance a	nd Strike	e: Energy:	
Biological	Aircraft noise		d in-water d		In-air electromagnetic	
Resources	Vessel noise		d aerial targ		devices	
	Weapons noise					
		Ingestion:			Entanglement:	
	Explosives:	Military exp	pended mat	erials –	Decelerators/parachutes	
	None	munitions				
Stressors to	Air Quality:	Sediments and Water Quality:				
Physical	Criteria air pollutants	Metals				
Resources						
	Habitats:					
	Physical disturbance and strike – military					
	expended material				218 11 12 12 12 12	
Stressors to	Cultural Resources:		nomic Reso	ources:	Public Health and Safety:	
Human	Physical disturbance and	Accessib	acoustics		Physical interactions	
Resources	strike		disturbance	and strik	In-air energy	
Militory	Ingestible Material:	Filysical	Military			
Military Expended	Small-caliber projectiles (cas	ings only)	Recovera		one	
Material	Sinali-caliber projectiles (cas	iligs Offiy)	Material	DIE		
Wiaterial	Non-Ingestible Material:		Wiaterial			
	None	<u>-</u>				
Sonar and	None					
Other						
Transducer						
Bins						
In-Water	None					
Explosive						
Bins						
Procedural	Physical Disturbance and St	rike: (Section	5.3.4)			
Mitigation	Vessel movement					
Measures	Small-, medium-, and large-o	caliber non-				
	explosive practice muniti	ons				
	•					

Surface Warfar	re
Fast Attack Cra	ft and Fast Inshore Attack Craft
Assumptions	None
Used for	
Analysis	

A.2.9.3 Gunnery Exercise Air-to-Surface Medium-Caliber

Surface Warfard	9						
Gunnery Exercis	se Air-to-Surface Medium-Cal	iber					
Short	Fixed-wing and helicopter ai	ircrews fire medium-	Typical Dura	tion			
Description	caliber guns at surface targe	ets.	1 hour				
Long Description	Fighter and helicopter aircrews engage surface targets with medium-caliber guns. Targets simulate enemy ships, boats, swimmers, and floating/near- surface mines. Fighter aircraft descend on a target firing high-explosive or non-explosive practice munitions medium-caliber projectiles.						
	Helicopters will fly a racetrack pattern around an at-sea target. Aircrew will engage the target with medium-caliber weapons. Targets range from a smoke float, or an empty steel drum, to high speed remote controlled boats and jet-skis.						
Typical	Platforms: Fixed-wing aircra	ift, rotary-wing aircraft					
Components	Targets: Surface targets (e.g., MK 58 marine markers, empty steel drums, high speed remote controlled boats and jet-skis)						
	Systems being Trained/Test	ted: Medium-caliber gun	systems				
Standard	Vessel safety	Typical Locations					
Operating Procedures	Aircraft safety Weapons firing safety	Range Complexes/Tes	ting Ranges:	Inland Waters/Pierside:			
(Section 2.3.3)		Gulf of Mexico None Jacksonville					
		Navy Cherry Point					
		Virginia Capes					
Stressors to	Acoustic:	Physical Disturbance a		Energy:			
Biological	Aircraft noise	Aircraft and aerial targ		In-air electromagnetic			
Resources	Vessel noise	Vessels and in-water d Military expended mat		energy			
	Explosives:	De minimis explosives		Entanglement:			
	De minimis explosives	Ingestion:		Decelerators/parachutes			
		Military expended mat munitions	erials –				
		Military expended mat	erials – other				
		than munitions	eriais other				
Stressors to	Air Quality:	-	t and Water Q	uality:			
Physical Resources	Criteria air pollutants	Metals					
	Habitats: Physical disturbance and stri expended material	al disturbance and strike – military					
Stressors to	None						
Human							
Resources							

Surface Warfar	e				
Gunnery Exerci	se Air-to-Surface Medium-Caliber				
Military Expended Material	Ingestible Material: Decelerators/parachutes, medium- caliber projectiles (non-explosive), medium-caliber casings, target fragments Non-Ingestible Material: Marine markers	Military Recoverable Material	Recoverable surface targets		
Sonar and Other Transducer Bins	None				
In-Water Explosive Bins	None				
Procedural Mitigation Measures	Physical Disturbance and Strike: (Section 5.3.4) Vessel movement Small-, medium-, and large-caliber non-explosive practice munitions Explosive Stressors: (Section 5.3.3) Explosive Medium-caliber and large-caliber projectiles				
Assumptions Used for Analysis	Most medium-caliber air-to-surface gunne High-explosive rounds will supplement Fixed-wing projectile casings remain wexpended into the water. Two fixed-wing aircraft (400 rounds each) One target used per exercise; expendable or remote-controlled targets (5 percent De minimis explosives used during this act included under munitions. Stressors to human resources were not an from shore.	when non-explo ith aircraft and ro or one helicopter smoke floats (50 it). ivity are not quar	sive training projectiles are not available. ptary-wing projectile casings are (400 rounds) per activity. percent), stationary targets (45 percent), ntitatively analyzed and, therefore, not		

A.2.9.4 Gunnery Exercise Air-to-Surface Small-Caliber

Surface Warfare	e						
Gunnery Exercis	se Air-to-Surface Small-Calibe	er					
Short	Helicopter and tiltrotor airci	ews, use smal	l-caliber	Typical	Duration		
Description	guns to engage surface targ			1 hour			
Long	Helicopters and tiltrotor aird	craft, fly a race	track patte	rn aroun	d an at-sea target. Targets simulate		
Description	To the second se	d floating/near-surface mines. Each gunner will engage the targe					
	caliber weapons. Targets rai	nge from a sm	oke float, a	n empty	steel drum, to high speed remote		
	controlled boats and jet-skis	5.					
Typical	Platforms: Rotary-wing airc	ets (e.g., MK 58 marine markers, empty steel drums, high speed remote					
Components	Targets: Surface targets (e.g						
	controlled boats and jet-skis	5					
	Systems being Trained/Tes	ted: None					
Standard	Vessel safety	Typical Loca	tions				
Operating	Aircraft safety	Range Comp	aleves/Test	ing Rang	es: Inland Waters/Pierside:		
Procedures	Weapons firing safety	Jacksonville	JICACS/ ICSC	iiig italig	None		
(Section 2.3.3)		Navy Cherry	Point		None		
		Virginia Cap					
Stressors to	Acoustic:	Physical Dis		nd Strike	: Energy:		
Biological	Aircraft noise	Aircraft and			In-air electromagnetic		
Resources	Vessel noise	Vessels and			devices		
		Military exp	ended mate	erials			
	Explosives:	, ,			Entanglement:		
	None	Ingestion:			Decelerators/parachutes		
		Military exp	ended mate				
		munitions Military expended materials – other					
		than mur	nitions				
Stressors to	Air Quality:		Sediment	ts and W	ater Quality:		
Physical	Criteria air pollutants		Metals				
Resources							
	Habitats:						
	Physical disturbance and stri	ke – military					
	expended material						
Stressors to	Cultural Resources:		nomic Reso 	urces:	Public Health and Safety:		
Human	Physical disturbance and	Accessibil	=		Physical interactions		
Resources	strike	Airborne	isturbance	and strik	In-air energy		
Nilitory	Ingestible Meterial:	Pilysical u	Military		ecoverable surface targets		
Military Expended	Ingestible Material: Decelerators/parachutes, sn	nall calibor	Recoverab		ecoverable surface targets		
Material	projectiles (non-explosive		Material	Jie			
iviateriai			Wiateriai				
	caliber casings, target fragments						
	Non-Ingestible Material:						
	Marine markers						
Sonar and	None	Į.					
Other							
Transducer							
Bins							
In-Water	None						

Surface Warfar	e
Gunnery Exerci	se Air-to-Surface Small-Caliber
Explosive Bins	
Procedural	Physical Disturbance and Strike: (Section 5.3.4)
Mitigation	Vessel movement
Measures	Small-, medium-, and large-caliber non-explosive
	practice munitions
Assumptions	Most exercises will occur proximate to naval stations where MH-60 helicopters are home based and
Used for	target services are available.
Analysis	

A.2.9.5 Gunnery Exercise Surface-to-Surface Boat Medium-Caliber

Short Small boat crews fire medium-caliber guns at surface targets. 1 hour
Small boat crews fire medium-caliber guns at surface targets. Boat crews may use high or low speeds to approach and engage targets simulating other boats, floating mines, or nearshore land targets with medium-caliber (up to and including 40 mm) weapons. A commonly used target is are empty steel drum. A number of different types of boats are used depending on the unit using the boat and their mission. Boats are most used to protect ships in harbors and high value units, such as: aircraft carriers, nuclear submarines, liquid natural gas tankers, etc., while entering and leaving ports, as well as to conduct riverine operations and various naval special warfare operations. The boats use by these units include small unit river craft, combat rubber raiding craft, rigid-hull inflatable boats patrol craft, and many other versions of these types of boats. These boats use inboard or outboat diesel or gasoline engines with either propeller or water jet propulsion.
Long Description Small boat crews fire medium-caliber guns at surface targets. Boat crews may use high or low speeds to approach and engage targets simulating other boats, floating mines, or nearshore land targets with medium-caliber (up to and including 40 mm) weapons. A commonly used target is an empty steel drum. A number of different types of boats are used depending on the unit using the boat and their mission. Boats are most used to protect ships in harbors and high value units, such as: aircraft carriers, nuclear submarines, liquid natural gas tankers, etc., while entering and leaving ports, as well as to conduct riverine operations and various naval special warfare operations. The boats use by these units include small unit river craft, combat rubber raiding craft, rigid-hull inflatable boats patrol craft, and many other versions of these types of boats. These boats use inboard or outboat diesel or gasoline engines with either propeller or water jet propulsion.
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Typical Platforms: Small boats
Components Targets: Surface targets (e.g., empty steel drums)
Systems being Trained/Tested: Medium-caliber gun systems
Standard Vessel safety Typical Locations
Operating Weapons firing safety Range Complexes/Testing Ranges: Inland Waters/Pierside:
Procedures None
(Section 2.3.3) Jacksonville
Navy Cherry Point
Northeast
Virginia Capes
Stressors to Acoustic: Physical Disturbance and Strike: Energy:
Biological Vessel noise Underwater explosives None
Resources Weapons noise Vessels and in-water devices
Military expended materials Entanglement:
Explosives: None
Underwater explosives Ingestion:
Military expended material – other
than munitions
Stressors to Air Quality: Sediments and Water Quality:
Physical Criteria air pollutants Explosives Metals
Resources Habitats:
Physical disturbance and strike – military
expended materials
Underwater explosives
Stressors to Cultural Resources: Socioeconomic Resources: Public Health and Safety:
Human Physical disturbance and Accessibility Physical interactions
Resources strike Airborne acoustics Underwater energy
Explosives Physical disturbance and strike

Surface Warfar	e		
Gunnery Exerci	se Surface-to-Surface Boat Medium-Calibe	r	
Military Expended Material	Ingestible Material: Medium-caliber projectile (explosive) fragments, medium-caliber casings, target fragments Non-Ingestible Material:	Military Recoverable Material	None
	Expendable targets		
Sonar and Other Transducer Bins	None		
In-Water Explosive Bins	E1		
Procedural Mitigation Measures	Physical Disturbance and Strike: (Section Vessel movement Small-, medium-, and large-caliber non-expractice munitions	Explosi	ive Stressors: (Section 5.3.3) ve medium-caliber and large-caliber jectiles
Assumptions Used for Analysis	Approximately 500 rounds expended per One target used per exercise, typically a s		uch as a 50-liter steel drum.

A.2.9.6 Gunnery Exercise Surface-to-Surface Boat Small-Caliber

Surface Warfare	e						
Gunnery Exercis	se Surface-to-Surface Boat Sn	nall-Caliber					
Short	Small boat crews fire small-	caliber guns at	surface	Typica	l Durat	ion	
Description	targets.			1 hour			
Long	Small boat crews fire small-o	all-caliber guns at surface targets. Boat crews may use high or low speeds to					
Description		roach and engage targets simulating other boats, swimmers, floating mines, or nearshore land					
	_	gets with small-caliber (up to and including 0.50 caliber) weapons. A commonly used target is an					
	empty steel drum.						
	A number of different types	of boats are u	ised depen	ding on t	the uni	t using the boat and their	
	mission. Boats are most use	-	-		_		
		-	_			entering and leaving ports, as	
		•		-		fare operations. The boats used	
	-				_	craft, rigid-hull inflatable boats, boats use inboard or outboard,	
	diesel or gasoline engines w						
Typical	Platforms: Small boats			, o c p	- - 051	-	
Components	Targets: Surface targets (e.g	., empty steel	drums)				
	Systems being Trained/Test	ted: None					
Standard	Vessel safety	Typical Loca	tions				
Operating	Weapons firing safety	Range Com	olexes/Test	ing Ran	ges:	Inland Waters/Pierside:	
Procedures		Gulf of Mex			0	None	
(Section 2.3.3)		Jacksonville					
		Navy Cherry	/ Point				
		Northeast					
		Virginia Cap					
Stressors to	Acoustic: Vessel noise	Physical Dis Vessels and			e:	Energy: None	
Biological Resources	Weapons noise	Military exp				None	
Resources	Weapons noise	willitary exp	chaca mat	Criais		Entanglement:	
	Explosives:	Ingestion:				None	
	None	Military exp	ended mat	erials –			
		munition	ıs				
Stressors to	Air Quality:		Sedimen	ts and W	Vater O	Quality:	
Physical	Criteria air pollutants		Metals				
Resources	Habitats:						
	Physical disturbance and stri	ke – military					
	expended material	ne mineary					
Stressors to	Cultural Resources:	Socioeco	nomic Reso	urces:		Public Health and Safety:	
Human	Physical disturbance and	Accessibil	lity			Physical interactions	
Resources	strike	Airborne					
		Physical c	listurbance		-		
Military	Ingestible Material:	,	Military		None		
Expended Material	Small-caliber (non-explosive projectiles, small-caliber c		Recovera Material	bie			
Waterial	projectiles, siliali-camper c	usiligs	Wiaterial				
	Non-Ingestible Material:						
	Expendable targets						

Surface Warfar	e
Gunnery Exerci	se Surface-to-Surface Boat Small-Caliber
Sonar and	None
Other	
Transducer	
Bins	
In-Water	None
Explosive	
Bins	
Procedural	Physical Disturbance and Strike: (Section 5.3.4)
Mitigation	Vessel movement
Measures	Small-, medium-, and large-caliber non-explosive
	practice munitions
Assumptions	The majority of exercises will occur proximate to naval stations.
Used for	Exercises will occur relatively nearshore due to short range of boats and safety concerns. Exercises
Analysis	mostly occur within 3 NM of the shoreline, but can occur further from shore.

A.2.9.7 Gunnery Exercise Surface-to-Surface Ship Large-Caliber

Surface Warfar	e					
	se Surface-to-Surface Ship – L	arge-Caliber				
Short	Surface ship crews fire large	-caliber guns at	Typical Duration	า		
Description	surface targets.		Up to 3 hours			
Long	This exercise involves ships'	gun crews engaging surf	ace targets at sea	with their main battery large-		
Description	caliber (typically 57 mm and	5-inch) guns. Targets in	clude the QST-35 s	seaborne powered target, high		
	speed maneuverable surface		_	ontrolled watercraft. Some		
	targets are expended during the exercise and are not recovered. The exercise proceeds with the target boat approaching from about 10-NM distance. The target is tracked by radar and when within a predetermined range, it is engaged first with large-caliber "warning shots." As threats get closer all weapons may be used to disable the threat.					
	This exercise may involve a sexercise involving multiple s			ontext of a coordinated larger		
	Large-caliber guns will also be weapon maintenance.	oe fired during weapon o	ertification events	and in conjunction with		
	During all exercises, either high-explosive or non-explosive rounds may be used. High-explosive rounds can either be fused for detonation on impact (with water surface or targets), or for proxito the target (in air detonation).					
Typical	Platforms: Surface combata	nts				
Components				speed maneuverable surface		
	targets, or specially configured remote controlled water craft)					
• •	Systems being Trained/Test		stems			
Standard	Vessel safety Weapons firing safety	Typical Locations				
Operating Procedures	Weapons ming salety	Range Complexes/Tes	ting Ranges: In	land Waters/Pierside:		
(Section 2.3.3)		Gulf of Mexico	N	one		
, ,		Jacksonville				
		Navy Cherry Point				
		Virginia Capes Other AFTT Areas				
Stressors to	Acoustic:	Physical Disturbance	and Strike:	Energy:		
Biological	Vessel noise	Underwater explosive		In-air electromagnetic		
Resources	Weapons noise	Vessels and in-water of		devices		
	·	Military expended ma	erials			
	Explosives:			Entanglement:		
	Underwater explosives	Ingestion:		None		
		Military expended ma	:erials –			
		munitions	raviala athau			
		Military expended ma- than munitions	eriais – other			
Stressors to	Air Quality:		its and Water Qua			
Physical Resources	Criteria air pollutants	Explosive		-		
	Habitats:					
	Physical disturbance and stri	ke – military				
	expended materials					
	1					
	Underwater explosives					

Surface Warfar	e		
Gunnery Exerci	se Surface-to-Surface Ship – Large-Caliber		
Human Resources			
Military	Ingestible Material:	Military	Recoverable surface targets
Expended	Target fragments, large-caliber	Recoverable	
Material	projectile (explosive) fragments	Material	
	Non-Ingestible Material:		
	Large-caliber projectiles (non-		
	explosive), large-caliber casings		
Sonar and	None		
Other			
Transducer			
Bins		<u>-</u>	
In-Water	E3 E5		
Explosive			
Bins	A .: 6: (6 /: 5.2.2)		(6. 11. 5.2.2)
Procedural	Acoustic Stressors: (Section 5.3.2)		ve Stressors: (Section 5.3.3)
Mitigation Measures	Weapons firing noise		ve medium-caliber and large-caliber jectiles
Wicasares	Physical Disturbance and Strike: (Section)		cettes
	Vessel movement	,	
	Small-, medium-, and large-caliber non-ex	plosive	
	practice munitions		
Assumptions		plosive rounds ar	e fused to detonate upon impact with the
Used for	water surface or target.		
Analysis	After impacting the water, the high-explosion surface. Non-explosive rounds and frag		
	· · · · · · · · · · · · · · · · · · ·		nts from the high-explosive rounds will
	sink to the bottom of the ocean.	and magnic	the man explosive rounds will
	Assume each non-explosive projectile will	be up to 5 in. in o	diameter and 30 in. in length, and each
	firing will also expend a metallic sleeve	•	=
	Stressors to human resources were not an	alyzed for this ac	tivity since it occurs greater than 12 NM
	from shore.		

A.2.9.8 Gunnery Exercise Surface-to-Surface Ship Medium-Caliber

Surface Warfar	e				
	se Surface-to-Surface Ship Mo	edium-Caliber			
Short	Surface ship crews fire med	ium-caliber guns at	Typical Dura	ation	
Description	surface targets.		2-3 hours		
Long	Surface ship crews fire med	ium-caliber guns at surfa	ce targets.		
Description	Ships use medium-caliber w	eapons to practice defen	sive marksma	nship, typically against a	
	• · · · · · · · · · · · · · · · · · · ·			ato]) and high-speed mobile	
	targets. Some targets are ex	pended during the exerc	ise and are no	t recovered.	
	Shipboard protection system	ns (Close-In Weapon Syst	em) utilizing n	nedium-caliber projectiles would	
	train against high speed mo	· ·	,		
Typical	Platforms: Patrol combatan				
Components	Targets: Surface targets (e.g			ed mobile targets)	
	Systems being Trained/Tes	ted: Medium-caliber gun	systems		
Standard	Vessel safety	Typical Locations			
Operating Procedures	Weapons firing safety	Range Complexes/Tes	ting Ranges:	Inland Waters/Pierside:	
(Section 2.3.3)		Virginia Capes None			
(0000.011 _1010)		Navy Cherry Point			
		Jacksonville			
		Gulf of Mexico Other AFTT Areas			
Stressors to	Acoustic:	Physical Disturbance a	and Strike:	Energy:	
Biological	Vessel noise	Underwater explosives		In-air electromagnetic	
Resources	Weapons noise	Vessels and in-water d		devices	
	·	Military expended mat	erials		
	Explosives:			Entanglement:	
	Underwater explosives	Ingestion:		None	
		Military expended mat	erials –		
		munitions	orials other		
		Military expended mat than munitions	eriais – other		
Stressors to	Air Quality:		ts and Water	Ouality:	
Physical	Criteria air pollutants	Explosive		letals	
Resources	·	·			
	Habitats:				
	Physical disturbance and str	ike – military			
	expended material				
Stressors to	Underwater explosives Cultural Resources:	Socioeconomic Reso	aureoei	Dublic Hoolth and Safety:	
Stressors to Human	Explosives	Accessibility	ources:	Public Health and Safety: Physical interactions	
Resources	Physical disturbance and	Accessibility Airborne acoustics		In-air energy	
	strike	Physical disturbance	and strike	Underwater energy	
	Explosives	,		5 ,	

Surface Warfar	e		
Gunnery Exerci	se Surface-to-Surface Ship Medium-Caliber		
Military Expended Material	Ingestible Material: Target fragments, medium-caliber projectile (explosive) fragments, medium-caliber casings Non-Ingestible Material: None	Military Recoverable Material	Recoverable surface targets
Sonar and Other Transducer Bins In-Water	None E1		
Explosive Bins			
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3.2) Large-caliber weapons firing Physical Disturbance and Strike: (Section Vessel movement	Explosi pro	ve Stressors: (Section 5.3.3) ve medium-caliber and large-caliber jectiles
Assumptions Used for Analysis		are high-speed m re other stationar	naneuvering targets, which are recovered. Ty targets such as a steel drum that are

A.2.9.9 Gunnery Exercise Surface-to-Surface Ship Small-Caliber

Surface Warfar	A					
	se Surface-to-Surface Ship Sm	nall-Caliber				
Short	Surface ship crews fire smal		at	Typical Du	ration	
Description	surface targets.	i-caliber guits		2-3 hours		
Long		ews fire small-caliber guns at surface targets.				
Description	•	•				
·		-			ship, typically against stationary	
	floating targets. The target may be a 10 ft. diameter red balloon (Killer Tomato, see Figure A.2-4), a 50 gallon steel drum, or other available target, such as a cardboard box. Some targets are expende					
	during the exercise and are not recovered.					
	Ship crew qualifications con projectiles fired during these					
	Shipboard protection systen targets.	ns utilizing sm	all-caliber pr	ojectiles w	vill train against high speed mobile	
Typical	Platforms: Navy ships					
Components	Targets: Surface targets (e.g				ums, cardboard boxes)	
	Systems being Trained/Tes			ems		
Standard	Vessel safety	Typical Loca	tions			
Operating Procedures	Weapons firing safety	Range Com	plexes/Testi	ng Ranges:	Inland Waters/Pierside:	
(Section		Gulf of Mex			None	
2.3.3)		Jacksonville				
,		Navy Cherry Point				
		Virginia Cap Other AFTT				
Stressors to	Acoustic:		sturbance an	d Ctriko	Enorgy	
Biological	Vessel noise	•	in-water de		Energy: In-air electromagnetic	
Resources	Vesserrioise		ended mate		devices	
	Explosives:	, . ,				
	None	Ingestion:			Entanglement:	
			ended mate	rials –	None	
		munition				
Stressors to	Air Quality:			and Wate	er Quality:	
Physical Resources	Criteria air pollutants		Metals			
	Habitats:					
	Physical disturbance and stri	ke – military				
	expended material					
Stressors to	Cultural Resources:		nomic Resou	ırces:	Public Health and Safety:	
Human	Physical disturbance and	Accessibi	-		Physical interactions	
Resources	strike	Airborne		مانسهم امص	In-air energy	
Military	Ingostible Meterial	Priysical (disturbance a			
Military Expended	Ingestible Material: Small-caliber projectiles (no	n-	Military Recoverab	Non le	E	
Material	explosive), small-caliber call		Material			
	target fragments	0~/				
	Non-Ingestible Material:					
	None					

Surface Warfar	e
Gunnery Exerci	se Surface-to-Surface Ship Small-Caliber
Sonar and	None
Other	
Transducer	
Bins	
In-Water	None
Explosive	
Bins	
Procedural	Physical Disturbance and Strike: (Section 5.3.4)
Mitigation	Vessel movement
Measures	Small-, medium-, and large-caliber non-explosive
	practice munitions
Assumptions	Small-caliber gun rounds per exercise: 1,000 to 3,000 non-explosive practice munitions. The majority
Used for	of the activities will occur proximate to Navy homeports in Jacksonville, Florida and Norfolk,
Analysis	Virginia.



Figure A.2-4: "Killer Tomato" Stationary Floating Target



Figure A.2-5: QST-35 Seaborne Powered Target (on Left) and High-Speed Maneuvering Surface Target (on Right)

A.2.9.10 Integrated Live Fire

Surface Warfard	e			
Integrated Live				
Short	Naval forces defend against	a swarm of surface	Typical Duration	
Description	threats (ships or small boats		,,	
	rockets, and small-, medium	•	6-8 hours	
	guns.	•		
Long	Naval forces use coordinated	d tactics and deliver high	-explosive ordnance	against a swarm of surface
Description	maritime threats. Events wit	thin this activity include:	exercises for strike fi	ighters typically involve a
	flight of two to four aircraft			
	explosive or non-explosive b	_		-
	designed to detonate as an a	_	-	
	crews fire high-explosive pre	-	-	
	launched missiles (including		-	_
	and helicopter aircrew engage			
	crews engage surface target involve a single firing ship or		=	· -
	multiple ships, including a m		intext of a coordinate	ed larger exercise involving
Typical	Platforms: Fixed-wing aircra		urface combatants	sunnort craft
Components	Targets: Surface targets (e.g			7 7
	Systems being Trained/Test		_	
	aircraft platforms			
Standard	Vessel safety	Typical Locations		
Operating	Aircraft safety	D/T	tina Danasa Lula	ad Water /Diametria
Procedures		Range Complexes/Tes Jacksonville	ting Kanges: inia Non	nd Waters/Pierside:
(Section 2.3.3)	Weapons firing safety	Virginia Capes	NOTI	e
		-		
Stressors to	Acoustic:	Physical Disturbance a		nergy:
Biological	Aircraft noise	Aircraft and aerial targ		n-air electromagnetic
Resources	Vessel noise	Underwater explosives		devices
	Weapons noise	In-air explosives Vessels and in-water d		asers
	Explosives:	Military expended mat		ntanglement:
	Underwater explosives	willitary experiaca mai		lone
	In-air explosives	Ingestion:		
	·	Military expended mat	erials –	
		munitions		
		Military expended mat	erials – other	
		than munitions		
Stressors to	Air Quality:		ts and Water Qualit	y:
Physical	Criteria air pollutants	Explosive	es Metals	
Resources	Habitata.			
	Habitats:	ko — military		
	Physical disturbance and stri expended material	ke – mintary		
	Underwater explosives			
Stressors to	None		.	
Human	HOLIC			
Resources				

Surface Warfar	e		
Integrated Live	Fire		
Military Expended Material	Ingestible Material: Bomb (explosive) fragments, missile (explosive) fragments, medium- caliber projectiles (non-explosive), medium-caliber and large-caliber projectile (explosive) fragments, medium-caliber casings, rocket fragments, target fragments Non-Ingestible Material: Bombs (non-explosive), rockets (non- explosive), missiles (non-explosive), large-caliber casings	Military Recoverable Material	Recoverable surface targets
Sonar and Other Transducer Bins	None		
In-Water Explosive Bins	E1 E3 E6		E10
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3.2) Weapons firing Physical Disturbance and Strike: (Section 5.2) Vessel movement Small-, medium-, and large-caliber non-ex practice munitions Non-explosive missiles and rockets Non-explosive bombs	Explosi pro 5.3.4) Explosi Explosi	ve Stressors: (Section 5.3.3) ve medium-caliber and large-caliber jectiles ve missiles and rockets ve bombs
Assumptions Used for Analysis	Stressors to human resources were not an from shore.	alyzed for this ac	tivity since it occurs greater than 12 NM

A.2.9.11 Laser Targeting – Aircraft

Surface Warfard	2					
Laser Targeting						
Short	Fixed-wing and helicopter ai	ircrews illuminate	Туј	pical Dura	tion	
Description	enemy targets with lasers.			hours		
Long	Fixed-winged and helicopter aircrew illuminate enemy targets with lasers for engagement by					
Description	_	ser guided bombs or missiles. This exercise may be conducted alone or in				
					ns, such as surface missiles and	
	guided rockets. Exercises where weapons are fired are addressed in the appropriate activity (e.g.,					
	air-to-surface missile exercise). Lower powered lasers may also be used as non-lethal deterrents during maritime security operations (force protection).					
	during manume security operations (roice protection).					
		· · · · ·	r.			
Typical Components	Platforms: Fixed-wing aircra Targets: Surface targets	ift, rotary-wing air	craft, unma	inned aeria	al systems	
Components	Systems being Trained/Test	ted: Aircraft platfo	rms			
Standard	Aircraft safety	Typical Locations				
Operating	Unmanned aerial, surface,					
Procedures	and subsurface vehicle	Range Complexe Jacksonville	es/Testing	Ranges:	Inland Waters/Pierside:	
(Section 2.3.3)	safety	Virginia Capes			None	
		<u></u>				
Stressors to	Acoustic:	Physical Disturb		trike:	Energy:	
Biological Resources	Aircraft noise	Aircraft and aeri	ai targets		In-air electromagnetic devices	
Resources	Explosives:	Ingestion:			Lasers	
	None	None			2430.3	
					Entanglement:	
					None	
Stressors to	Air Quality:		diments an	nd Water (Quality:	
Physical	Criteria air pollutants	No	ne			
Resources	Habitats:					
	None					
Stressors to	None					
Human						
Resources						
Military	Ingestible Material:		itary	None		
Expended Material	None		coverable terial			
iviateriai	Non-Ingestible Material:	IVIA	teriai			
	None					
Sonar and	None				-	
Other						
Transducer						
Bins						
In-Water	None					
Explosive Bins						
Procedural	None		_		<u> </u>	
Mitigation	NOTE					
Measures						

Surface Warfar	Surface Warfare				
Laser Targeting	- Aircraft				
Assumptions Used for	Laser targeting for missile/rocket guidance will occur in areas where these exercises also occur. Use of lasers as force protection non-lethal deterrents will primarily occur proximate to Navy				
Analysis	homeports (Norfolk, Virginia and Jacksonville, Florida). Stressors to human resources were not analyzed for this activity since it occurs greater than 12 NM from shore.				

A.2.9.12 Laser Targeting – Ship

Surface Warfare							
Laser Targeting							
Short	Surface ship crews illuminat	e air and surface	Typical Du	ration			
Description	targets with high-energy las		1-2 hours				
Long		wer energy laser systems that are used to create critical failures in					
Description		gets. System directs a directed energy beam that can penetrate thin layers es (less than 1 nautical mile) that can render air and surface targets					
2 COC. 1pt. C.	_						
	-	systems can also be used in a low power setting as non-lethal deterrent during					
	•	ations (force protection). The low power capability would not be used					
	against manned platforms d		•	•			
Typical			os, combat lo	ogistics, specialized high-speed			
Components	vehicles, support craft, surfa	-		8			
	Targets: Air targets, surface						
	Systems being Trained/Test	_	m				
Standard	High-powered laser safety	Typical Locations					
Operating	Unmanned aerial, surface,		=				
Procedures	and subsurface vehicle	Range Complexes/Tes	sting Ranges:	· · · · · · · · · · · · · · · · · · ·			
(Section 2.3.3)	safety	Jacksonville		None			
		Virginia Capes					
Stressors to	Acoustic:	Physical Disturbance	and Strike:	Energy:			
Biological	Vessel noise	Military expended ma	terials	Lasers			
Resources	Weapons noise	Vessels and in-water of	devices	In-air electromagnetic			
		devices					
	Explosives:	Ingestion:					
	None	Military expended ma	terials – othe	er Entanglement:			
		than munitions		None			
Stressors to	Air Quality:	Sedime	nts and Wate	er Quality:			
Physical	Criteria air pollutants	None					
Resources							
	Habitats:						
	Physical disturbance and stri	ike – military					
_	expended material						
Stressors to	None						
Human							
Resources		a atitu					
Military	Ingestible Material:	Military	Non	e			
Expended Material	Target fragments	Recovera Material					
iviateriai	Non-Ingestible Material:	iviateriai					
	Aerial drones (expendable)						
Sonar and	None	· · · · · · · · · · · · · · · · · · ·					
Other							
Transducer							
Bins							
In-Water	None						
Explosive Bins							
	Physical Disturbance and St	rike: (Section 5 3 4)	<u> </u>				
Procedural	Thysical Distarbance and St	1 1 (Section 5.5. 1)					
Procedural Mitigation	Vessel movement	inci (Section 3.3. 1)					

Surface Warfare	Surface Warfare				
Laser Targeting – Ship					
Assumptions	Laser targeting for missile/rocket guidance will occur in areas where these exercises also occur.				
Used for	Use of lasers as force protection non-lethal deterrents will primarily occur proximate to Navy				
Analysis	homeports (Norfolk, Virginia and Jacksonville, Florida).				
	Stressors to human resources were not analyzed for this activity since it occurs greater than 12 NM				
	from shore.				

A.2.9.13 Maritime Security Operations

Surface Warfar	Surface Warfare					
Maritime Secur	ity Operations					
Short	Helicopter, surface ship, and	d small boat crews	Typical Duration			
Description	conduct a suite of maritime					
	sea, to include visit, board, s		Up to 3 hours			
	maritime interdiction opera	tions; force protection;	op to 3 hours			
Long	and anti-piracy operations. Helicopter and surface ship					
Description	search and seizure, maritime These activities involve train surface vessels for the purpe	e interdiction operations ning of boarding parties o	force protection, and ant elivered by helicopters an	i-piracy operations). d surface ships to		
	scenarios are employed and reconnaissance unmanned s hours.	-	•			
	Vessel Visit, Board, Search, a vessels, potentially under ho	ostile conditions.				
	Maritime Interdiction Opera detaining suspect vessels.					
	Maritime Infrastructure Pro		•	to defend off		
	platforms, similar at sea structures, harbors, piers, and other infrastructure. Warning Shot/Disabling Fire: Naval personnel train in the use of weapons to force fleeing or					
	_	•	•	ree neemig or		
	threatening small boats (typically operating at high speeds) to come to a stop. Ship Force Protection: Ship crews train in tracking multiple approaching, circling small craft,					
	assessing threat potential, and communicating amongst crewmates and other vessels to ensure					
	ships are protected against attack.					
	Anti-Piracy Training: Naval personnel train in deterring and interrupting piracy activity. Training includes large vessels (pirate "mother ships"), and multiple small, maneuverable, and fast craft.					
Tomical						
Typical Components	Platforms: Amphibious warf Targets: Surface targets	rare snips, rotary-wing ai	rcraft, surface compatants	s, small boats		
Components	Systems being Trained/Test	ted: None				
Standard	Vessel safety Typical Locations					
Operating	Aircraft safety					
Procedures	·	Range Complexes/Tes		aters/Pierside:		
(Section 2.3.3)		Gulf of Mexico Jacksonville		er and tributaries esapeake Bay		
		Navy Cherry Point		editionary Base Little		
		Northeast	Creek h			
		Virginia Capes		tion Norfolk pier		
		Ba capes	Broad Bay			
			•	tion Mayport basin		
	and pier Naval Station Newport Naval Station Newport					
			Port Cana	veral		
Stressors to	Acoustic:	Physical Disturbance a	=-			
Biological		Aircraft noise Aircraft and aerial targets In-air electromagnetic				
Resources	Vessel noise	Vessels and in-water d				
	Explosives:	Ingestion:		lement:		
	None	None	None			
Stressors to	Air Quality:	Sedimer	ts and Water Quality:			

Surface Warfar	e				
Maritime Secur	rity Operations				
Physical Resources	Criteria air pollutants Habitats:		None		
Stressors to Human Resources	None Cultural Resources: Physical disturbance and strike Ingestible Material:	Accessibi Airborne	nomic Resources lity acoustics disturbance and s		Public Health and Safety: Physical interactions In-air energy
Expended Material	None Non-Ingestible Material: None		Recoverable Material	None	
Sonar and Other Transducer Bins	None				
In-Water Explosive Bins	None				
Procedural Mitigation Measures	Physical Disturbance and Strik Vessel movement	e: (Section	5.3.4)		
Assumptions Used for Analysis	in the skills necessary to properations (maritime interces) when the properations (e.g. oil properations) and if the properations exercises involved maneuvering to overtake security Operations exercises around naval vessels), and security Operations training	otect naval diction oper platforms). The to tailor the estypically revessel mouspect vessione events exercises orida includises.	vessels from smarations and visit, I Maritime security raining exercises do not involve lively evement, someting el and/or small be tinvolve helicopte are conducted proding during times s accounted for in	all boat and board, seed operation to respond to respon	to naval homeports in Norfolk, t into and out of port, as well as y exercises, surface-to-surface

A.2.9.14 Missile Exercise Air-to-Surface

Short Sixed-wing and helicopter aircrews fire air-to- Typical Duration Surface missiles at surface targets. Thour Surface targets. Aircraft involved may be unmanned. Fixed-wing aircraft (fighters or maritime patrol aircraft) approach an at-sea surface target from high altitude, and launch high-explosive precision guided missiles. Helicopters designate at-sea surface targets with a laser or optics for a precision guided high-explosive or non-explosive practice munitions missile. Helicopter launched missiles typically pass through the target's "sail," and, if explosive, detonate at or just below, the water's surface. Platforms: fixed-wing aircraft, rotary-wing aircraft Systems being Trained/Tested: Aircraft platforms, missile systems Standard Operating Procedures (Section 2.3.3) Aircraft safety Weapons firing safety Weapons firing safety Weapons firing safety Range Complexes/Testing Ranges: Inland Waters/Pierside: None None None None None None None None Stressors to Biological Aircraft noise Aircraft and aerial targets In-air electromagnetic Underwater explosives Military expended materials Lasers Stressors to Military expended materials None Non	Surface Warfard	e					
Description Surface missiles at surface targets.	Missile Exercise	Air-to-Surface					
Description Surface missiles at surface targets.	Short	Fixed-wing and helicopter a	ircrews fire air	r-to- T	ypical Dura	tion	
Stressors to Biological Resources Accustic: Aircraft noise Aircraft and aerial targets Lasers	Description	_					
Fixed-wing aircraft (fighters or maritime patrol aircraft) approach an at-sea surface target from high altitude, and launch high-explosive precision guided missiles. Helicopters designate at-sea surface targets with a laser or optics for a precision guided high-explosive or non-explosive practice munitions missile. Helicopter launched missiles typically pass through the target's "sail," and, if explosive, detonate at or just below, the water's surface. Typical Components Typical Components Standard Operating Procedures (Section 2.3.3) Aircraft safety Weapons firing safety None None None None None Military expended materials Underwater explosives Military expended materials – other than munitions Stressors to Physical disturbance and strike – military expended material Underwater explosives None Meanurity Sediments and Water Quality: Criteria air pollutants Explosives Chemicals Metals Habitats: Physical disturbance and strike – military expended material Underwater explosives	_	Fighter, maritime patrol airc	craft, and helic		s fire precis	ion-guided missiles against	
altitude, and launch high-explosive precision guided missiles. Helicopters designate at-sea surface targets with a laser or optics for a precision guided high-explosive or non-explosive practice munitions missile. Helicopter launched missiles typically pass through the target's "sail," and, if explosive, detonate at or just below, the water's surface. Typical Components Typical Components Standard Operating Procedures (Section 2.3.3) Aircraft safety Weapons firing safety Weapons firing safety Weapons firing safety Acoustic: Physical Disturbance and Strike: Energy: Aircraft noise Aircraft and aerial targets In-air electromagnetic devices Explosives: Military expended materials Lasers Underwater explosives Ingestion: Entanglement: None Military expended materials – other than munitions Military expended materials – other than munitions Stressors to Physical Resources Air Quality: Sediments and Water Quality: Criteria air pollutants Explosives Chemicals Metals Habitats: Physical disturbance and strike – military expended material Underwater explosives Stressors to Physical disturbance and strike – military expended material Underwater explosives Air Quality: Sediments and Water Quality: Criteria air pollutants Explosives Chemicals Metals Habitats: Physical disturbance and strike – military expended material Underwater explosives Stressors to Human None	Description	surface targets. Aircraft invo	surface targets. Aircraft involved may be unmanned.				
Helicopters designate at-sea surface targets with a laser or optics for a precision guided high-explosive or non-explosive practice munitions missile. Helicopter launched missiles typically pass through the target's "sail," and, if explosive, detonate at or just below, the water's surface. Typical Components Platforms: Fixed-wing aircraft, rotary-wing aircraft Targets: Surface targets Systems being Trained/Tested: Aircraft platforms, missile systems Standard Operating Procedures (Section 2.3.3) Aircraft safety Weapons firing safety Weapons firing safety Typical Locations Range Complexes/Testing Ranges: Inland Waters/Pierside: None None Range Complexes/Testing Ranges: Inland Waters/Pierside: None Aircraft noise Aircraft and aerial targets In-air electromagnetic devices Lasers Underwater explosives Ingestion: Entanglement: Military expended materials — None munitions Military expended materials — other than munitions Stressors to Physical disturbance and strike — military expended materials Physical disturbance and strike — military expended material Underwater explosives Stressors to Human None None		Fixed-wing aircraft (fighters	d-wing aircraft (fighters or maritime patrol aircraft) approach an at-sea surface target from high				
explosive or non-explosive practice munitions missile. Helicopter launched missiles typically pass through the target's "sail," and, if explosive, detonate at or just below, the water's surface. Platforms: Fixed-wing aircraft, rotary-wing aircraft Targets: Surface targets Systems being Trained/Tested: Aircraft platforms, missile systems Standard Operating Procedures (Section 2.3.3) Aircraft safety Weapons firing safety Weapons firing safety None None None Inland Waters/Pierside: None None Inland Waters/Pierside: None None Miltary expended materials None Military expended materials – other than munitions Metals Habitats: Physical disturbance and strike – milit		altitude, and launch high-ex	plosive precis	ion guided mi	ssiles.		
Typical Components Typical Components Standard Operating Procedures (Section 2.3.3) Stressors to Physical Resources Stressors to Physical Resources Habitats: Physical disturbance and strike — military expended materials — One Metals Stressors to Physical disturbance and strike — Flysical disturbance and strike — military expended material Underwater explosives Stressors to Physical disturbance and strike — military expended material Underwater explosives Stressors to Physical disturbance and strike — military expended materials — One Metals Habitats: Physical disturbance and strike — military expended material or them the man of the military expended material or them them are provided material or them are provided material or them them are provided material or them are provided mat		Helicopters designate at-sea	a surface targe	ets with a lase	r or optics fo	or a precision guided high-	
Platforms: Fixed-wing aircraft, rotary-wing aircraft Targets: Surface targets Systems being Trained/Tested: Aircraft platforms, missile systems		explosive or non-explosive p	ractice munit	ions missile. F	lelicopter la	unched missiles typically pass	
Targets: Surface targets Systems being Trained/Tested: Aircraft platforms, missile systems Standard Operating Procedures (Section 2.3.3) Stressors to Biological Resources Family Stressors to Physical Disturbance and Strike: Energy: Aircraft noise Aircraft and aerial targets Underwater explosives Explosives: Military expended materials Aircraft and munitions Stressors to Physical Disturbance and Strike: Energy: Aircraft and aerial targets In-air electromagnetic devices Explosives: Military expended materials Lasers Underwater explosives Ingestion: Entanglement: Military expended materials – other than munitions Military expended materials – other than munitions Stressors to Physical Resources Habitats: Physical disturbance and strike – military expended material Underwater explosives Stressors to Human None					t or just bel	ow, the water's surface.	
Systems being Trained/Test Aircraft platforms, missile systems Standard Operating Procedures (Section 2.3.3) Stressors to Biological Resources Underwater explosives Stressors to Physical Disturbance and Strike: Energy: Aircraft noise Aircraft and aerial targets Underwater explosives Ingestion: Military expended materials — wilitary expended materials — other than munitions Stressors to Physical Resources Air Quality: Sediments and Water Quality: Criteria air pollutants Stressors to Physical disturbance and strike — military expended materials Habitats: Physical disturbance and strike — military expended materials Underwater explosives None Stressors to Physical disturbance and strike — military expended materials Habitats: Physical disturbance and strike — military expended materials Underwater explosives None		_	oft, rotary-win	g aircraft			
Standard Operating Procedures (Section 2.3.3) Weapons firing safety Weapons firing safety Weapons firing safety Range Complexes/Testing Ranges: Inland Waters/Pierside: None None None	Components	_	had. Aireraft m	la tf awaa wata	مصمعات ماك		
None Stressors to Physical Resources Air Quality: Criteria air pollutants Stressors to Physical Resources Habitats: Physical disturbance and strike Explosives Air Quality: Criteria air pollutants Explosives Chemicals Metals	Ctondord				sile systems		
Range Complexes/Testing Ranges: Inland Waters/Pierside: None None		• · · · · · · · · · · · · · · · · · · ·	турісаї цоса	tions			
Jacksonville None		weapons ming salety	_		g Ranges:	Inland Waters/Pierside:	
Stressors to Biological Resources Aircraft noise Aircraft and aerial targets Underwater explosives Ingestion: Military expended materials — None munitions Military expended materials — other than munitions Military expended materials — Other than munitions Stressors to Physical Resources Habitats: Physical disturbance and strike — military expended material Underwater explosives Stressors to Human None						None	
Acoustic:							
Biological Resources Aircraft noise Aircraft and aerial targets Underwater explosives Explosives: Underwater explosives Ingestion: Military expended materials — None Military expended materials — Other than munitions Military expended materials — Other than munitions Air Quality: Criteria air pollutants Air Quality: Criteria air pollutants Habitats: Physical disturbance and strike — military expended material Underwater explosives None Air Carl t noise Military expended materials — None Sediments and Water Quality: Criteria air pollutants Explosives Chemicals Metals Habitats: Physical disturbance and strike — military expended material Underwater explosives None	Stressors to	Acoustic			l Strika:	Fnergy:	
Resources Explosives: Military expended materials Lasers Underwater explosives Ingestion: Entanglement: Military expended materials — None munitions Military expended materials — other than munitions Stressors to Physical Resources Habitats: Physical disturbance and strike — military expended material Underwater explosives None Sediments and Water Quality: Explosives Chemicals Metals Habitats: Physical disturbance and strike — military expended material Underwater explosives None Stressors to Human			-			<u> </u>	
Underwater explosives Ingestion: Military expended materials — None munitions Military expended materials — other than munitions Stressors to Physical Resources Habitats: Physical disturbance and strike — military expended material Underwater explosives None Stressors to Human	_	7 6. 4. 7. 7. 6. 6. 6		_		•	
Ingestion: Military expended materials — None munitions Military expended materials — other than munitions Stressors to Physical Resources Habitats: Physical disturbance and strike — military expended material Underwater explosives None None Entanglement: None Metals — None Metals — Chemicals Metals Habitats: Physical disturbance and strike — military expended material Underwater explosives None				-	ials	Lasers	
Military expended materials — None munitions Military expended materials — other than munitions Stressors to Physical Resources Habitats: Physical disturbance and strike — military expended material Underwater explosives None Metals Sediments and Water Quality: Explosives Metals Metals Habitats: Physical disturbance and strike — military expended material Underwater explosives None		Underwater explosives					
Military expended materials – other than munitions Stressors to Physical Criteria air pollutants Explosives Chemicals Metals Habitats: Physical disturbance and strike – military expended material Underwater explosives Stressors to Human Military expended materials – other than munitions Sediments and Water Quality: Explosives Chemicals Metals Metals None			_			-	
Military expended materials – other than munitions Stressors to Physical Criteria air pollutants Explosives Chemicals Metals Habitats: Physical disturbance and strike – military expended material Underwater explosives Stressors to Human Military expended materials – other than munitions Sediments and Water Quality: Explosives Chemicals Metals Habitats: Physical disturbance and strike – military expended material Underwater explosives					ais –	None	
Stressors to Physical Resources Habitats: Physical disturbance and strike – military expended material Underwater explosives Human Habitats: Physical disturbance and strike – military expended material Underwater explosives				_	als – other		
Physical Criteria air pollutants Explosives Metals Habitats: Physical disturbance and strike – military expended material Underwater explosives Stressors to Human Criteria air pollutants Explosives Chemicals Metals Metals None							
Resources Habitats: Physical disturbance and strike – military expended material Underwater explosives Stressors to Human Metals Metals None	Stressors to	Air Quality:		Sediments	and Water	Quality:	
Habitats: Physical disturbance and strike – military expended material Underwater explosives Stressors to Human Habitats: Physical disturbance and strike – military expended material Underwater explosives	Physical	Criteria air pollutants		-	Cł	nemicals	
Physical disturbance and strike – military expended material Underwater explosives Stressors to Human	Resources			Metals			
expended material Underwater explosives Stressors to Human			iko militany				
Underwater explosives Stressors to Human Underwater explosives		·	ike – Illilital y				
Human		<u>.</u>					
	Stressors to	,					
	Human						
	Resources				_		
Military Ingestible Material: Military Recoverable surface targets	=	_		_		erable surface targets	
Expended Missile (explosive) fragments, target Recoverable Material Material	-		s, target				
Material fragments Material	iviaterial	inaginienits		iviateriai			
Non-Ingestible Material:		Non-Ingestible Material:					
Missiles (non-explosive)		_					

Surface Warfar	e				
Missile Exercise	Air-to-Surface				
Sonar and	None				
Other					
Transducer					
Bins					
In-Water	E6 E8 E10				
Explosive					
Bins					
Procedural	Physical Disturbance and Strike: (Section 5.3.4) Explosive Stressors: (Section 5.3.3)				
Mitigation	Non-explosive missiles and rockets Explosive missiles and rockets				
Measures					
Assumptions	Assume one missile and one target are used per exercise.				
Used for	While missiles could explode above the water's surface after contacting targets, analysis assumes				
Analysis	that all warheads explode at or just below the water's surface.				
	Stressors to human resources were not analyzed for this activity since it occurs greater than 12 NM				
	from shore.				

A.2.9.15 Missile Exercise Air-to-Surface – Rocket

Surface Warfar	e				
	Air-to-Surface—Rocket				
Short	Helicopter aircrews fire both	n nrecision-guided :	and T	ypical Durati	on .
Description	unguided rockets at surface			hour	<u> </u>
Long	Helicopters designate an at-sea surface target with				
Description	explosive or non-explosive practice munitions rockets.				
Typical	Platforms: Rotary-wing airci			nc	
Components	Targets: Surface targets	rart, ummanned act	iai systei	113	
Components	Systems being Trained/Test	ted: Aircraft platfor	ms miss	ile systems	
Standard	Aircraft safety	Typical Locations		ile systems	
Operating	Weapons firing safety	Typical Locations			
Procedures	Swimmer defense activity	Range Complexe	s/Testing	g Ranges:	Inland Waters/Pierside:
(Section 2.3.3)	safety	Gulf of Mexico			None
(0000.011 =1010)	Unmanned aerial, surface,	Jacksonville			
	and subsurface vehicle	Navy Cherry Poir	nt		
	safety	Virginia Capes			
	Towed in-water device				
	safety				
Stressors to	Acoustic:	Physical Disturba	ance and	Strike:	Energy:
Biological	Aircraft noise	Aircraft and aeria	al targets		In-air electromagnetic
Resources		Underwater expl	osives		devices
	Explosives:	Military expende	d materi	als	Lasers
	Underwater explosives				
		Ingestion:			Entanglement:
		Military expended materials – None			None
		munitions			
		Military expende		als – other	
		than munitior			
Stressors to	Air Quality:			and Water Q	
Physical	Criteria air pollutants	•	olosives	Che	micals
Resources	Habitata.	IVIE	etals		
	Habitats:	iko militaru			
	Physical disturbance and stri expended material	ike – military			
	Underwater explosives				
Stressors to	None	<u>-</u>		-	
Human	None				
Resources					
Military	Ingestible Material:	Mili	itary	Recover	able surface targets
Expended	-		overable		
Material	fragments	, •	terial		
	Non-Ingestible Material:				
	Rockets (non-explosive)				
Sonar and	None	•			
Other					
Transducer					
Bins					

Surface Warfar	
Missile Exercise	Air-to-Surface—Rocket
In-Water Explosive	E3
Bins	
Procedural Mitigation Measures	Physical Disturbance and Strike: (Section 5.3.4) Non-explosive missiles and rockets Explosive Stressors: (Section 5.3.3) Explosive missiles and rockets
Assumptions Used for Analysis	Assume all explosive rockets detonate in the water. Rockets may be used in conjunction with force protection events. Stressors to human resources were not analyzed for this activity since it occurs greater than 12 NM from shore. Assume 5 percent of non-explosive practice munitions are flechette rockets.

A.2.9.16 Missile Exercise Surface-to-Surface

Surface Warfard	e					
Missile Exercise	Surface-to-Surface					
Short	Surface ship crews defend a	gainst surface threats	Typical Dura	tion		
Description	(ships or small boats) and engage them with missiles.		2-5 hours			
Long Description	Surface ships launch missiles at surface maritime targets with the goal of destroying or disabling enemy ships or boats. After detecting and confirming a surface threat, the ship will fire a precision guided surface missile. Events with destroyers and cruisers will involve long range (over the horizon) Harpoon (or similar)					
		se events to certify ship		king exercises, the requirement ing exercise target is unavailable,		
	Events with littoral combat and patrol combatant ships will involve shorter range surface missiles, such as Hellfire and Griffin. Events with littoral combat and patrol combatant ships would be to certify ship's crew to defend against "close-in" (less than 10 miles) surface threats. These exercises are live fire, meaning that a missile is fired down range. Surface missiles could be equipped with either high-explosive or non-explosive warheads.					
Typical	Platforms: Surface combata	nts				
Components	Targets: Surface targets					
	Systems being Trained/Test					
Standard	Vessel safety	Typical Locations				
Operating Procedures	Weapons firing safety	Range Complexes/Tes	ting Ranges:	Inland Waters/Pierside:		
(Section 2.3.3)		Jacksonville		None		
(30000011 2.3.3)		Virginia Capes				
Stressors to	Acoustic:	Physical Disturbance a		Energy:		
Biological	Vessel noise	Underwater explosive		In-air electromagnetic		
Resources	Weapons noise	Vessels and in-water d		devices		
	Francisco.	Military expended ma	terials	Futouslamant		
	Explosives: Underwater explosives	Ingostion		Entanglement: None		
	onderwater explosives	Ingestion: Military expended manunitions	terials –	None		
		Military expended ma	terials – other			
		than munitions				
Stressors to	Air Quality:	Sedimer	its and Water (Quality:		
Physical	Criteria air pollutants	Explosive	es Ch	nemicals		
Resources		Metals				
	Habitats:	1				
	Physical disturbance and strike – military					
	expended material					
Chungaga un ha	Underwater explosives					
Stressors to Human	None					
Resources						
resources						

Surface Warfar	Surface Warfare					
Missile Exercise	Missile Exercise Surface-to-Surface					
Military Expended Material	Ingestible Material: Missile (explosive) fragments, target fragments Non-Ingestible Material:	Military Recoverable Material	Recoverable surface targets			
	Missile (non-explosive)					
Sonar and Other Transducer Bins	None					
In-Water Explosive Bins	E6 E10					
Procedural Mitigation Measures	Physical Disturbance and Strike: (Section Vessel movement	5.3.4)	•			
Assumptions Used for Analysis	Assume one missile and one target used per exercise. While missile could explode above the water's surface after contacting target, analysis assumes all warheads explode at or just below the surface. Stressors to human resources were not analyzed for this activity since it occurs greater than 12 NM from shore.					

A.2.9.17 Sinking Exercise

Surface Warfard	2			
Sinking Exercise				
Short		crows deliberately	Typical Dura	tion
Description	Aircraft, ship, and submarine crews deliberately sink a seaborne target, usually a decommissioned ship made environmentally safe for sinking according to U.S. Environmental Protection Agency standards, with a variety of ordnance. Typical Duration 4-8 hours, possibly over 1-2 days			
Long Description	Ship personnel and aircrew deliver high-explosive ordnance on a seaborne target, (large deactivated vessel), which is deliberately sunk using multiple weapon systems. A sinking exercise is typically conducted by aircraft, surface vessels, and submarines in order to take advantage of the ability to fire high-explosive ordnance on a full size ship target.			
		on Agency standards. The		y safe for sinking according to eater than 50 NM from shore
	Ship, aircraft, and submarine ordnance to sink the target. to extend target life. Typical however it is unpredictable	Non-explosive practice r ly, the exercise lasts for 4	nunitions may 1 to 8 hours an	be used during the initial stages d possibly over 1 to 2 days,
Typical Components	Platforms: Fixed-wing aircraft, submarines, surface combatants Targets: Ship hulks Systems being Trained/Tested: Large-caliber gun systems, missile systems, bombs, torpedoes, small-caliber gun systems			
Standard	Vessel safety	Typical Locations		
Operating Procedures (Section 2.3.3)	Aircraft safety Weapons firing safety	Range Complexes/Test Virginia Capes sinking of		Inland Waters/Pierside: None
Stressors to Biological Resources	Acoustic: Sonar and other transducers Aircraft noise Vessel noise Weapons noise	Physical Disturbance and Strike: Er Aircraft and aerial targets In Underwater explosives Vessels and in-water devices Military expended materials Er		Energy: In-air electromagnetic devices Entanglement: Wires and cables
	Explosives: Underwater explosives	Ingestion: Military expended mat munitions Military expended mat than munitions		
Stressors to Physical Resources	Air Quality: Criteria air pollutants Habitats: Physical disturbance and striexpended materials Physical disturbance and striexpended materials	Sedimen Explosive Metals ke – military	ts and Water (es Ch	Quality: nemicals
Stressors to Human	Underwater explosives None			

	Surface Warfare					
Sinking Exercise						
Resources						
Military Expended Material	Ingestible Material: Bomb (explosive) fragments, missile (explosive) fragments, medium caliber and large-caliber projectiles (explosive) fragments, small-caliber and medium-caliber projectiles (non- explosive), small-caliber casings, medium-caliber casings, heavyweight torpedo (explosive) fragments, heavyweight torpedo accessories	Military Recoverable Material	None			
	Non-Ingestible Material: Large-caliber projectiles (non-explosive), large-caliber casings, guidance wires					
Sonar and Other Transducer Bins	Torpedoes: TORP2					
In-Water Explosive Bins	E5 E8 E9		E10 E11			
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3.2) Weapons firing noise Physical Disturbance and Strike: (Section 5.3.4) Vessel movement Small-, medium-, and large-caliber non-explosive practice munitions Explosive Stressors: (Section 5.3.3) Explosive medium-caliber and large-caliber projectiles Explosive missiles and rockets Explosive bombs Sinking exercises					
	Non-explosive missiles and rockets Non-explosive bombs					
Assumptions Used for Analysis	Exercises occur greater than 50 NM from some daylight hours only. Due to the distance analyzed for this activity. The participants and assets typically included the participants and the participants and the participants are participants. 1-10 F/A-18, or maritime patrol aircraft and 2 aircraft for Command and Control 1 submarine aircraft are participants. 1-2 aircraft for Command and Control 1 submarine aircraft are participants. 1-2 Harpoon surface-to-surface or aircraft are participants. 2-12 MK-80 series general purpose bor 200 rounds large-caliber projectiles are projectiles are participants. 1-2 MK-48 heavyweight submarine-lauded are participants.	e from shore, str de: t ol co-surface missile missiles mbs nched torpedo mm	essors to human resources were not			

A.2.10 OTHER TRAINING EXERCISES

A.2.10.1 Elevated Causeway System

Other Training	Exercises					
Elevated Cause						
Short				Typical D	uration	
Description	A temporary pier is constru		acn.	Up to 20 days for construction and up to 10		
	Supporting pilings are drive then later removed.	n into the sand	iano i	days for removal (the pier can be in place for		
	then later removed.			up to 60 d	days)	
Long	A temporary pier, termed the	he "Elevated C	auseway Sy:	stem," is o	constructed off of the beach. The pier	
Description	_	•			m supply ships. Support pilings are	
		-			ms are then hoisted and secured	
	•	-	-		nbled by joining standard causeway	
	_		-	-	cluding associated piles, is removed in be constructed as an individual	
	-	_	-	-	ne-Shore training event, which can	
	last up to 30 days.	ed during the J	OITIC LOGISCIC	L3 OVEI-til	e-Shore training event, which can	
Typical	Platforms: Combat logistics	ships, fleet su	pport ships.	support (craft	
Components	Targets: None	,р.,				
•	_	sted: Elevated (Causeway S	ystem, inc	cluding impact hammer and vibratory	
	extractor					
Standard	Pile driving safety	Typical Locat	tions			
Operating		Range Comp	lexes/Testi	ng Range	s: Inland Waters/Pierside:	
Procedures		Navy Cherry			Lower Chesapeake Bay	
(Section 2.3.3)		', ' ' ',			,	
Stressors to	Acoustic:	Physical Dist	turbanca an	d Ctriko	Enorgy	
Biological	Vessel noise	Vessels and			Energy: In-air electromagnetic	
Resources	Pile driving	vessels and	iii-watei de	VICES	devices	
11000011000		Ingestion:			401.000	
	Explosives:	None			Entanglement:	
	None				None	
Stressors to	Air Quality:		Sediments	s and Wat	er Quality:	
Physical	Criteria air pollutants		None			
Resources						
	Habitats:	ماند ماند				
	Physical disturbance and str driving	ike – pile				
Stressors to	Cultural Resources:	Socioacon	nomic Resou	ircoc.	Public Health and Safety:	
Human	Physical disturbance and	Accessibili		uices.	Physical interactions	
Resources	strike	Airborne acoustics			In-air energy	
		Physical disturbance and strike				
Military	Ingestible Material:		Military	Noi	ne	
Expended	None		Recoverab	le		
Material			Material			
	Non-Ingestible Material:					
	None					
Sonar and	Pile driving and removal					
Other						
Transducer Bins						
כוווט						

Other Training	Exercises	
Elevated Cause	way System	
In-Water	None	
Explosive		
Bins		
Procedural	Physical Disturbance and Strike: (Section 5.3.4)	Acoustic Stressors: (Section 5.3.2)
Mitigation	Vessel movement	Pile driving
Measures		
Assumptions	None	
Used for		
Analysis		

A.2.10.2 Precision Anchoring

Other Training	Exercises								
Precision Ancho	oring								
Short				Typical Dura	tion				
Description	Releasing of anchors in des	ignated locatio	ns. —	Up to 1 hour					
Long	Ship crews choose the best	available anch		•	all means available to determine				
Description		is dropped to demonstrate calculating and plotting the anchor's position							
·	within 100 yards of center of			J					
Typical	Platforms: Navy ships	•							
Components	Targets: None								
	Systems being Trained/Tes	stems being Trained/Tested: None							
Standard Operating	Vessel safety	Typical Loca	tions						
Procedures			plexes/Testin	g Ranges:	Inland Waters/Pierside:				
(Section 2.3.3)		Gulf of Mex			Naval Station Mayport basin				
(00000000000000000000000000000000000000		Jacksonville			and pier				
		Virginia Cap			James River and tributaries				
Stressors to	Acoustic:	-	turbance and		Energy:				
Biological	Vessel noise		in-water dev	ices	In-air electromagnetic				
Resources		Seafloor de	vices		devices				
	Explosives:	Ingestion:							
	None				Entanglement:				
		None			None				
Stressors to	Air Quality:		Sediments	and Water	Quality:				
Physical	Criteria air pollutants		None						
Resources									
	Habitats:								
	Physical disturbance and str	rike – seafloor							
	devices								
Stressors to	Cultural Resources:		nomic Resou	rces:	Public Health and Safety:				
Human	Physical disturbance and	Accessibi	•		Physical interactions				
Resources	strike	Physical c	listurbance a	nd strike	In-air energy				
Military	Ingestible Material:		Military	None					
Expended	None		Recoverable	2					
Material			Material						
	Non-Ingestible Material:								
	None				-				
Sonar and	None								
Other									
Transducer									
Bins									
In-Water	None								
Explosive									
Bins		<u> </u>							
Bins Procedural	Physical Disturbance and S	trike: (Section	5.3.4)	<u>.</u>					
Bins Procedural Mitigation	Physical Disturbance and Soversel movement	trike: (Section .	5.3.4)	<u> </u>	<u> </u>				
Bins Procedural	Vessel movement	trike: (Section .	5.3.4)	_	<u> </u>				
Bins Procedural Mitigation Measures Assumptions	•	trike: (Section .	5.3.4)						
Bins Procedural Mitigation Measures	Vessel movement	trike: (Section .	5.3.4)						

A.2.10.3 Search and Rescue

Other Training	Exercises							
Search and Res	cue							
Short	Helicopter and ship crews re	escue military		Typic	al Durat	tion		
Description	personnel at sea.				Up to 2 hours			
Long Description	•	and deploy re er. Surface ship Ship crews wo	scue swimn os would co ould launch	ner an nduct a smal	d rescue man ove Il boat, c	lirect the recovery of the		
Typical Components	Platforms: Rotary-wing airc submarines, small boats Targets: None Systems being Trained/Tes		ombatants,	aircraf	ft carrier	s, amphibious warfare ships,		
Standard	Vessel safety Typical Locations							
Operating Procedures (Section 2.3.3)	Aircraft safety	Range Comp Jacksonville Virginia Cap		ing Ra	nges:	Inland Waters/Pierside: Naval Station Mayport basin and piers Naval Submarine Base Kings Bay (St. Mary's Inlet jetties) St. Johns River (Talbot Island) James River and tributaries Willoughby Bay Naval Station Norfolk basin and piers		
Stressors to	Acoustic:	Physical Dis			ike:	Energy:		
Biological Resources	Vessel noise Aircraft noise	Vessels and Aircraft and				In-air electromagnetic devices		
	Explosives: None	Ingestion: None				Entanglement: None		
Stressors to Physical Resources	Air Quality: Criteria air pollutants Habitats: None		Sediment None	ts and	Water (Quality:		
Stressors to	Cultural Resources:	Socioeconomic Resources: Accessibility Airborne acoustics Physical disturbance and strike				Public Health and Safety:		
Human Resources	Physical disturbance and strike				rike	Physical interactions In-air energy		
Military Expended Material	Ingestible Material: None Non-Ingestible Material:		Military Recoveral Material	ole	None			
	None							

Other Training	Other Training Exercises					
Search and Res	cue					
Sonar and	None					
Other						
Transducer						
Bins						
In-Water	None					
Explosive						
Bins						
Procedural	Physical Disturbance and Strike: (Section 5.3.4)					
Mitigation	Vessel movement					
Measures						
Assumptions	All material, including dummy figure, is recovered. Locations are typical, but ships may conduct man					
Used for	overboard training throughout the Study Area.					
Analysis						

A.2.10.4 Submarine Navigation

Other Training	Fyercises				
Submarine Nav					
Short	Submarine crews operate so	nar for navigation	and .	Typical Dura	tion
Description	detection while transiting in	_			
	during reduced visibility.		'	Up to 2 hour	S
Long	Submarine crews train to op	erate sonar for na	vigation.	The ability t	o navigate using sonar is critical
Description	for detection while transitin	g into and out of p	ort durir	ng periods of	reduced visibility. During this
	activity the submarine will b	e surfaced.			
Typical	Platforms: Submarines				
Components	Targets: None				
	Systems being Trained/Test	-			
Standard	Vessel safety	Typical Location	S		
Operating Procedures		Range Complexe	es/Testin	g Ranges:	Inland Waters/Pierside:
(Section 2.3.3)		None			Groton, Connecticut
(3000.077 2.3.3)					Kings Bay, Georgia
					Naval Station Mayport, Florida
					Naval Base Norfolk, Virginia
Stressors to	Acoustic:	Dhysiaal Distumb		d Chuilean	Port Canaveral, Florida
Biological	Sonar and other	Physical Disturb Vessels and in-w			Energy: None
Resources	transducers	vessels and m-w	rater dev	1003	None
	Vessel noise	Ingestion:			Entanglement:
		None			None
	Explosives:				
	None				
Stressors to	Air Quality:			and Water (Quality:
Physical	None	No	one		
Resources	Habitats:				
	None				
Stressors to	Cultural Resources:	Socioeconom	ic Resou	rces.	Public Health and Safety:
Human	Physical disturbance and	Accessibility			Physical interactions
Resources	strike	Physical distu	rbance a	nd strike	Underwater energy
Military	Ingestible Material:	Mi	litary	None	
Expended	None	Red	coverable	е	
Material	Non-Ingestible Material:	Ma	iterial		
	None				
Sonar and	Mid-Frequency:	High-Freque	ncy:		
Other	MF3	HF1			
Transducer					
Bins	<u>.</u>	<u> </u>		_	<u> </u>
In-Water	None				
Explosive Bins					
Procedural	Acoustic Stressors: (Section	5 3 2)	Dh	rsical Disturb	pance and Strike: (Section 5.3.4)
Mitigation	Active sonar	J.J.2]	_	sel moveme	
Measures			• • • •		

Other Training Exercises					
Submarine Navigation					
Assumptions	For biological resource analysis, vessel noise and vessel strike are only analyzed for the periods while				
Used for	the submarines are surfaced, typically brief in nature. Mitigation measures related to vessel				
Analysis	movement are only considered during the period of surfacing as well.				
	For human resource stressor analysis, physical disturbance and strike and physical interactions are				
	only analyzed for the periods while the submarine are surfaced, typically brief in nature.				

A.2.10.5 Submarine Sonar Maintenance and Systems Checks

Other Training	Exercises							
Submarine Son	ar Maintenance and Systems	Checks						
Short	Maintenance of submarine	sonar and oth	er	Typical Du	ıration			
Description	system checks are conducte	ed pierside or	at sea.	Up to 1 hour				
Long	A submarine performs perio	odic maintena	nce on the A	on the AN/BQQ-10 and submarine high-frequency				
Description	sonar systems while in port	or at sea. Sub	marines cor	nduct maint	enance to their sonar systems in			
	shallow water near their ho	meport, howe	ever, sonar r	naintenance	e could occur anywhere as the			
	system's performance may	warrant.						
Typical	Platforms: Submarines							
Components	Targets: None							
	Systems being Trained/Tes	sted: Sonar sys	stems					
Standard	Vessel safety	Typical Loca	itions					
Operating		Range Com	nlavas/Tast	ing Ranges	Inland Waters/Pierside:			
Procedures		Jacksonville	-	ing italiges.	Groton, Connecticut			
(Section 2.3.3)		Northeast			Kings Bay, Georgia			
		Virginia Cap	es		Norfolk, Virginia			
		Other AFTT			Port Canaveral, Florida			
Stressors to	Acoustic:		sturbance a	nd Strike:	Energy:			
Biological	Sonar and other	=	l in-water de		None			
Resources	transducers							
		Ingestion:			Entanglement:			
	Explosives:	None			None			
	None							
Stressors to	Air Quality:		Sediment	ts and Wate	er Quality:			
Physical	None		None					
Resources								
	Habitats:							
	None							
Stressors to	Cultural Resources:		nomic Reso	urces:	Public Health and Safety:			
Human	Physical disturbance and	Accessibi	•		Physical interactions			
Resources	strike	Physical	disturbance		-			
Military	Ingestible Material:		Military	Non	e			
Expended	None		Recoveral	ole				
Material	Non-Ingestible Material:		Material					
	None							
Sonar and	Mid-Frequency:	-	=	-	•			
Other	MF3							
Transducer								
Bins								
In-Water	None							
Explosive								
Bins		<u> </u>	<u>-</u>	<u> </u>	<u> </u>			
Procedural	Acoustic Stressors: (Section	5.3.2)		=	urbance and Strike: (Section 5.3.4)			
Mitigation	Active sonar		V	essel mover	nent			
Measures								
Assumptions	"Other AFTT Areas" refers to	o areas outsid	e of existing	range com	plexes and testing ranges.			
Used for								
Analysis								

A.2.10.6 Submarine Under Ice Certification

Other Training	Exercises						
Submarine Und	ler Ice Certification						
Short	Submarine crews operate so	nar while tra	nsiting	Туріс	cal Dura	tion	
Description	under ice. Ice conditions are	simulated du	ring	l lin die	- C h	- m - m - d	
	training and certification evo	ents.		Up to	o 6 nour	s per day over 5 days	
Long	Submarine crews train to op	erate under i	ce. Ice cond	ditions	are simu	ulated during training an	d
Description	certification exercises. A sin	gle exercise is	comprised	of 30 h	hours of	training, spread out ove	r 5 days
	in 6-hour training sessions.						
Typical	Platforms: Submarines						
Components	Targets: None						
	Systems being Trained/Tes	ted: Sonar sys	tems				
Standard	Vessel safety	Typical Loca	tions				
Operating		Range Com	nlovos/Tos	ting Ra	ngos:	Inland Waters/Piersid	٥٠
Procedures		Jacksonville	-	tilig iva	iliges.	None	С.
(Section		Navy Cherry				None	
2.3.3)		Northeast	, 1 01110				
		Virginia Cap	es				
Stressors to	Acoustic:	Physical Dis		nd Stri	ike:	Energy:	
Biological	Sonar and other	Vessels and				None	
Resources	transducers						
		Ingestion:				Entanglement:	
	Explosives:	None				None	
	None						
Stressors to	Air Quality:	-	Sedimen	ts and	Water (Quality:	
Physical	None		None			•	
Resources							
	Habitats:						
	None						
Stressors to	None						
Human							
Resources							
Military	Ingestible Material:		Military		None		
Expended	None		Recovera	ble			
Material			Material				
	Non-Ingestible Material:						
	None					-	
Sonar and	High-Frequency:						
Other	HF1						
Transducer							
Bins							
In-Water	None						
Explosive							
Bins	Acquetic Streets /S4'	F 2 21			l D:-+'	anne and Chulles /Carri	n F 2 41
Procedural	Acoustic Stressors: (Section	5.3.2)		_		pance and Strike: (Section	rı 5.3.4)
Mitigation	Active sonar		V	essei n	noveme	ΠŢ	
Measures	Chuanana ka haaraa aa				LIIA. · -!	ik	12 NIN 4
Assumptions Used for	Stressors to human resource	es were not ar	ialyzed for	ınıs act	livity sin	ce it occurs greater than	TZ INIVI
Analysis	from shore.						
Alldiysis	L						

A.2.10.7 Surface Ship Object Detection

Mine Warfare							
Surface Ship Ob	ject Detection						
Short	Ship crews detect and avoid	mines while		Typi	cal Duration		
Description	navigating restricted areas or sonar.	or channels usir	ng active	Up to 2 hours			
Long Description	Surface ship crews detect and avoid mines or other underwater hazardous objects while navigating restricted areas or channels using active sonar. A Littoral Combat Ship utilizes unmanned surface vehicles and remotely operated vehicles to tow mine detection (hunting) equipment. Systems will operate from a shallow zone greater than 40 ft. to deep water. Exercises could be embedded within major training exercises.						
Typical Components	Platforms: Surface combatants, unmanned surface vehicles Targets: Mine shapes Systems being Trained/Tested: Sonar systems						
Standard	Vessel safety	Typical Locat					
Operating Procedures (Section 2.3.3)	Unmanned aerial, surface, and subsurface vehicle safety Towed in-water device	Range Comp None		ting Ra	Na	and Waters/Pierside: val Station Mayport, Florida rfolk, Virginia	
Chuasaana ha	safety	Dhysical Dist		us al Cau	ilea	Го о и от и .	
Stressors to	Acoustic:	Physical Dist Vessels and i				Energy:	
Biological Resources	Sonar and other transducers	Seafloor dev		evices		In-air electromagnetic devices	
Resources	Vessel noise	Sealloof dev	ices			devices	
	vesserrioise	Ingestion:				Entanglement:	
	Explosives:	None				None	
	None	None				NOTIC	
Stressors to	Air Quality:	-	Sedimen	ts and	Water Quali	tv	
Physical	Criteria air pollutants		None	ts and	Water Quan	cy.	
Resources	Circeria dii poliatarito		Home				
	Habitats: Physical disturbance and stri devices	ke – seafloor					
Stressors to	Cultural Resources:	Socioecon	omic Reso	ources	: Pul	blic Health and Safety:	
Human	Physical disturbance and	Accessibili	-			sical interactions	
Resources	strike	Physical di	isturbance	and s		air energy derwater energy	
Military Expended Material	Ingestible Material: None Non-Ingestible Material: None		Military Recovera Material	ble	Recoverabl shapes)	e Training Targets (mine	
Sonar and	Mid-Frequency:	High-Fred	uency:				
Other	MF1K	HF8	· •				
Transducer Bins							
In-Water Explosive Bins	None			-			

Mine Warfare							
Surface Ship Object Detection							
Procedural	Acoustic Stressors: (Section 5.3.2)	Physical Disturbance and Strike: (Section 5.3.4)					
Mitigation	Active sonar	Vessel movement					
Measures		Towed in-water devices					
Assumptions	None						
Used for							
Analysis							

A.2.10.8 Surface Ship Sonar Maintenance and Systems Checks

Other Training	Exercises						
_	nar Maintenance and System	s Checks					
Short	Maintenance of surface ship	sonar and ot	her	Typic	al Dura	tion	
Description	system checks are conducte				4 hour	rs	
Long	This scenario consists of sur	face ships per	forming per	_		ance to the AN/SQS-53 sonar and	
Description	other ship systems while in		• • •				
	operate active sonar system	•					
	however, sonar maintenanc	e could occur	anywhere a	s the s	ystem's	s performance may warrant.	
Typical	Platforms: Surface combatants						
Components	Targets: None						
	Systems being Trained/Test	ted: Sonar sys	tems				
Standard	Vessel safety	Typical Loca	tions				
Operating		Range Com	nlavas/Tasti	ing Rai	ngos:	Inland Waters/Pierside:	
Procedures		Jacksonville	="	ing iva	iiges.	Naval Station Mayport, Florida	
(Section 2.3.3)		Navy Cherry				Naval Station Norfolk, Virginia	
		Virginia Cap				reard Station Horizon, Tinglina	
		Other AFTT					
Stressors to	Acoustic:	Physical Dis	turbance ar	nd Stri	ke:	Energy:	
Biological	Sonar and other	Vessels and				In-air electromagnetic	
Resources	transducers					devices	
	Vessel noise	Ingestion:					
		None				Entanglement:	
	Explosives:					None	
	None	-	-			1	
Stressors to	Air Quality:		Sediment	s and	Water (Quality:	
Physical	Criteria air pollutants		None				
Resources	Habitats:						
	None						
Stressors to	Cultural Resources:	Socioeco	nomic Reso	iirces.		Public Health and Safety:	
Human	Physical disturbance and	Accessibi		ui ccs.		Physical interactions	
Resources	strike		disturbance :	and st	rike	In-air energy	
		,				Underwater energy	
Military	Ingestible Material:	-	Military		None		
Expended	None		Recoverab	ole			
Material	Non-Ingestible Material:		Material				
	None						
Sonar and	Mid-Frequency:	High-Fre	unency.				
Other	MF1	HF8	quency.				
Transducer	=	0					
Bins							
In-Water	None						
Explosive							
Bins							
Procedural	Acoustic Stressors: (Section	5.3.2)	Ph	nysical	Disturb	pance and Strike: (Section 5.3.4)	
Mitigation	Active sonar		Ve	essel m	noveme	nt	
Measures							

Other Training	Other Training Exercises					
Surface Ship Sonar Maintenance and Systems Checks						
Assumptions	"Other AFTT Areas" refers to areas outside of existing range complexes and testing ranges.					
Used for						
Analysis						

A.2.10.9 Waterborne Training

Other Training I	Exercises					
Waterborne Tra						
Short	Personnel launch, operate,	and recover a va	riety T y	pical Durat	ion	
Description	of small boats to achieve ce		as			
	coxswain, crewman, and sat	coxswain, crewman, and safety observer.				
Long	Waterborne Training may ir	nclude qualificati	on and certif	fication as sa	afety observer, safety swimmer,	
Description	coxswain, and crewman util				_	
	inflatables, aluminum cham			-		
		moor to buoys,	anchor, and	operate a v	ariety of missions in shallow	
	waters.					
Typical	Platforms: Small boats					
Components	Targets: None Systems being Trained/Tes	tad. None				
Chandand	Systems being Trained/Tes					
Standard Operating	Vessel safety	Typical Location	ons			
Procedures		Range Comple	exes/Testing	Ranges:	Inland Waters/Pierside:	
(Section 2.3.3)		Northeast			Naval Station Newport	
(0000:0::: 2:0:0)		Jacksonville Virginia Capes			Cooper River	
					St. Johns River	
					Broad Bay	
					York River James River and tributaries	
					Joint Expeditionary Base Little Creek harbor	
					Joint Expeditionary Base Fort	
					Story	
					South Gate Annex	
					Cheatham Annex	
					Broad Bay	
Stressors to	Acoustic:	Physical Distu	rbance and	Strike:	Energy:	
Biological	Vessel noise	Vessels and in	-water devic	ces	None	
Resources						
	Explosives:	Ingestion:			Entanglement:	
	None	None			None	
Stressors to	Air Quality:		Sediments a	nd Water Q	uality:	
Physical	Criteria air pollutants		None			
Resources	Habitats:					
	None					
Stressors to	Cultural Resources:	Socioecono	mic Resourc	.00.	Public Health and Safety:	
Human	None	Socioeconomic Resources: Accessibility			Physical interactions	
Resources			turbance and	d strike	, stout interactions	
Military	Ingestible Material:	-	/lilitary	None		
Expended	None		Recoverable			
Material	- ·-		/laterial			
	Non-Ingestible Material:					
	None					

Other Training	Exercises			
Waterborne Tra	Waterborne Training			
Sonar and	None			
Other				
Transducer				
Bins				
In-Water	None			
Explosive				
Bins				
Procedural	Physical Disturbance and Strike: (Section 5.3.4)			
Mitigation	Vessel movement			
Measures				
Assumptions	None			
Used for				
Analysis				

A.3 TESTING ACTIVITIES

A.3.1 NAVAL AIR SYSTEMS COMMAND TESTING ACTIVITIES

Naval Air Systems Command activities will generally fall under fleet primary mission areas, such as the testing of airborne mine warfare and anti-submarine warfare weapons and systems. Naval Air Systems Command activities include, but are not limited to, the testing of new aircraft platforms (e.g., the F-35 Joint Strike Fighter aircraft), weapons, and systems (e.g., newly developed sonobuoys) that will ultimately be integrated into fleet training activities. In addition to testing new platforms, weapons, and systems, Naval Air Systems Command also conducts lot acceptance testing of sonobuoys and follow-on testing and evaluation of updated systems in support of fleet operational units. In general, the potential environmental effects from most Naval Air Systems Command testing events are similar to the associated fleet training exercises.

While many of these systems tested by Naval Air Systems Command will ultimately be used by the fleet, testing activities involving the same or similar systems may be conducted in different locations and manners than when conducted by the fleet. Because of these differences, the results of the analysis for testing activities may differ from the results for training activities.

A.3.1.1 Air Warfare

A.3.1.1.1 Air Combat Maneuver Test

Air Warfare					
Air Combat Ma	neuver Test				
Short	Aircrews engage in flight man	neuvers designed to	Typical Dura	ion	
Description	gain a tactical advantage duri	ng combat.	Up to 2 flight	hours per aircraft per event	
Long	Air combat maneuver is the g	general term used to describe an air-to-air test event involving two or			
Description	more aircraft, each engaged i	-		<u> </u>	
	altitude, and airspeed. No we	apons are fired during a	air combat mar	neuver activities.	
Typical	Platforms: Fixed-wing aircraft	t			
Components	Targets: Air targets				
	Systems being Trained/Te		<u> </u>		
Standard	Aircraft safety	Typical Locations			
Operating		Range Complexes/Test	ting Ranges:	Inland Waters/Pierside:	
Procedures		Virginia Capes	0 0	None	
(Section 2.3.3)	A	District			
Stressors to	Acoustic: Aircraft noise	Physical Disturbance a		Energy:	
Biological Resources	Aircraft noise	Aircraft and aerial targ	ets	In-air electromagnetic devices	
Resources	Explosives:	Ingestion:		devices	
	None	Military expended mat	erials – other	Entanglement:	
		than munitions		None	
Stressors to	Air Quality:	Sedimen	t and Water Q	uality:	
Physical	Criteria air pollutants	Metals	Other ma	terials	
Resources					
	Habitats:				
	Physical disturbance and strik	e – military			
	expended material				
Stressors to	Cultural Resources:	Socioeconomic Re	sources:	Public Health and Safety:	
Human	Physical disturbance and strik	•		Physical interactions	
Resources		Airborne acoustics	<u> </u>	In-air energy	

Air Warfare	Air Warfare						
Air Combat Ma	Air Combat Maneuver Test						
	Physical disturbance and strike						
Military	Ingestible Material:	Military	None				
Expended	Per chaff-air: one chaff-air cartridge,	Recoverable					
Material	one plastic endcap, one compression pad or one plastic piston, chaff fibers Per flare: one casing, one compression pad (closed cell foam) or one plastic piston, one plastic end cap, one Oring (rubber, nitrile) Non-Ingestible Material: None	Material					
Sonar and Other Transducer Bins	None						
In-Water Explosive Bins	None						
Procedural Mitigation Measures	None						
Assumptions Used for Analysis	All combustible material in flares is assum water.	ed to be consum	ed before contact of the casing with the				

A.3.1.1.2 Air Platform – Vehicle Test

Air Warfare					
Air Platform - V	ehicle Test				
Short	Testing performed to quanti	fy the flying qualities,	Typical Dura	ation	
Description	handling, airworthiness, stal		2-8 flight hours per event		
	and integrity of an air platfo	rm or vehicle. No			
	explosive weapons are relea	sed during an air			
	platform/vehicle test.				
Long	The air platform/vehicle test				
Description				n air platform/vehicle. Integration	
	of non-weapons system incl				
				d performance specifications for	
	T		-	ontrollability characteristics and	
	fixed-wing and rotary-wing a		-	ictive models. A wide variety of	
		_	-	atform/Vehicle Test. Aircraft may	
	-		_	Events may involve two or more	
				aft (e.g., Learjet for laser targeting	
	tests).				
Typical	Platforms: Fixed-wing aircra	ft, unmanned aerial syst	ems		
Components	Targets: None				
	Systems being Trained/Test	ted: Aircraft platforms			
Standard	Aircraft safety	Typical Locations			
Operating		Range Complexes/Test	ting Ranges:	Inland Waters/Pierside:	
Procedures		Gulf of Mexico		None	
(Section 2.3.3)		Jacksonville			
		Key West			
		Navy Cherry Point			
Ctuassaus to	Acquatic	Virginia Capes	and Chuilea.	Гранды	
Stressors to Biological	Acoustic: Aircraft noise	Physical Disturbance a Aircraft and aerial targ		Energy: In-air electromagnetic	
Resources	All Craft Hoise	Military expended mat		devices	
Resources	Explosives:	willtary expended mat	.eriai	Lasers	
	None	Ingestion:		243613	
		Military expended mat	erials – other	Entanglement:	
		than munitions		None	
Stressors to	Air Quality:	Sedimen	ts and Water	Quality:	
Physical	Criteria air pollutants		Other materia		
Resources					
	Habitats:				
	Physical disturbance and stri	ke – military			
	expended material				
Stressors to	Cultural Resources:	Socioeconomic Re	esources:	Public Health and Safety:	
Human	Physical disturbance and stri		_	Physical interactions	
Resources		Airborne acoustics		In-air energy	
		Physical disturban	ce and Strike		

Air Warfare	Air Warfare					
Air Platform - V	Air Platform - Vehicle Test					
Military Expended Material	Ingestible Material: Per one chaff-air: one chaff-air cartridge, one plastic endcap, one compression pad or one plastic piston Per one flare: one compression pad (closed cell foam) or one plastic piston, one plastic end cap, one O- ring (rubber, nitrile)	Military Recoverable Material	None			
	Non-Ingestible Material: Non-explosive practice munitions					
Sonar and Other Transducer Bins	None					
In-Water Explosive Bins	None					
Procedural Mitigation Measures	None					
Assumptions Used for Analysis	None					

A.3.1.1.3 Air Platform Weapons Integration Test

Air Warfare						
Air Platform Weapo	ns Integration Test					
Short Description	Testing performed to qu	uantify the		Typical Dura	ation	
	compatibility of weapor					
	from which they would			Un to 2.5 flig	ght hours per aircraft per event	
	released. Non-explosive	e weapons or s	shapes	Op to 2.5	Site flours per un orare per event	
	are used.					
Long Description					g performed to quantify the buld be released. Tests evaluate	
	· · · · · · · · · · · · · · · · · · ·			•	and launch equipment with the	
	T T T T T T T T T T T T T T T T T T T	•	_	•	rcraft. Additional tests assess the	
		_		_	craft at combat velocities,	
		-	-		inst design specifications for	
		•		-	nce characteristics and to improve	
	and update existing ana	alytical and pro	edictive mod	dels.	·	
Typical	Platforms: Fixed-wing a	aircraft, unmai	nned aerial s	systems		
Components	Targets: None					
	Systems being Trained,	/Tested: Mun	itions firing/	launching sys	stems	
Standard	Aircraft safety	Typical Loca				
Operating	Unmanned aerial,	Range Com		ng Ranges:	Inland Waters/Pierside:	
Procedures	surface, and subsurface vehicle	Virginia Cap	es		None	
(Section 2.3.3)	safety					
	Salety					
Stressors to	Acoustic:	Physical Dist	urbance and	Strike:	Energy:	
Biological	Aircraft noise	Aircraft and a			In-air electromagnetic	
Resources		Military expe	_		devices	
	Explosives:					
	None	Ingestion:			Entanglement:	
		Military expe				
Stressors to	Air Quality:			s and Water	Quality:	
Physical	Criteria air pollutants		Metals			
Resources	Habitats:					
	Physical disturbance and	d strika _				
	military expended m					
Stressors to	Cultural Resources:		nomic Reso	urces:	Public Health and Safety:	
Human Resources	Physical disturbance and	d Accessibi	lity		Physical interactions	
	strike	Airborne	-		In-air energy	
		Physical c	disturbance a	and strike		
Military	Ingestible Material:		Military			
Expended	None		Recoverab	ole		
Material		,	Material			
	Non-Ingestible Materia					
Company and Others	Non-explosive practice	munitions				
Sonar and Other Transducer Bins	None					
In-Water	None			-		
Explosive Bins	None					
Explosive bills						

Air Warfare			
Air Platform Weapons Integration Test			
Procedural	Physical Disturbance and Strike: (Section		
Mitigation	5.3.4)		
Measures	Non-explosive bombs and mine shapes		
Assumptions	None		
Used for Analysis			

A.3.1.1.4 Air-to-Air Weapons System Test

Air Warfare						
	oons System Test					
Short	Test to evaluate the effectiv	eness of air-launch	ned Typ	ical Dura	ition	
Description	weapons against designated			urs per aircraft per event		
Long					<u> </u>	
Description		ems test evaluates the performance of air-launched weapons systems the BQM-34, a high-performance target simulating a strike fighter				
Description	_	weapons systems test, a strike fighter aircraft locates, tracks, and, in				
	=	arget used to simulate another strike fighter aircraft using non-explosive				
	ordnance. No testing of expl					
Typical	Platforms: Fixed-wing aircra		, iaimeai			
Components	Targets: Air targets	Idit				
Components	Systems being Trained/Test	ted: Munitions firi	ng/launchin	g system	s	
Standard	Aircraft safety	Typical Locations		БЗУЗСП	5	
Operating	Aircraft safety			100000	Inland Matera/Dioreido	
Procedures	,	Range Complexe Gulf of Mexico	s/ resting R	anges:	Inland Waters/Pierside:	
(Section 2.3.3)	,	Guil of Mexico			None	
Stressors to	Acoustic:	Physical Disturb	anco and Ct	rika	Energy	
Biological	Aircraft noise	Aircraft and aeri		.rike.	Energy:	
Resources	Weapons noise	Military expende			In-air electromagnetic devices	
Resources	Weapons noise	willitary experior	tu illateriais	•	devices	
	Explosives:	Ingestion:			Entanglement:	
	None	Military expende	ad matarials	_	None	
	None	munitions	tu materiais	1	None	
Stressors to	Air Quality:		diment and	Water C	Auality:	
Physical	Criteria air pollutants		etals	water e	county.	
Resources	Criteria dii poliutarits	141	ctais			
ness united	Habitats:					
	Physical disturbance and stri	ke – military				
	expended material	/				
Stressors to	Cultural Resources:	Socioeconom	ic Resource	s:	Public Health and Safety:	
Human	Physical disturbance and	Accessibility			Physical interactions	
Resources	strike	Airborne acou	stics		In-air energy	
		Physical distu	bance and	strike	<i>5,</i>	
Military	Ingestible Material:		itary	None		
Expended	None		overable			
Material		Ma	terial			
	Non-Ingestible Material:					
	Missiles (non-explosive)					
Sonar and	None					
Other	None					
Transducer						
Bins						
In-Water	None	<u> </u>		-	<u> </u>	
Explosive	None					
Bins						
Procedural	Physical Disturbance and St	rika: (Saction E.2.4)			
Mitigation	Non-explosive missiles and r		/			
Measures	ivon-explosive missiles and f	OCKEIS				
ivieasures						

Air Warfare	Air Warfare				
Air-to-Air Wear	oons System Test				
Assumptions	None				
Used for					
Analysis					

A.3.1.1.5 Air-to-Air Gunnery Test – Medium-Caliber

Air Warfare					
Air-to-Air Gun	nery Test – Medium-Caliber				
Short	Test performed to evaluate	the effectiveness of	Typical Dura	ation	
Description	air-to-air guns against desigi	nated airborne	2 flight hour	s nor aircraft nor avent	
	targets. Fixed-wing aircraft r				
Long				-air. An air-to-air gunnery test	
Description				ed aerial banner that serves as the	
			gets fired upo	n are typically towed aerial banners.	
Typical	Platforms: Fixed-wing aircra	ift			
Components	Targets: Air targets Systems being Trained/Test	ted: Medium-caliher gu	ın systems		
Standard	Aircraft safety	Typical Locations	an systems		
Operating	Aircraft safety	Range Complexes/Te	neting .	Inland Waters/Pierside:	
Procedures	1	Ranges:	esting	None	
(Section	1	Virginia Capes		None	
2.3.3)		ga capes			
Stressors to	Acoustic:	Physical Disturbance	and Strike:	Energy:	
Biological	Aircraft noise	Aircraft and aerial tar	_	In-air electromagnetic devices	
Resources	Weapons noise	Military expended ma	aterials	Entanglement:	
		Ingestion:		None	
	Explosives:	Military expended ma	aterials –		
	None	munitions			
Stressors to	Air Quality:		Sediments a	nd Water Quality:	
Physical	Criteria air pollutants		Metals		
Resources					
	Habitats:	ika militamu			
	Physical disturbance and stri expended material	ike – mintary			
Stressors to	Cultural Resources:	Socioeconomic Reso	irces.	Public Health and Safety:	
Human	Physical disturbance and	Airborne acoustics	arces.	Physical interactions	
Resources	strike	Physical disturbance	and strike	In-air energy	
		Accessibility		<i>.</i>	
Military	Ingestible Material:		Military	None	
Expended	Medium-caliber projectiles (non-explosive),	Recoverab		
Material	medium-caliber casings		le Material		
	Non-Ingestible Material:				
	None				
Sonar and	None				
Other					
Transducer					
Bins					
In-Water	None				
Explosive Bins					
Procedural	Physical Disturbance and St	rika: (Saction E 2.4)	-		
Mitigation	Physical Disturbance and St Small-, medium-, and large-o	· · · · · · · · · · · · · · · · · · ·			
Measures	practice munitions	camper mon-explosive			
	practice manitions				

Air Warfare	
Air-to-Air Gun	nery Test – Medium-Caliber
Assumptions	None
Used for	
Analysis	

A.3.1.1.6 Air-to-Air Missile Test

Air Warfare					
Air-to-Air Missi	le Test				
Short	Test performed to evaluate	the effectiveness	of Typ	ical Dura	tion
Description	air-launched missiles agains	t designated airbo	orne		
	targets. Fixed-wing aircraft	will be used.	2.5	urs per aircraft per event	
Long	This event is similar to the t	raining event miss	sile exercise	(air-to-air). Tests are a type of air-to-air
Description	weapons system test in whi	ch air-to-air missi	les (non-expl	osive) are	e fired from fixed-wing aircraft
	against unmanned aerial dr	ones such as BQN	1-34 and BQN	Л-74 .	
Typical	Platforms: Fixed-wing aircra	aft			
Components	Targets: Air targets				
	Systems being Trained/Tes			/stems	
Standard	Aircraft safety	Typical Location	ns		
Operating	Weapons firing safety	Range Complex	ces/Testing F	Ranges:	Inland Waters/Pierside:
Procedures		Virginia Capes			None
(Section 2.3.3)					-
Stressors to	Acoustic:	Physical Distur		trike:	Energy:
Biological	Aircraft noise	Aircraft and ae			In-air electromagnetic
Resources	Weapons noise	Military expend	ded materials	5	devices
	Familia di casa		Entonologoate		
	Explosives: None	Ingestion: None			Entanglement: None
Stressors to	Air Quality:		ediment and	l Water O	
Physical	Criteria air pollutants		ediment and Aetals	i water Q	quanty.
Resources	Criteria an polititarits	IV	rictais		
Resources	Habitats:				
	Physical disturbance and str	ike – military			
	expended material				
Stressors to	Cultural Resources:	Socioeconor	nic Resource	s:	Public Health and Safety:
Human	Physical disturbance and	Accessibility			Physical interactions
Resources	strike	Airborne aco	oustics		In-air energy
		Physical dist	urbance and	strike	
				_	
Military	Ingestible Material:		lilitary	None	
Expended	None	Re	ecoverable		
Material		M	laterial		
	Non-Ingestible Material:				
_	Missiles (non-explosive)				
Sonar and	None				
Other					
Transducer Bins					
In-Water	None				
Explosive	INOTIC				
Bins					
Procedural	None	<u>.</u>	•	-	·
Mitigation					
Measures					

Air Warfare	
Air-to-Air Missi	ile Test
Assumptions	None
Used for	
Analysis	

A.3.1.1.7 Intelligence, Surveillance, and Reconnaissance Test

Air Warfare						
	eillance, and Reconnaissance	Test				
Short	Aircrews use all available se		ta on threat	Typical Duration		
Description	vessels.		tu on tin cut	2-20 flight hours per event		
Long	An air warfare intelligence,	surveillance. and r	econnaissance (IS	•		
Description	_	s of aircraft, including unmanned aerial systems that can carry				
·	-	cations equipment, or other payloads. New systems are tested at sea				
	to ensure proper communic	ations between aircraft and ships.				
	ISR aircraft systems act as ex	eyes in the sky, relaying raw imagery back to military personnel on the				
	•	ips at-sea. The data is processed, analyzed, and shared with U.S. Navy or other				
		litary aircraft or vessels. New ISR technology systems provide combat identification (friend				
	or foe) and are used for airc		•	•		
Typical	Platforms: Fixed-wing aircra	aft, rotary-wing air	craft, fixed-wing (unmanned aerial systems		
Components	Targets: Air targets, surface	targets	_	·		
	Systems being Trained/Tes	ted: ISR systems				
Standard	Aircraft safety	Typical Location	S			
Operating	Unmanned aerial, surface,	Range Complex	es/Testing	Inland Waters/Pierside:		
Procedures	and subsurface vehicle	Ranges:		None		
(Section 2.3.3)	safety	Jacksonville				
		Navy Cherry Po	int			
		Virginia Capes		-		
Stressors to	Acoustic:	=	ance and Strike:	Energy:		
Biological	Aircraft noise	Aircraft and aeri	al targets	In-air electromagnetic devices		
Resources	Explosives:	Installant Name				
	None	Ingestion: None		Entanglement: None		
Stressors to	Air Quality:	Sediments	and Water Qualit			
Physical	Criteria air pollutants	None	4	-1-		
Resources	·					
	Habitats:					
	None					
Stressors to	Cultural Resources:	Socioeconomic	Resources:	Public Health and Safety:		
Human	None	Accessibility		Physical interactions		
Resources		Airborne acoust		In-air energy		
		Physical disturba				
Military	Ingestible Material:		Military	None		
Expended	None		Recoverable			
Material	Non-Ingestible Material:		Material			
	None	- 1				
Sonar and	None					
Other	INOTIC					
Transducer Bins						
In-Water	None					
Explosive Bins						
Procedural	None					
-	None					

Air Warfare	
Intelligence, Sur	veillance, and Reconnaissance Test
Assumptions	None
Used for	
Analysis	

A.3.1.2 Anti-Submarine Warfare

Anti-submarine warfare activities involve helicopter and maritime patrol aircraft, ships, and submarines, conducting operations alone or in combination, to enhance or evaluate the ability to locate, track, and neutralize submarines. Anti-submarine warfare tests are intended to evaluate the capabilities of a variety of active and passive sonar systems. Some systems are used to characterize the environment by measuring water depth, for example, whereas others are designed to locate mines and identify, track, and target submarines. Passive sonar systems "listen" for sound by using underwater microphones, called hydrophones, which receive, filter, amplify, and process underwater sound in search of certain acoustic signatures. No sound is introduced into the water when using passive sonar. Passive sonar can indicate the presence, character, and movement of a submarine, to the extent that the submarine generates noise.

Active sonar is the most effective means for locating quiet, modern submarines because active sonar is not dependent on the sound being generated by the submarine. Active sonar transmits pulses of sound that travel through the water, reflect off objects, and return to a receiver. By knowing the speed of sound in water and the time taken for the sound wave to travel to the object and back, active sonar systems can quickly calculate direction and distance from the sonar platform to the underwater object. Being able to accurately track moving submarines is essential to U.S. ship survivability.

Advanced, large-scale anti-submarine warfare events (i.e., anti-submarine warfare coordinated events) involving active sonar are conducted in coordinated, at-sea activities during multidimensional fleet training events involving submarines, ships, fixed-wing aircraft, and helicopters. These integrated training events offer opportunities to conduct testing activities and to train aircrews in the use of new or newly enhanced systems during a large-scale, complex exercise. Coordinated anti-submarine warfare events often involve the full anti-submarine warfare continuum from detecting and tracking a submarine to attacking a target using either exercise torpedoes or simulated weapons. Training events include detection and tracking exercises against "enemy" submarine contacts, torpedo employment exercises against the target, and exercising command and control tasks in a multidimensional battlespace.

The torpedoes released during a torpedo employment exercise are non-explosive. No other weapons are fired during Naval Air Systems Command anti-submarine warfare tests. Anti-submarine warfare sonar systems are deployed from certain classes of surface ships, submarines, helicopters, and fixed-wing patrol aircraft. Helicopters equipped with dipping sonar or sonobuoys are utilized to locate suspect submarines or submarine targets within the training or testing area. In addition, fixed-wing patrol aircrafts are used to deploy both active and passive sonobuoys to assist in locating and tracking submarines during the duration of the test.

Anti-submarine warfare tests include sonobuoy lot acceptance tests, which evaluate the integrity of a series, or lot, of sonobuoys before the lot is turned over to the fleet; dipping sonar tests in both shallow and deep water; torpedo tests (non-explosive warhead); and sonobuoy tests with both coherent (acoustic) and incoherent (explosive) sonobuoys. The types of sound sources tested by Naval Air Systems Command during anti-submarine warfare sonar tests in the Study Area are identified in Table A.1-1, and descriptions of anti-submarine warfare tests are provided in the sections below.

A.3.1.2.1 Anti-Submarine Warfare Torpedo Test

Anti-Submarine	e Warfare						
Anti-Submarine	Warfare Torpedo Test						
Short	This event is similar to the tr	raining event torpedo	Typical Dura	tion			
Description	exercise. Test evaluates anti	-submarine warfare					
	systems onboard rotary-win	g and fixed-wing					
	aircraft and the ability to sea		2-6 flight hou	ırs per event			
	classify, localize, track, and a	attack a submarine or					
	similar target.	e, an anti-submarine warfare torpedo test evaluates anti-submarine					
Long Description	warfare systems onboard ro aircraft P-8) aircraft and the submarine or similar target. High Altitude Anti-Submarin remain clear of high threat a operation of non-explosive t systems are often used durin and are deployed at varying submarine as the target. Thi originate from a land base o exercise torpedo against the process of deploying torped (EXTORP) or non-running (R.)	tary-wing (e.g., MH-60R h ability to search for, detected, managed by a search for, detected, managed by a search for, detected, managed by a search for a surface ship. The etarget and is intended to oes from aircraft. All exerce EXTORP) and are non-expl	elicopter) and ct, classify, look, classify, look, classify, look, classify, look, classify, look, classify, look, classify, c	If fixed-wing (maritime patrol calize, track, and attack a choobuoys and torpedoes (using the pe delivered at high altitudes to varfare torpedo test is the other anti-submarine warfare argets simulate a submarine threat may be conducted using an actual or deep waters and aircraft can culminates with the release of an targeting, release, and tracking is used in testing are either running five percent of torpedoes are			
	recovered. A parachute asse	mbly used for aircraft-lau	nched torped	oes is jettisoned and sinks. Ballast			
				w for recovery, leaving the ballast			
	to sink to the bottom.						
Typical	Platforms: Fixed-wing aircra						
Components	Targets: Sub-surface targets Systems being Trained/Tested: Torpedoes/torpedo launching systems						
Chandand	_	·	iunching syste	ems			
Standard	Aircraft safety Weapons firing safety	Typical Locations	D	Inland Waters /Diensider			
Operating Procedures	Weapons ining safety	Range Complexes/Testi Jacksonville	ng Ranges:	Inland Waters/Pierside: None			
(Section 2.3.3)		Virginia Capes		None			
Stressors to	Acoustic:	Physical Disturbance an	d Strika:	Energy:			
Biological	Sonar and other	Aircraft and aerial targe		In-air electromagnetic			
Resources	transducers	Vessels and in-water de		devices			
	Aircraft noise	Military expended mate		4611665			
		Seafloor devices		Entanglement:			
	Explosives:			Wires and cables			
	None	Ingestion:		Decelerators/parachutes			
		Military expended mate	rials –				
		munitions					
		Military expended mate	rials – other				
		than munitions					
Stressors to	Air Quality:	Sediment: Metals	s and Water (
Physical Resources	Criteria air pollutants	Other mat		emicals			
Resources	Habitats:	Other Mat	.criais				
	Physical disturbance and stri	ke – military					
	expended material	,					
	Physical disturbance and stri	ke – seafloor					

Anti-Submarine	Warfare			
Anti-Submarine	e Warfare Torpedo Test			
	devices			
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike	Accessibi Airborne	nomic Resources lity acoustics disturbance and s	Physical interactions In-air energy
Military Expended Material	Ingestible Material: Small decelerators/parachutes, parachutes – medium, ballast Non-Ingestible Material: Expendable bathythermograph: expendable bathythermograph wires, sonobuoys (non-explose sonobuoy wires, expendable surface targets, lightweight to accessories	s, oh sive), sub-	Military Recoverable Material	Lightweight torpedoes (non-explosive), recoverable sub-surface targets
Sonar and Other Transducer Bins	Mid-Frequency: MF5	Torpedo TORP1	es:	
Explosive Bins	None	-		
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3.2) Active sonar			
Assumptions Used for Analysis	Assume one torpedo accessory Assume one target per torpedo		oarachute, ballast) per torpedo.

A.3.1.2.2 Anti-Submarine Warfare Tracking Test – Helicopter

Anti-Submarine	Warfare						
Anti-Submarine	Warfare Tracking Test – Hel	icopter					
Short	This event is similar to the t	raining event anti- Typic	cal Duration				
Description	submarine tracking exercise						
	evaluates the sensors and s	ystems used to detect					
	and track submarines and to	o ensure that 2 flig	ht hours per event				
	helicopter systems used to	deploy the tracking					
	systems perform to specific	pecifications.					
Long		Similar to an anti-submarine tracking exercise—helicopter, an Anti-Submarine Warfare Tracking Test					
Description	— helicopter evaluates the sensors and systems used to detect and track submarines and to ensure						
	-		perform to specifications. Typically, one				
			esting using the dipping sonar (e.g.,				
	• · · · · · · · · · · · · · · · · · · ·		passive sonobuoys (e.g., AN/SSQ-53D/E),				
			oys). Targets (e.g., MK-39 EMATT or MK-				
		_	re tracking test event. If available, tests				
			This activity would be conducted in or from a surface ship. Helicopter anti-				
	•		or from a surface slip. Helicopter anti- ors and systems used to detect and track				
			eploy the tracking systems perform to				
			its could be conducted as part of an anti-				
		ated event with fleet training ac					
Typical	Platforms: Rotary-wing airc						
Components	Targets: Sub-surface targets						
	_	ted: Sonobuoys, dipping sonar s	systems				
Standard	Aircraft safety	Typical Locations					
Operating		Range Complexes/Testing Ra	anges: Inland Waters/Pierside:				
Procedures		Gulf of Mexico	None				
(Section 2.3.3)		Jacksonville					
		Key West					
		Key West Northeast					
		Key West					
Stressors to	Acoustic:	Key West Northeast Virginia Capes Physical Disturbance and Str	= -				
Biological	Sonar and other	Key West Northeast Virginia Capes Physical Disturbance and Str Aircraft and aerial targets	In-air electromagnetic				
	Sonar and other transducers	Key West Northeast Virginia Capes Physical Disturbance and Str Aircraft and aerial targets Military expended materials	= -				
Biological	Sonar and other	Key West Northeast Virginia Capes Physical Disturbance and Str Aircraft and aerial targets	In-air electromagnetic devices				
Biological	Sonar and other transducers Aircraft noise	Key West Northeast Virginia Capes Physical Disturbance and Str Aircraft and aerial targets Military expended materials Underwater explosives	In-air electromagnetic devices Entanglement:				
Biological	Sonar and other transducers Aircraft noise Explosives:	Key West Northeast Virginia Capes Physical Disturbance and Str Aircraft and aerial targets Military expended materials Underwater explosives Ingestion:	In-air electromagnetic devices Entanglement: Wires and cables				
Biological	Sonar and other transducers Aircraft noise	Key West Northeast Virginia Capes Physical Disturbance and Str Aircraft and aerial targets Military expended materials Underwater explosives Ingestion: Military expended materials	In-air electromagnetic devices Entanglement: Wires and cables				
Biological Resources	Sonar and other transducers Aircraft noise Explosives: Underwater explosives	Key West Northeast Virginia Capes Physical Disturbance and Str Aircraft and aerial targets Military expended materials Underwater explosives Ingestion: Military expended materials than munitions	In-air electromagnetic devices Entanglement: Wires and cables other Decelerators/parachutes				
Biological Resources	Sonar and other transducers Aircraft noise Explosives: Underwater explosives Air Quality:	Key West Northeast Virginia Capes Physical Disturbance and Str Aircraft and aerial targets Military expended materials Underwater explosives Ingestion: Military expended materials than munitions Sediments and	In-air electromagnetic devices Entanglement: Wires and cables - other Decelerators/parachutes Water Quality:				
Biological Resources Stressors to Physical	Sonar and other transducers Aircraft noise Explosives: Underwater explosives	Key West Northeast Virginia Capes Physical Disturbance and Str Aircraft and aerial targets Military expended materials Underwater explosives Ingestion: Military expended materials than munitions Sediments and Explosives	In-air electromagnetic devices Entanglement: Wires and cables - other Decelerators/parachutes Water Quality: Chemicals				
Biological Resources	Sonar and other transducers Aircraft noise Explosives: Underwater explosives Air Quality:	Key West Northeast Virginia Capes Physical Disturbance and Str Aircraft and aerial targets Military expended materials Underwater explosives Ingestion: Military expended materials than munitions Sediments and	In-air electromagnetic devices Entanglement: Wires and cables - other Decelerators/parachutes Water Quality:				
Biological Resources Stressors to Physical	Sonar and other transducers Aircraft noise Explosives: Underwater explosives Air Quality: Criteria air pollutants Habitats:	Key West Northeast Virginia Capes Physical Disturbance and Str Aircraft and aerial targets Military expended materials Underwater explosives Ingestion: Military expended materials than munitions Sediments and Explosives Metals	In-air electromagnetic devices Entanglement: Wires and cables - other Decelerators/parachutes Water Quality: Chemicals				
Biological Resources Stressors to Physical	Sonar and other transducers Aircraft noise Explosives: Underwater explosives Air Quality: Criteria air pollutants Habitats: Physical disturbance and str	Key West Northeast Virginia Capes Physical Disturbance and Str Aircraft and aerial targets Military expended materials Underwater explosives Ingestion: Military expended materials than munitions Sediments and Explosives Metals	In-air electromagnetic devices Entanglement: Wires and cables - other Decelerators/parachutes Water Quality: Chemicals				
Biological Resources Stressors to Physical	Sonar and other transducers Aircraft noise Explosives: Underwater explosives Air Quality: Criteria air pollutants Habitats:	Key West Northeast Virginia Capes Physical Disturbance and Str Aircraft and aerial targets Military expended materials Underwater explosives Ingestion: Military expended materials than munitions Sediments and Explosives Metals	In-air electromagnetic devices Entanglement: Wires and cables - other Decelerators/parachutes Water Quality: Chemicals				
Biological Resources Stressors to Physical	Sonar and other transducers Aircraft noise Explosives: Underwater explosives Air Quality: Criteria air pollutants Habitats: Physical disturbance and strexpended material	Key West Northeast Virginia Capes Physical Disturbance and Str Aircraft and aerial targets Military expended materials Underwater explosives Ingestion: Military expended materials than munitions Sediments and Explosives Metals	In-air electromagnetic devices Entanglement: Wires and cables other Decelerators/parachutes Water Quality: Chemicals Other materials				
Biological Resources Stressors to Physical Resources	Sonar and other transducers Aircraft noise Explosives: Underwater explosives Air Quality: Criteria air pollutants Habitats: Physical disturbance and strexpended material Underwater explosives	Key West Northeast Virginia Capes Physical Disturbance and Str Aircraft and aerial targets Military expended materials Underwater explosives Ingestion: Military expended materials than munitions Sediments and Explosives Metals ike – military	In-air electromagnetic devices Entanglement: Wires and cables other Decelerators/parachutes Water Quality: Chemicals Other materials				
Biological Resources Stressors to Physical Resources Stressors to	Sonar and other transducers Aircraft noise Explosives: Underwater explosives Air Quality: Criteria air pollutants Habitats: Physical disturbance and strexpended material Underwater explosives	Key West Northeast Virginia Capes Physical Disturbance and Str Aircraft and aerial targets Military expended materials Underwater explosives Ingestion: Military expended materials than munitions Sediments and Explosives Metals ike – military Socioeconomic Resources:	In-air electromagnetic devices Entanglement: Wires and cables other Decelerators/parachutes Water Quality: Chemicals Other materials : Public Health and Safety:				

Anti-Submarin	e Warfare		
Anti-Submarin	e Warfare Tracking Test – Helicopter		
	Explosives		
Military Expended Material	Ingestible Material: Small decelerators/parachutes, sonobuoy (explosive) fragments Non-Ingestible Material: Sonobuoys (non-explosive), sonobuoy wires	Military Recoverable Material	Recoverable sub-surface targets
Sonar and Other Transducer Bins	Mid-Frequency: MF4 MF5		
In-Water Explosive Bins	E3		
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3.2) Active sonar	=	ve Stressors: (Section 5.3.3) ve sonobuoys
Assumptions Used for Analysis	None		

A.3.1.2.3 Anti-Submarine Warfare Tracking Test – Maritime Patrol Aircraft

Anti-Submarine	. Warfare						
Anti-Submarine	Warfare Tracking Test – Ma	ritime Patrol Aircraft					
Short	The test evaluates the senso	ors and systems used	Typical Du	ration			
Description	by maritime patrol aircraft t	o detect and track					
	submarines and to ensure t	hat aircraft systems	1 6 flight h	ours per event			
	used to deploy the tracking	systems perform to	4-0 Hight H	ours per event			
	specifications and meet ope	erational requirements.					
Long		e Warfare Tracking Exercise-Maritime Patrol Aircraft, an Anti-Submarine					
Description	9	aritime Patrol Aircraft evaluates the sensors and systems used to detect to ensure that platform systems used to deploy the tracking systems					
	T			3 or P-8 fixed-wing aircraft conduct			
				e.g., AN/SSQ-62 DICASS), explosive			
				B DIFAR), and smoke devices (e.g.,			
				ng an anti-submarine warfare			
				marine as the target. This activity			
	would be conducted in deep		•	of a coordinated event with fleet			
	training activities.	King tests could be condi-	icteu as part	or a coordinated event with neet			
Typical	Platforms: Fixed-wing aircra	nf+					
Typical Components	Targets: Sub-surface targets						
Components	_		v launching	systems, data transmission systems			
Standard	Aircraft safety	Typical Locations	y launching	systems, data transmission systems			
Operating	All clair salety	Range Complexes/Test	ting Panges:	Inland Waters/Pierside:			
Procedures		Gulf of Mexico	illig ivaliges.	None			
(Section 2.3.3)		Jacksonville		None			
,		Key West					
		Navy Cherry Point					
		Northeast					
		Virginia Capes					
Stressors to	Acoustic:	Physical Disturbance a	nd Strike:	Energy:			
Biological	Sonar and other	Aircraft and aerial targ	ets	In-air electromagnetic			
Resources	transducers	Vessels and in-water de	evices	devices			
	Aircraft noise	Military expended mat					
		Underwater explosives	i	Entanglement:			
	Explosives:			Wires and cables			
	Underwater explosives	Ingestion:		Decelerators/parachutes			
		Military expended mat	erials – othe	r			
Ch	Ata Ossalttas	than munitions	4 d 14 <i>1</i> -4-				
Stressors to	Air Quality:		ts and Wate				
Physical Resources	Criteria air pollutants	Explosive Metals		Chemicals Other materials			
Resources	Habitats:	ivietais		Other materials			
	Physical disturbance and str	ike – military					
	expended material	,					
	Underwater explosives						
Stressors to	Cultural Resources:	Socioeconomic Reso	ources:	Public Health and Safety:			
Human		Accessibility		Physical interactions			
Resources	Physical disturbance and	Airborne acoustics		In-air energy			
	strike	Physical disturbance	and strike	Underwater energy			
	Explosives	•		<u>.</u>			
	•						

Anti-Suhmarine	Anti-Submarine Warfare					
	Anti-Submarine Warfare Tracking Test – Maritime Patrol Aircraft					
Military	Ingestible Material:	Military	Exercise torpedoes, recoverable sub-			
Expended	Small decelerators/parachutes,	Recoverable	surface targets			
Material	sonobuoy (explosive) fragments	Material	surface targets			
Waterial	Soliobdoy (explosive) fragments	Wiaterial				
	Non-Ingestible Material:					
	Sonobuoys (non-explosive), expendable					
	sub-surface targets, sonobuoy wires					
Sonar and		marine Warfare:				
Other	MF5 MF6 ASW2	ASW5				
Transducer						
Bins						
In-Water	E1 E3					
Explosive						
Bins						
Procedural	None					
Mitigation						
Measures						
Assumptions	None					
Used for						
Analysis						

A.3.1.2.4 Kilo Dip

Anti-Submarine	e Warfare					
Kilo Dip						
Short	Functional check of a helico	nter deployed dipping	Typical Duration			
Description	sonar system (e.g., AN/AQS		- Typical 2 and ten			
2 000 mp 0.0 m	conducting a testing or train		1.5 flight hours per event			
	dipping sonar system.	0				
Long		term used to describe a	functional check of a helicopter deployed			
Description			ingle helicopter (e.g., MH-60) would transit to a			
	area designated for dipping	sonar testing (i.e., a dip	point usually close to shore) and would deploy			
	the sonar transducer assem	ply via a reel mechanism to a predetermined depth or series of depths				
	·		at the desired depth, the sonar transducer			
			sed, acoustic signal (i.e., ping) to check that all			
		-	completed, the sonar transducer assembly			
			opter would transit to a second dip point before			
			o more comprehensive testing.			
Typical	Platforms: Rotary-wing airc	raft				
Components	Targets: None	tad. Dinning course suct	ms			
6	Systems being Trained/Tes		ms			
Standard Operating	Aircraft safety	Typical Locations	ting Bangara Inland Makana / Diamida			
Procedures		Range Complexes/Tes				
(Section 2.3.3)		Gulf of Mexico Jacksonville	None			
(30001011 2.3.3)						
		Key West Northeast				
		Virginia Capes				
Stressors to	Acoustic:	Physical Disturbance	and Strike: Energy:			
Biological	Sonar and other	Aircraft and aerial targ	<u> </u>			
Resources		devices				
coources	transducers		devices			
	transducers Aircraft noise	Ingestion:	uevices			
. resources		Ingestion: None	uevices			
		_	uevices			
	Aircraft noise	None				
Stressors to	Aircraft noise Explosives: None Air Quality:	None Sedimer	nts and Water Quality:			
Stressors to Physical	Aircraft noise Explosives: None	None				
Stressors to	Aircraft noise Explosives: None Air Quality: Criteria air pollutants	None Sedimer				
Stressors to Physical	Aircraft noise Explosives: None Air Quality: Criteria air pollutants Habitats:	None Sedimer				
Stressors to Physical Resources	Aircraft noise Explosives: None Air Quality: Criteria air pollutants Habitats: None	None Sedimer None	nts and Water Quality:			
Stressors to Physical Resources	Aircraft noise Explosives: None Air Quality: Criteria air pollutants Habitats: None Cultural Resources:	Sedimer None	nts and Water Quality: esources: Public Health and Safety:			
Stressors to Physical Resources Stressors to Human	Aircraft noise Explosives: None Air Quality: Criteria air pollutants Habitats: None	Sedimer None Socioeconomic Real Accessibility	esources: Public Health and Safety: Physical interactions			
Stressors to Physical Resources	Aircraft noise Explosives: None Air Quality: Criteria air pollutants Habitats: None Cultural Resources:	Sedimer None Socioeconomic Re Accessibility Airborne acoustic	esources: Public Health and Safety: Physical interactions In-air energy			
Stressors to Physical Resources Stressors to Human Resources	Aircraft noise Explosives: None Air Quality: Criteria air pollutants Habitats: None Cultural Resources: None	Socioeconomic Re Accessibility Airborne acoustic Physical disturbar	esources: Public Health and Safety: Physical interactions In-air energy nce and strike Underwater energy			
Stressors to Physical Resources Stressors to Human Resources Military	Aircraft noise Explosives: None Air Quality: Criteria air pollutants Habitats: None Cultural Resources: None	Socioeconomic Re Accessibility Airborne acoustic Physical disturbar Military	esources: Public Health and Safety: Physical interactions In-air energy Underwater energy None			
Stressors to Physical Resources Stressors to Human Resources	Aircraft noise Explosives: None Air Quality: Criteria air pollutants Habitats: None Cultural Resources: None	Socioeconomic Re Accessibility Airborne acoustic Physical disturbar	esources: Public Health and Safety: Physical interactions In-air energy Underwater energy None			
Stressors to Physical Resources Stressors to Human Resources Military Expended	Aircraft noise Explosives: None Air Quality: Criteria air pollutants Habitats: None Cultural Resources: None	Sedimer None Socioeconomic Re Accessibility Airborne acoustic Physical disturbar Military Recovera	esources: Public Health and Safety: Physical interactions In-air energy Underwater energy None			
Stressors to Physical Resources Stressors to Human Resources Military Expended	Aircraft noise Explosives: None Air Quality: Criteria air pollutants Habitats: None Cultural Resources: None Ingestible Material: None	Sedimer None Socioeconomic Re Accessibility Airborne acoustic Physical disturbar Military Recovera	esources: Public Health and Safety: Physical interactions In-air energy Underwater energy None			
Stressors to Physical Resources Stressors to Human Resources Military Expended	Aircraft noise Explosives: None Air Quality: Criteria air pollutants Habitats: None Cultural Resources: None Ingestible Material: None Non-Ingestible Material:	Sedimer None Socioeconomic Re Accessibility Airborne acoustic Physical disturbar Military Recovera	esources: Public Health and Safety: Physical interactions In-air energy Underwater energy None			
Stressors to Physical Resources Stressors to Human Resources Military Expended Material	Aircraft noise Explosives: None Air Quality: Criteria air pollutants Habitats: None Cultural Resources: None Ingestible Material: None Non-Ingestible Material: None	Sedimer None Socioeconomic Re Accessibility Airborne acoustic Physical disturbar Military Recovera	esources: Public Health and Safety: Physical interactions In-air energy Underwater energy None			
Stressors to Physical Resources Stressors to Human Resources Military Expended Material	Aircraft noise Explosives: None Air Quality: Criteria air pollutants Habitats: None Cultural Resources: None Ingestible Material: None Non-Ingestible Material: None Mid-Frequency:	Sedimer None Socioeconomic Re Accessibility Airborne acoustic Physical disturbar Military Recovera	esources: Public Health and Safety: Physical interactions In-air energy Underwater energy None			
Stressors to Physical Resources Stressors to Human Resources Military Expended Material Sonar and Other	Aircraft noise Explosives: None Air Quality: Criteria air pollutants Habitats: None Cultural Resources: None Ingestible Material: None Non-Ingestible Material: None Mid-Frequency:	Sedimer None Socioeconomic Re Accessibility Airborne acoustic Physical disturbar Military Recovera	esources: Public Health and Safety: Physical interactions In-air energy Underwater energy None			

Anti-Submarine	e Warfare
Kilo Dip	
In-Water	None
Explosive	
Bins	
Procedural	Acoustic Stressors: (Section 5.3.2)
Mitigation	Active sonar
Measures	
Assumptions	None
Used for	
Analysis	

A.3.1.2.5 Sonobuoy Lot Acceptance Test

Anti-Submarine	e Warfare					
Sonobuoy Lot A	Acceptance Test					
Short	Sonobuoys are deployed fro	m surface ves	sels and	Турі	cal Durat	tion
Description	aircraft to verify the integrit	y and perform	nance of			
	a lot or group of sonobuoys	in advance of	delivery	6 flig	ht hours	per event
	to the fleet for operational ι	l use.				
Long	Sonobuoys are deployed fro	ys are deployed from surface vessels and aircraft to verify the integrity and performance of				
Description	a lot or group of sonobuoys	in advance of	delivery to	the fle	eet for op	perational use. Lot acceptance
	testing would occur for mult	iple types of s	sonobuoys	includ	ing non-i	mpulsive (e.g., AN/SSQ-62
	DICASS) and explosive (e.g.,					
Typical	Platforms: Fixed-wing aircra	ft, Navy ships				
Components	Targets: None					
	Systems being Trained/Test					
Standard	Vessel safety	Typical Loca	tions			
Operating	Aircraft safety	Range Com	plexes/Tes	ting Ra	anges:	Inland Waters/Pierside:
Procedures		Key West				None
(Section 2.3.3)						-
Stressors to	Acoustic:	Physical Dis			ike:	Energy:
Biological	Sonar and other	Aircraft and	_			In-air electromagnetic
Resources	transducers	Vessels and				devices
	Aircraft noise	Military exp				
	Vessel noise	Underwate	r explosives	5		Entanglement:
						Wires and cables
	Explosives:	Ingestion:				Decelerators/parachutes
	Underwater explosives	Military exp		eriais	– otner	
Stressors to	Air Quality:	than mu	Sedimen	tc and	Mater C	Quality
Physical	Criteria air pollutants		Explosive			emicals
Resources	Criteria an ponutants		Metals	-3		her materials
nesources	Habitats:		Wictais			Tel materials
	Physical disturbance and stri	ke – militarv				
	expended material	,				
	Underwater explosives					
Stressors to	Cultural Resources:	Socioeco	nomic Reso	ources	:	Public Health and Safety:
Human		Accessibi	lity			Physical interactions
Resources	Physical disturbance and	Airborne	acoustics			In-energy
	strike	Physical o	disturbance	and s	trike	Underwater energy
	Explosives					
Military	Ingestible Material:		Military		None	
Expended	Small decelerators/parachut	es,	Recovera	ble		
Material	sonobuoy (explosive) frag	ments	Material			
	Non-Ingestible Material:					
	Sonobuoys (non-explosive),	sonobuoy				
	wires					
Sonar and	Low-Frequency:	High-Fre				
Other	LF4	HF5	HF6)		
Transducer	Mid Froguesia	Aust C. I.	marine W			
Bins	Mid-Frequency:		marine Wa			
	MF5 MF6	ASW2	ASV	VO		

Anti-Submarine	Anti-Submarine Warfare				
Sonobuoy Lot A	Acceptance Tes	it			
In-Water	E1	E3	E4		
Explosive					
Bins					
Procedural	Acoustic Stre	essors: (Section 5.3.	2)	Explosive Stressors: (Section 5.3.3)	
Mitigation	Active sonar			Explosive sonobuoys	
Measures	Physical Dist	urbance and Strike	: (Section 5.3.4)		
	Vessel move	ment			
Assumptions	Assume one parachute per sonobuoy				
Used for					
Analysis					

A.3.1.3 Electronic Warfare

A.3.1.3.1 Chaff Test

Electronic Warf	are			
Chaff Test				
Short	This event is similar to the tr	raining event chaff	Typical Duration	on
Description	exercise. Chaff tests evaluate enhanced chaff, chaff disper modified aircraft systems ag deployment. Tests may also aircrews in the use of new clequipment. Chaff tests are of flare tests and air combat m well as other test events, an	e newly developed or nsing equipment, or gainst chaff train pilots and haff dispensing often conducted with aneuver events, as d are not typically	2-4 flight hours	
Long			d or onbancod o	shaff dispensing aguinment to
Long Description	Chaff tests are conducted to evaluate newly developed or enhanced chaff dispensing equipment, to ensure other newly developed or modified aircraft systems are compatible with chaff deployment, and to train pilots and aircrew in the use of new chaff dispensing equipment. Fixed-wing, rotary-wing, and tiltrotor aircraft deploy chaff to disrupt threat targeting and missile guidance radars and to defend against an attack (Electronic Protect deployment). Chaff tests are often conducted with flare tests or air combat maneuver events, as well as other tests, rather than as a standalone test. Weapons are not typically fired during chaff tests. Chaff is employed for a number of different tactical reasons, but the end goal is to create a target that will distract enemy radar and weapon systems away from the friendly platform. Chaff may also be employed offensively (Electronic Attack deployment), such as before a major strike to "hide" inbound striking aircraft. Different chaff types (e.g., RR-129A/AL, RR-144A/AL, and RR-170A/AL) are used by a variety of different Navy aircraft; however all chaff consists of a radar reflector material made of thin, narrow, metallic strips cut in various lengths, and is intended to elicit frequency responses which deceive enemy radars. Defensive chaff tests are the most common type of chaff test. In most cases, the chaff test is conducted to evaluate systems on the aircraft deploying the chaff, but it is also critical to view the effect of the chaff from the "enemy" perspective so that radar system operators may practice corrective procedures to overcome the chaff jamming effect. Chaff tests are often designed to gain experience and data from both perspectives. Chaff is typically deployed from an aircraft as the aircraft makes evasive maneuvers to defeat a simulated threat missile or threat aircraft. The chaff deploys in a cloud of the highly reflective filaments and deceives the guidance system of an inbound			
Typical	missile, allowing the aircraft Platforms: Fixed-wing aircra		trotor aircraft	
Components	Targets: None	irt, rotary-wing antialt, th	tiotor anciait	
	Systems being Trained/Test	ted: Chaff, chaff dispensir	ig systems	
Standard	Aircraft safety	Typical Locations		
Operating		Range Complexes/Test	ing Ranges: I	Inland Waters/Pierside:
Procedures (Section 2.3.3)		Gulf of Mexico Jacksonville Virginia Capes	1	None
Stressors to	Acoustic:	Physical Disturbance a		Energy:
Biological Resources	Aircraft noise	Aircraft and aerial targe Military expended mate		In-air electromagnetic devices
	Explosives:	la acation.		Entenelement
	None	Ingestion: Military expended mate than munitions	erials – other	Entanglement: None

Electronic Warf	are				
Chaff Test					
Stressors to Physical Resources	Air Quality: Criteria air pollutants Habitats: Physical disturbance and strike – r expended material	military	Sediments and Metals	Water (Other ma	-
Stressors to Human Resources	Physical disturbance and A strike A	ccessibil irborne	nomic Resources ity acoustics listurbance and si		Public Health and Safety: Physical interactions In-air energy
Military Expended Material	Ingestible Material: For chaff: one chaff-air cartridge, plastic endcap, one compression or one plastic piston For flares: one compression pad (cell foam) or one plastic piston, plastic endcap, one O-ring (rubb nitrile) Non-Ingestible Material: None	one n pad closed one	Military Recoverable Material	None	
Sonar and Other Transducer Bins In-Water Explosive	None	•			
Bins Procedural Mitigation Measures	None				·
Assumptions Used for Analysis	None				

A.3.1.3.2 Electronic System Evaluation

Electronic Warf	are				
Electronic Syste	ms Evaluation				
Short	Test that evaluates the effect	ctiveness of electronic	Typical Dura	tion	
Description	systems to control, deny, or portions of the electromagn general, electronic warfare t performance of three types systems: electronic attack, e electronic support.	etic spectrum. In esting will assess the of electronic warfare		urs per event	
Long Description	Electronic systems evaluations are performed to determine the effectiveness of designated electronic warfare systems to control, deny, or monitor critical portions of the electromagnetic spectrum. In general, electronic warfare testing will assess the performance of three types of electronic warfare systems; specifically, electronic attack, electronic protect, and electronic support. Aircraft electronic attack systems are designed to confuse the enemy or deny the enemy the use of its electronically-targeted weapons systems. The suppression of enemy air defenses and active jamming against hostile aircraft and surface combatant radars are examples of the application of electronic attack. Aircraft electronic protect systems are designed to intercept, identify, categorize, and defeat threat weapons systems that are already targeting that or other friendly aircraft. Aircraft electronic support systems employ passive tactics to intercept, exploit, locate (target), collect, collate, and decipher information from the radio frequency spectrum for the purpose of determining the intentions of the radiating source. Test results are compared against design specifications to evaluate the performance of the actually electronic warfare system. The test results are also used to define performance characteristics and to improve and update existing				
Typical	analytical and predictive mo Platforms: Fixed-wing aircra				
Components	Targets: Air targets, electror				
•	Systems being Trained/Test	_	stems, radar s	systems	
Standard	Aircraft safety	Typical Locations			
Operating Procedures (Section 2.3.3)	·	Range Complexes/Test Jacksonville Virginia Capes	ing Ranges:	Inland Waters/Pierside: None	
Stressors to	Acoustic:	Physical Disturbance a	nd Strike:	Energy:	
Biological	Aircraft noise	Aircraft and aerial targe	ets	In-air electromagnetic	
Resources				devices	
	Explosives:	Ingestion:		Enterelement	
	None	None		Entanglement: None	
Stressors to	Air Quality:	Sadiman	ts and Water (
Physical	Air Quality: Sediments and Water Quality:				
Resources	Criteria air pollutants None				
	Habitats:				
	None				
Stressors to	Cultural Resources:	Socioeconomic Re	sources:	Public Health and Safety:	
Human	None	Airborne acoustics		Physical interactions	
Resources		Physical disturband	e and strike	In-air energy	

Electronic Warf	Electronic Warfare			
Electronic Syste	Electronic Systems Evaluation			
Military	Ingestible Material:	Military	None	
Expended	None	Recoverable		
Material		Material		
	Non-Ingestible Material:			
	None			
Sonar and	None		 -	
Other				
Transducer				
Bins				
In-Water	None		 -	
Explosive				
Bins				
Procedural	None		 -	
Mitigation				
Measures				
Assumptions	None		 -	
Used for				
Analysis				

A.3.1.3.3 Flare Test

Electronic Warf	are				
Flare Test					
Short	This event is similar to the t	raining event flare	Typical Durat	tion	
Description	exercise. Flare tests evaluate		· /p ······		
	enhanced flares, flare dispe				
	modified aircraft systems ag				
	deployment. Tests may also				
	aircrew in the use of newly		2 flight hours	s per event	
	flare deployment systems. F	lare tests are often			
	conducted with chaff tests a	and air combat			
	maneuver events, as well as				
	are not typically conducted				
Long			-	or modified flare deployment	
Description	systems, to ensure that other newly enhanced aircraft systems are compatible with flare				
	deployment, and to train pilots and aircrew in the use of newly developed or modified flare deployment systems. Flare tests are often conducted with chaff tests and air combat maneuver				
			•	d as stand-alone tests. During a	
	flare test, flares (and in some cases chaff) are deployed, but no weapons are typically fired. Flare dispensers may also be jettisoned during a flare test intended to assess the safe release of the				
	dispenser in the event of an emergency.				
	Rotary-wing and tiltrotor aircraft deploy flares as a defensive tactic (electronic protect deployment)				
	to disrupt the infrared missile guidance systems used by heat-seeking missiles, thereby causing the				
	missile to lock onto the flare instead of onto the aircraft and enabling the aircraft to avoid the				
	threat. In a typical scenario, an aircraft may detect the electronic targeting signals emitted from threat radars or missiles, or aircrew may visually identify a threat missile plume when a missile is				
			-	ires and immediately maneuvers	
	the aircraft to distract and d		-	· · · · · · · · · · · · · · · · · · ·	
	flares 3,000 ft. above mean	_		-	
				mmonly deployed during Naval	
	for high speed aircraft and N			to: MJU-57, MJU-49, and MJU-38	
Typical	Platforms: Rotary-wing airci		iait.		
Components	Targets: None	rait, tiltiotor aircraft			
Components	Systems being Trained/Tes	ted: Flares flare dispensi	ng systems		
Standard	Aircraft safety	Typical Locations			
Operating	, o. a. e oa. o. j	Range Complexes/Test	ing Ranges:	Inland Waters/Pierside:	
Procedures		Gulf of Mexico	g .tages.	None	
(Section 2.3.3)		Virginia Capes			
Stressors to	Acoustic:	Physical Disturbance a	nd Strike:	Energy:	
Biological	Aircraft noise	Aircraft and aerial targe		In-air electromagnetic	
Resources		Military expended mate		devices	
	Explosives:	· ·			
	None	Ingestion:		Entanglement:	
		Military expended mate	erials – other	None	
		than munitions			
Stressors to	Air Quality:	Sedimen	t and Water Q	uality:	
Physical	Criteria air pollutants	Other ma	iterials		
Resources					
	Habitats:				

Electronic War	are				
Flare Test					
	Physical disturbance and strik expended material	e – military			
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike	Accessibi Airborne	nomic Resources lity acoustics disturbance and s		Public Health and Safety: Physical interactions In-air energy
Military Expended Material	Ingestible Material: Per flare: one casing, one con pad (closed cell foam) or or piston, one plastic endcap, (rubber, nitrile) Non-Ingestible Material: None	ne plastic	Military Recoverable Material	None	
Sonar and Other Transducer Bins	None	•			
Explosive Bins	None				
Procedural Mitigation Measures	None				
Assumptions Used for Analysis	None				

A.3.1.4 Mine Warfare

Mine warfare involves the detection, avoidance, and neutralization of mines to protect Navy ships and submarines and offensive mine laying in naval operations. A naval mine is a self-contained, explosive device placed in the water at predetermined depths to destroy ships or submarines. Naval mines are deposited and left in place until triggered by the approach of or contact with an enemy ship or until removed or otherwise destroyed. Naval mines can be laid by minelayers, other ships, submarines, and aircraft. Naval Air Systems Command mine warfare testing events include airborne mine countermeasures events, mine-laying events (similar to mine exercises), and mine neutralization events. The AN/ASQ-235 airborne mine neutralization system was developed to destroy mines or otherwise rendering them non-functional. The airborne laser mine detection system test, airborne dipping sonar minehunting test, and airborne sonobuoy minehunting test evaluate the capabilities of mine warfare systems to detect, classify, and fix the location of floating, near-surface moored, and bottom moored mines.

A.3.1.4.1 Airborne Dipping Sonar Minehunting Test

Mine Warfare	Mine Warfare				
Airborne Dippir	ng Sonar Minehunting Test				
Short Description	A mine-hunting dipping sonar system that is deployed from a helicopter and uses high-frequency sonar for the detection and classification of bottom and moored mines.		Typical Duration 2 flight hours per event		
Long Description Typical Components	Tests of a mine-hunting dipping sonar system to evaluate the search capabilities of this helicopter-deployed, mine hunting, detection, and classification system. The sonar identifies mine-like objects. Platforms: Rotary-wing aircraft Targets: Mine shapes (on established mine warfare training range) Systems being Trained/Tested: Dipping sonar systems				
Standard Operating Procedures (Section 2.3.3)	Aircraft safety	Typical Locations Range Complexes/Testing Ranges: Virginia Capes Naval Surface Warfare Center, Panama City Division		Inland Waters/Pierside: None	
Stressors to Biological Resources	Acoustic: Sonar and other transducers Aircraft noise	Physical Disturbance and Strike: Aircraft and aerial targets Ingestion: None		Energy: In-air electromagnetic devices Entanglement: None	
Stressors to Physical Resources	Air Quality: Criteria air pollutants Habitats: None	Sediment and Water Quality: None			
Stressors to Human Resources	Cultural Resources: None	Socioeconomic Re Airborne acoustics Physical disturband		Public Health and Safety: Physical interactions In-air energy Underwater energy	

Mine Warfare			
Airborne Dippir	ng Sonar Minehunting Test		
Military	Ingestible Material:	Military	None
Expended	None	Recoverable	
Material		Material	
	Non-Ingestible Material:		
	None		
Sonar and	High-Frequency:		
Other	HF4		
Transducer			
Bins			
In-Water	None		
Explosive			
Bins			
Procedural	Acoustic Stressors: (Section 5.3.2)		
Mitigation	Active sonar		
Measures			
Assumptions	None	-	
Used for			
Analysis			

A.3.1.4.2 Airborne Laser Based Mine Detection System Test

Mine Warfare					
Airborne Laser-	Based Mine Detection Systen	n Test			
Short	An airborne mine hunting te	est of a laser-based	Typical Duration		
Description	mine detection system, that	•	2.5 flight hours per event		
	helicopter (e.g., MH-60) and				
	system's ability to detect, cl	-			
	location of floating and near				
	mines. The system uses a lo	w energy laser to			
Long	locate mines.	eaction system test is heli	icopter (e.g., MH-60) evaluates the search		
Description			tection System. The Airborne Laser Mine		
2000			to detect, classify, and localize floating and		
	-		. The Airborne Laser Mine Detection System		
			oid wide-area reconnaissance and assessmen		
	of mine threats in littoral zo	nes, confined straits, chol	ke points, and amphibious objective areas fo	or	
	Carrier and Expeditionary Strike Groups.				
	The Airborne Laser Mine De	tection System uses pulse	ed laser light to image the entire near-surfac	e	
			Mine Detection System is capable of day or		
	night operations without sto	opping to deploy or recove	er equipment and without towing any		
	1 1	· · · · · · · · · · · · · · · · · · ·	s, it can attain high area search rates. This		
	_		erate image data negating the requirement		
			tem reliability. Airborne Laser Mine Detectio	n	
	detected mines.	te target geo-location to	support follow on neutralization of the		
Typical	Platforms: Rotary-wing airci	raft			
Components	Targets: Mine shapes (on es		raining range)		
Components	Systems being Trained/Test				
Standard	Aircraft safety	Typical Locations			
Operating	·	Range Complexes/Test	ting Ranges: Inland Waters/Pierside:		
Procedures		Virginia Capes	None		
(Section 2.3.3)		Naval Surface Warfare	Center,		
		Panama City Division	n		
Stressors to	Acoustic:	Physical Disturbance a	= -		
Biological	Aircraft noise	Aircraft and aerial targe	_		
Resources	Favolo di con	la sastia a.	devices		
	Explosives: None	Ingestion: None	Lasers		
	None	None	Entanglement:		
			None		
Stressors to	Air Quality:	Sediment	ts and Water Quality:		
Physical	Criteria air pollutants	None	•		
Resources					
	Habitats:				
	None	<u> </u>	<u>.</u>		
Stressors to	Cultural Resources:	Socioeconomic Re	,		
Human	None	Accessibility	Physical interactions		
Resources		Airborne acoustics	01		
		Physical disturband	ce and strike		

Mine Warfare	Mine Warfare			
Airborne Laser-	Based Mine Detection System Test			
Military	Ingestible Material:	Military	None	
Expended	None	Recoverable		
Material		Material		
	Non-Ingestible Material:			
	None			
Sonar and	None			
Other				
Transducer				
Bins				
In-Water	None			
Explosive				
Bins				
Procedural	None			
Mitigation				
Measures				
Assumptions	The activity uses an established mine warf	are training range	e and does not require the placement of	
Used for	moored mines.			
Analysis				

A.3.1.4.3 Airborne Mine Neutralization Systems Test

Mine Warfare					
Airborne Mine	Neutralization System Test				
Short	A test of the airborne mine	neutralization system	Typical Duration		
Description	evaluates the system's abilit	-			
	destroy mines from an airbo	orne mine			
	countermeasures capable ho	elicopter (e.g., MH-60).			
	The airborne mine neutralize	ation system uses up	2.5 flight hours per event		
	to four unmanned underwa	ter vehicles equipped			
	with high-frequency sonar, v	video cameras, and			
	explosive and non-explosive neutralizers.				
Long	Mine neutralization tests ev	aluate aircraft and aircra	ft systems intended to neutralize or otherwise		
Description	destroy mines through the use of explosives or other munitions. For most neutralization tests, mine				
	•		new or enhanced mine neutralization systems.		
			four unmanned underwater vehicles equipped		
			ocate previously detected submerged mines.		
	The unmanned underwater vehicles are also equipped with explosives to neutralize the mines after				
	they are located. Data from unmanned underwater vehicles are relayed to the operator in the				
	helicopter through a fiber-optic cable enabling the operator to position the neutralizing charge onto				
	the most vulnerable area of the mine. The explosive charge is then detonated to neutralize the				
	mine. For most tests, recoverable non-explosive neutralizers are used. A mine shape, rather than an				
	explosive mine, serves as the target and a range support vessel recovers the non-explosive neutralizer and the mine shape following the test. Testing scenarios include a non-explosive				
		_	=		
Tymical	Platforms: Rotary-wing aircr		ive neutralizer against an explosive mine.		
Typical Components	Targets: Mine shapes	ait, support boats, unina	illied underwater vehicles		
Components	Systems being Trained/Test	tad: Mine neutralization	systems		
Standard	Vessel safety	Typical Locations	systems		
Operating	Aircraft safety		ting Dongson Inland Mators / Diousido.		
Procedures	Unmanned aerial, surface,	Range Complexes/Tes Virginia Capes	ting Ranges: Inland Waters/Pierside: None		
(Section 2.3.3)	and subsurface vehicle	Naval Surface Warfare			
(3000.011 2.3.3)	safety	Panama City Division	center,		
Stressors to	Acoustic:	Physical Disturbance a	and Strike: Energy:		
Biological	Aircraft noise	Aircraft and aerial targ	= :		
Resources	Vessel noise	Underwater explosives	=		
1100001000	resser noise	Vessels and in-water d			
	Explosives:	Military expended mat			
	Underwater explosives	Seafloor devices	Wires and cables		
	·				
		Ingestion:			
		Military expended mat	terials –		
		munitions			
Stressors to	Air Quality:	Sedimen	nts and Water Quality:		
Physical	Criteria air pollutants	Explosive	es Chemicals		
Resources		Metals	Other materials		
	Habitats:				
	Physical disturbance and stri	ke – military			
	expended material				
	Physical disturbance and stri	ke – seafloor			
	devices				
	Underwater explosives				

Mine Warfare					
Airborne Mine	Neutralization System Test				
Stressors to	Cultural Resources:	Socioeco	nomic Resources	: Public Health and Safety:	
Human	Physical disturbance and	Accessibi	lity	Physical interactions	
Resources	strike		acoustics	In-air energy	
	Explosives	Physical o	disturbance and s	trike Underwater energy	
Military	Ingestible Material:		Military	Neutralizers (non-explosive), mine	
Expended Material	Mine (explosive) fragments (no preferred alternative only), ne (explosive) fragments		Recoverable Material	shapes (non-explosive)	
	Non-Ingestible Material:				
	Fiber optic cans, fiber optic cables				
Sonar and Other Transducer Bins	None				
In-Water Explosive Bins	E4 E11 (non-preferred alt	ernative)			
Procedural Mitigation Measures	Physical Disturbance and Strike: (Section 5.3.4) Vessel movement Explosive Stressors: (Section 5.3.3) Explosive mine countermeasure and neutralization activities				
Assumptions Used for Analysis	No explosive mines would be used under the preferred alternative. Explosive mines are proposed and analyzed under the non-preferred alternative.				

A.3.1.4.4 Airborne Sonobuoy Minehunting Test

Mine Warfare							
	ouoy Minehunting Test						
Short	A mine-hunting system mad	le un of sonoh	uovs is T	ypical Dura	tion		
Description	deployed from a helicopter.	•					
Description	using high-frequency sonar,						
	and classification of bottom	• · · · · · · · · · · · · · · · · · ·					
Long				h canahiliti	es of this helicopter-deployed,		
Description	mine hunting, detection, an						
Typical	Platforms: Rotary-wing airci						
Components	Targets: Mine shapes (on es		e warfare tra	ining range			
Components	Systems being Trained/Test				,		
Standard	Aircraft safety	Typical Loca					
Operating	Allerate salety		olexes/Testin	a Pangos:	Inland Waters/Pierside:		
Procedures		Virginia Cap		g ivaliges.	None		
(Section			ce Warfare Ce	antar	None		
2.3.3)			City Division	inter,			
Stressors to	Acoustic:		turbance and	l Strika:	Energy:		
Biological	Sonar and other		aerial targets		In-air electromagnetic		
Resources	transducers		J		devices		
Resources	Aircraft noise	Military expended materials devices					
	Allerate Hoise	Ingestion:			Entanglement:		
	Explosives:	Military expended materials – other			Wires and cables		
	None	than mui		idio otifici	Decelerators/parachutes		
		chan mai			Decelerators, paracriates		
Stressors to	Air Quality: Sediment and Water Quality:						
Physical	Criteria air pollutants Metals Chemicals						
Resources	·		Other mate	rials			
	Habitats:						
	Physical disturbance and strike – military						
	expended material						
Stressors to	Cultural Resources:	Socioed	onomic Reso	urces:	Public Health and Safety:		
Human	Physical disturbance and stri	ike Accessil	oility		Physical interactions		
Resources		Airborn	e acoustics		In-air energy		
		Physica	l disturbance	and strike	Underwater energy		
Military	Ingestible Material:		Military	None			
Expended	Small decelerators/parachut	tes	Recoverable	2			
Material			Material				
	Non-Ingestible Material:						
	Sonobuoys (non-explosive), sonobuoy						
	wires	_					
Sonar and	High-Frequency:						
Other	HF6						
Transducer							
Bins				<u>-</u>	-		
In-Water	None						
Explosive							
Bins							

Mine Warfare	Mine Warfare				
Airborne Sonol	Airborne Sonobuoy Minehunting Test				
Procedural	Acoustic Stressors: (Section 5.3.2)				
Mitigation	Active sonar				
Measures					
Assumptions	None				
Used for					
Analysis					

A.3.1.4.5 Mine-Laying Test

Mine Warfare	. •						
	.ct						
Mine Laying Te		- 4l C					
Short	Fixed-winged aircraft evaluate			cal Durat	ion		
Description	mine laying equipment and so	-					
	mines. A mine test may also t		- J tuc	tht hours	per event		
	mines using a new or enhance	ed mine deploym	ent	,			
	system.						
Long		xed-winged aircraft evaluate the performance of aircraft mine laying					
Description		•	-	_	plosive mine shapes. A mine tes		
	may also train aircrew in the						
		ployment system. Aircrew typically drop a series of about four non-explosive mine shapes					
					attern and dropping one or more		
	shapes each time. The non-ex	cplosive mine sha	pes are exper	ndable ar	id are typically not recovered		
	after the test.						
Typical	Platforms: Fixed-wing aircraft	t					
Components	Targets: Mine shapes						
	Systems being Trained/Teste						
Standard	Aircraft safety	Typical Location					
Operating		Range Complex	es/Testing Ra	anges:	Inland Waters/Pierside:		
Procedures		Jacksonville			None		
(Section		Virginia Capes					
2.3.3)		-					
Stressors to	Acoustic:	Physical Disturb		rike:	Energy:		
Biological	Aircraft noise	Aircraft and aer	_		In-air electromagnetic		
Resources		Military expended materials devices					
	Explosives:						
	None	Ingestion:			Entanglement:		
		None			None		
Stressors to	Air Quality:	Se	ediment and	Water Q	uality:		
Physical	Criteria air pollutants	M	letals				
Resources							
	Habitats:						
	Physical disturbance and strik	e – military					
	expended material						
Stressors to	Cultural Resources:	Socioeconom	nic Resources	:	Public Health and Safety:		
Human	Physical disturbance and strik	-			Physical interactions		
Resources		Airborne aco			In-air energy		
		Physical distu	rbance and s	trike			
Military	Ingestible Material:		ilitary	None			
Expended	None	Re	coverable				
Material		Ma	aterial				
	Non-Ingestible Material:						
	Non-Ingestible Material: Mine shapes (non-explosive)						
Sonar and	_						
	Mine shapes (non-explosive)						
Sonar and	Mine shapes (non-explosive)						
Sonar and Other	Mine shapes (non-explosive)						
Sonar and Other Transducer	Mine shapes (non-explosive)				<u>.</u>		
Sonar and Other Transducer Bins	Mine shapes (non-explosive) None				<u>.</u>		

Mine Warfare	
Mine Laying Te	est
Procedural	Physical Disturbance and Strike: (Section 5.3.4)
Mitigation	Non-explosive bombs and mine shapes
Measures	
Assumptions	When a test event occurs and aircrew receives training, the event will be analyzed as a testing event.
Used for	
Analysis	

A.3.1.5 Surface Warfare

Surface warfare is a type of naval warfare in which aircraft, surface ships, and submarines employ weapons, sensors, and operations directed against enemy surface vessels. Naval Air Systems Command surface warfare tests include air-to-surface missile, gunnery, and bombing tests, rocket tests, laser targeting tests, and high-energy laser weapons tests.

A sinking exercise is a specialized fleet training event that provides an opportunity for Naval Air Systems Command aircrew along with ship and submarine crews to deliver explosive ordnance on a deactivated vessel that has been cleaned and environmentally remediated. The vessel is deliberately sunk using multiple weapons systems. A Naval Air Systems Command testing event may take place in conjunction with a sinking exercise to test aircraft or aircraft systems in the delivery of explosive ordnance on a surface target.

A.3.1.5.1 Air-to-Surface Bombing Test

Air-to-Surface Bombing Test Short Description This event is similar to the training event bombing exercise air-to-surface. Fixed-wing aircraft test the delivery of bombs against surface maritime targets with the goal of evaluating the bomb, the bomb carry and delivery system, and any associated systems that may have been newly developed or enhanced. Long Description Fixed-wing aircraft test the delivery of bombs against surface maritime targets with the goal of evaluating the bomb, the bomb carry and delivery system, and any associated systems that may have been newly developed or enhanced. Both explosive and non-explosive bombs will be released to the training event bombing Typical Duration 2 flight hours per event	Surface Warfare						
This event is similar to the training event bombing exercise air-to-surface. Fixed-wing aircraft test the delivery of bombs against surface maritime targets with the goal of evaluating the bomb, the bomb carry and delivery system, and any associated systems that may have been newly developed or enhanced. Long Description Fixed-wing aircraft test the delivery of bombs against surface maritime targets with the goal of evaluating the bomb, the bomb carry and delivery system, and any associated systems that may have been newly developed or enhanced. Fixed-wing aircraft test the delivery of bombs against surface maritime targets with the goal of evaluating the bomb, the bomb carry and delivery system, and any associated systems that may have been newly developed or enhanced. Both explosive and non-explosive bombs will be releduring this type of test; however, the vast majority of releases will be non-explosive bombs and typically include non-explosive general purpose bombs (e.g., MK 82 and MK 83) and guided bounits (e.g., GBU-12 and GBU-32) of various sizes. Surface targets may also be used. Platforms: Fixed-wing aircraft, unmanned aerial systems Targets: Surface targets: Systems being Trained/Tested: Bomb releasing systems Targets: Surface targets: Systems being Trained/Tested: Bomb releasing systems Typical Locations Range Complexes/Testing Ranges: Inland Waters/Pierside: None None Range Complexes/Testing Ranges: Inland Waters/Pierside: None None Typical Components Entanglement: Ingestion: Ingestion: None							
delivery of bombs against surface maritime targets with the goal of evaluating the bomb, the bomb carry and delivery system, and any associated systems that may have been newly developed or enhanced. Long Description Fixed-wing aircraft test the delivery of bombs against surface maritime targets with the goal of evaluating the bomb, the bomb carry and delivery system, and any associated systems that may have been newly developed or enhanced. Both explosive and non-explosive bombs will be releduring this type of test; however, the vast majority of releases will be non-explosive bombs and typically include non-explosive general purpose bombs (e.g., MK 82 and MK 83) and guided bounits (e.g., GBU-12 and GBU-32) of various sizes. Surface targets may also be used. Typical Components Typical Components Standard Operating Procedures (Section 2.3.3) Aircraft safety Unmanned aerial, surface, and subsurface vehicle safety Virginia Capes None Aircraft noise Aircraft and aerial targets Underwater explosives Military expended materials Underwater explosives Inland Waters/Pierside: Underwater explosives Entanglement: None	Short	This event is similar to the tr		Typical Dura	ation		
evaluating the bomb, the bomb carry and delivery system, and any associated systems that many have been newly developed or enhanced. Both explosive and non-explosive bombs will be released during this type of test; however, the vast majority of releases will be non-explosive bombs and typically include non-explosive general purpose bombs (e.g., MK 82 and MK 83) and guided bounits (e.g., GBU-12 and GBU-32) of various sizes. Surface targets may also be used. Typical Components	Description	delivery of bombs against su with the goal of evaluating t carry and delivery system, a systems that may have been enhanced.	orface maritime targets he bomb, the bomb nd any associated n newly developed or	2 flight hours per event			
Targets: Surface targets Systems being Trained/Tested: Bomb releasing systems Standard Operating Procedures (Section 2.3.3) Stressors to Biological Resources Explosives: Underwater explosives Underwater explosives Typical Locations Range Complexes/Testing Ranges: Virginia Capes Virginia Capes None Physical Disturbance and Strike: Underwater explosives Energy: In-air electromagnetic devices Military expended materials Underwater explosives Entanglement: None	Description	Fixed-wing aircraft test the delivery of bombs against surface maritime targets with the goal of evaluating the bomb, the bomb carry and delivery system, and any associated systems that may have been newly developed or enhanced. Both explosive and non-explosive bombs will be released during this type of test; however, the vast majority of releases will be non-explosive bombs and typically include non-explosive general purpose bombs (e.g., MK 82 and MK 83) and guided bomb units (e.g., GBU-12 and GBU-32) of various sizes. Surface targets may also be used.					
Operating Procedures (Section 2.3.3) Stressors to Biological Resources Explosives: Unmanned aerial, surface, and subsurface vehicle safety Range Complexes/Testing Ranges: None None		Targets: Surface targets					
Procedures (Section 2.3.3) Stressors to Biological Resources Explosives: Underwater explosives	Standard	•	Typical Locations				
Biological Resources Aircraft noise Aircraft and aerial targets In-air electromagnetic devices Explosives: Military expended materials Underwater explosives Entanglement: Ingestion: None	Procedures	and subsurface vehicle	•	ing Ranges:	· ·		
Ingestion: None	Biological	Acoustic: Aircraft noise	Aircraft and aerial targe Underwater explosives	ets	In-air electromagnetic		
munitions Military expended materials – other than munitions		Underwater explosives	Military expended mat munitions Military expended mat		_		
Stressors to Physical Resources Air Quality: Sediments and Water Quality: Explosives Metals Habitats:	Physical	Criteria air pollutants			•		

Surface Warfar	·e				
Air-to-Surface	Bombing Test				
	Physical disturbance and strike expended material Underwater explosives	e – military			
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike Explosives	Accessibi Airborne	acoustics disturbance and s		Public Health and Safety: Physical interactions In-air energy Underwater energy
Military Expended Material	Ingestible Material: Bomb (explosive) fragments, t fragments Non-Ingestible Material: Bombs (non-explosive)	arget	Military Recoverable Material	None	
Sonar and Other Transducer Bins	None				
In-Water Explosive Bins	E9				
Procedural Mitigation Measures	Physical Disturbance and Strik Non-explosive bombs and min		· · · · ·	ve Stress ve bomb	sors: (Section 5.3.3) s
Assumptions Used for Analysis	None		-		

A.3.1.5.2 Air-to-Surface Gunnery Test

Surface Warfar	e						
Air-to-Surface (Gunnery Test						
Short	This event is similar to the tr	raining event gunnery	Typical Dura	ntion			
Description	exercise air-to-surface. Fixed						
·	aircrews evaluate new or en						
	against surface maritime tar	_					
	gun, gun ammunition, or ass	sociated systems meet	2-2.5 flight r	ours per event			
	required specifications or to	train aircrew in the					
	operation of a new or enhar	nced weapons system.					
Long	Fixed-wing and rotary-wing	aircrews evaluate new o	r enhanced air	craft guns against surface			
Description	maritime targets to test that	t the gun, gun ammunitio	on, or associate	ed systems meet required			
	specifications or to train aird	crew in the operation of a	a new or enha	nced weapons system. Non-			
	explosive practice munitions	s are typically used during	g this type of t	est; however, a small number of			
	high explosive rounds may b	e used during final testir	ng. Rounds tha	t may be used include 7.62 mm,			
	20 mm, 30 mm, 0.30-caliber	, and 0.50-caliber gun an	nmunition.				
Typical	Platforms: Rotary-wing aircr	raft, fixed-wing aircraft, t	iltrotor aircraf	t			
Components	Targets: Surface targets						
	Systems being Trained/Test	ted: Gun systems					
Standard	Aircraft safety	Typical Locations					
Operating	Weapons firing safety	Range Complexes/Tes	Inland Waters/Pierside:				
Procedures		Jacksonville None					
(Section 2.3.3)		Virginia Capes					
Stressors to	Acoustic:	Physical Disturbance and Strike: Energy:					
Biological	Aircraft noise	Aircraft and aerial targets In-air electromagnetic					
Resources	Weapons noise	Underwater explosives devices					
		Military expended mat	erials				
	Explosives:			Entanglement:			
	Underwater explosives	Ingestion:	_	None			
		Military expended mat	erials –				
		munitions					
		Military expended mat	erials – other				
		than munitions					
Stressors to	Air Quality:	Sediments and Water Quality:					
Physical	Criteria air pollutants	Explosives Metals					
Resources	Habitata.						
	Habitats:						
	expended material						
	Underwater explosives						
Stressors to	Cultural Resources:	Socioeconomic Reso	nurces:	Public Health and Safety:			
Human	Cuiturai nesources.	Accessibility	Jui Ces.	Physical interactions			
Resources	Physical disturbance and	Accessibility Airborne acoustics		In-air energy			
Resources	strike	Physical disturbance	and strike	Underwater energy			
	Explosives	i ilysicai distarbance	and strike	onderwater energy			
	LAPIUSIVES						

Surface Warfar	e		
Air-to-Surface (Gunnery Test		
Military Expended Material	Ingestible Material: Medium-caliber projectile (explosive) fragments, target fragments, smalland medium-caliber projectiles (nonexplosive), small-caliber casings, medium-caliber casings Non-Ingestible Material: None	Military Recoverable Material	Recoverable surface targets
Sonar and Other Transducer Bins	None		
In-Water Explosive Bins	E1		
Procedural Mitigation Measures	Physical Disturbance and Strike: (Section 5.3.4) Small-, medium-, and large-caliber non-explosive practice munitions		ve Stressors: (Section 5.3.3) ve medium-caliber and large-caliber jectiles
Assumptions Used for Analysis	None		

A.3.1.5.3 Air-to-Surface Missile Test

C ()4/ (
Surface Warfar							
Air-to-Surface I	T						
Short	This event is similar to the t	_		Typical	Duration		
Description	exercise air-to-surface. Test	-					
	fixed-wing and rotary-wing		_				
	missiles at surface maritime	targets to eva	aluate 2	2-4 fligh	ht hours per event		
	the weapons system or as p	art of another	r systems				
	integration test.						
Long	Similar to a missile exercise	air-to-surface	, an air-to-sur	rface m	nissile test may involve both fixed-wing		
Description	and rotary-wing aircraft lau	nching missile	s at surface m	naritime	e targets to evaluate the weapons		
	system or as part of another	r systems inte	gration test. <i>A</i>	ir-to-s	surface missile tests can include high		
	explosive, non-explosive, or	non-firing (ca	ptive air train	ning mis	ssile) weapons. Laser targeting systems		
	may also be used. Both stat	onary and mo	bile targets w	vould b	oe utilized during testing.		
Typical	Platforms: Fixed-wing aircra						
Components	Targets: Surface targets	,	8				
	Systems being Trained/Test	t ed: Missile fir	ring/launching	g syster	ms		
Standard	Aircraft safety	Typical Loca		5 - 7			
Operating	Weapons firing safety		plexes/Testin	a Pana	ges: Inland Waters/Pierside:		
Procedures	Weapons ming sarety	Gulf of Mex	-	ig Nalig	None		
(Section 2.3.3)		Jacksonville			None		
(30001011 2.3.3)							
<u> </u>		Virginia Capes					
Stressors to	Acoustic:	Physical Disturbance and Strike: Energy:					
Biological	Aircraft noise	Aircraft and	In-air electromagnetic				
Resources	l	Underwater explosives devices					
	Explosives:	Military expended materials Lasers					
	Underwater explosives						
		Ingestion:			Entanglement:		
			ended mater	iais –	None		
		munition	-				
			ended mater	ials – o	other		
		than munitions					
Stressors to	Air Quality:			and Wa	ater Quality:		
Physical	Criteria air pollutants		Explosives				
Resources			Metals		Other materials		
	Habitats:						
	Physical disturbance and str	ike – military					
	expended material						
	Underwater explosives						
Stressors to	Cultural Resources:		nomic Resou	rces:	Public Health and Safety:		
Human		Accessibi	•		Physical interactions		
Resources	Physical disturbance and		acoustics	In-air energy			
	strike	Physical disturbance and strike Underwater ener					
	Explosives						
Military	Ingestible Material:		Military		Recoverable surface targets		
Expended	Missile (explosive) fragment	s, target	Recoverable	е			
Material	fragments		Material				
	Non-Ingestible Material:						
	Missiles (non-explosive)						

Surface Warfar	e			
Air-to-Surface I	Missile Test			
Sonar and Other Transducer Bins	None			
In-Water Explosive Bins	E6	E9	E10	
Procedural Mitigation Measures	Physical Disturband Non-explosive miss	•	tion 5.3.4)	Explosive Stressors: (Section 5.3.3) Explosive missiles and rockets
Assumptions Used for Analysis	None			

A.3.1.5.4 High-Energy Laser Weapons Test

Surface Warfa	20	-					
	ser Weapons Test						
				T		No	
Short	High-energy laser weapons			Туріса	al Durat	tion	
Description	the specifications, integration	-					
	of an aircraft mounted, app	1 7 E tlight h				ırs per event	
	high-energy laser. The laser				,		
	as a weapon to disable smal						
Long		weapons test, aircrew would evaluate the specifications, integration,					
Description	and performance of an aircr			-		= = = :	
		nmanned surface targets. The					
			-			60) either hovering or in forward	
					_	mobile. The high-energy laser	
		six kilometer	rs. Unmanne	ed surta	ace targ	gets would be used during the	
	high-energy laser test.	<u> </u>					
Typical	Platforms: Rotary-wing airc						
Components	Targets: Surface targets (sm	•					
	Systems being Trained/Tes						
Standard	Aircraft safety	Typical Loca					
Operating	Laser safety	Range Com		ing Ran	iges:	Inland Waters/Pierside:	
Procedures		Virginia Cap	es			None	
(Section							
2.3.3)		=					
Stressors to	Acoustic:	-	sturbance ar		œ:	Energy:	
Biological	Aircraft noise	Aircraft and	l aerial targe	ts		In-air electromagnetic	
Resources	Vessel noise				devices		
		Ingestion:		Lasers			
	Explosives:	Military exp	erials –	other			
	None	than munitions				Entanglement:	
		-	-			None	
Stressors to	Air Quality:		Sediment	s and V	Nater C	Quality:	
Physical	Criteria air pollutants		Metals	Ot	her ma	terials	
Resources							
	Habitats:						
	Physical disturbance and stri	ike –					
	military expended mater	ial					
Stressors to	Cultural Resources:	Socioe	conomic Res	ources	s:	Public Health and Safety:	
Human	Physical disturbance and stri		•			Physical interactions	
Resources		Airborn	ne acoustics			In-air energy	
		Physica	l disturbanc	e and s	trike		
Military	Ingestible Material:		Military		Remot	e-controlled surface targets	
Expended	Target fragments		Recoverab	le			
Material			Material				
	Non-Ingestible Material:						
	None						
Sonar and	None	-				-	
Other							
Transducer							
Bins							
פוווט							

Surface Warfar	Surface Warfare				
High-Energy La	ser Weapons Test				
In-Water	None				
Explosive					
Bins					
Procedural	None				
Mitigation					
Measures					
Assumptions	None				
Used for					
Analysis					

A.3.1.5.5 Laser Targeting Test

Surface Warfar	Δ						
Laser Targeting							
Short			Typical Dura	ation			
Description	Aircrews illuminate enemy to	argets with lasers.	4 flight hour				
Long	During a lacer targeting test	aircrows use laser targe	_				
Description	During a laser targeting test, aircrews use laser targeting devices integrated into aircraft or weapons systems to evaluate targeting accuracy and precision and to train aircrew in the use of						
Description	newly developed or enhanced laser targeting devices designed to illuminate designated targets for						
	engagement with laser-guided weapons. No explosive munitions are released during a laser targeting test.						
Typical	Platforms: Fixed-wing aircra	ft, rotary-wing aircraft, ti	It-rotor aircraf	t, unmanned aerial systems			
Components	Targets: Surface targets						
	Systems being Trained/Test	ed: Laser targeting syste	ems				
Standard	Aircraft safety	Typical Locations					
Operating		Range Complexes/Tes	ting Ranges:	Inland Waters/Pierside:			
Procedures		Virginia Capes		None			
(Section 2.3.3)							
Stressors to	Acoustic:	Physical Disturbance a		Energy:			
Biological	Aircraft noise	Aircraft and aerial targ		In-air electromagnetic			
Resources		Military expended mat	terials	devices			
	Explosives:	la sa ati a sa .		Lasers			
	None	Ingestion: None		Entanglement:			
		None		None			
Stressors to	Air Quality:	Sedimen	its and Water				
Physical	Criteria air pollutants	Metals					
Resources	, , , , , , , , , , , , , , , , , , ,						
	Habitats: Physical disturbance and strike – military						
	expended material						
Stressors to	Cultural Resources:	Socioeconomic Re	esources:	Public Health and Safety:			
Human	Physical disturbance and stri			Physical interactions			
Resources		Airborne acoustics		In-air energy			
B #1114	to an attal and a social.	Physical disturban					
Military	Ingestible Material:	Military		erable surface targets			
Expended Material	None	Recovera Material	ible				
iviateriai	Non-Ingestible Material:	iviateriai					
	Bombs (non-explosive)						
Sonar and	None						
Other							
Transducer							
Bins	Nana						
In-Water	None						
Explosive Bins							
Procedural	Physical Disturbance and Str	ike (Section 5 2 1)					
Mitigation	Non-explosive bombs and m	•					
Measures	14011 CAPIOSIVE DOITIDS ATIU III	me shapes					
IVICASUI CS							

Surface Warfar	Surface Warfare				
Laser Targeting	Test				
Assumptions	Military expended material may be non-explosive bombs or other guided munitions.				
Used for					
Analysis					

A.3.1.5.6 Rocket Test

Surface Warfar	e				
Rocket Test					
Short	Rocket tests are conducted t	to evaluate the	Typical Durat	ion	
Description	integration, accuracy, perfor separation of guided and un rockets fired from a hovering helicopter or tiltrotor aircraf	guided 2.75-inch g or forward flying	1.5-2.5 hours per event		
Long Description	of laser-guided and unguided Rocket tests would involve the explosive warhead rockets we motor and non-explosive water also conducted to train at may include variations of the Weapons System program of program as well as MEDUSA rockets. All rockets planned	d 2.75-inch rockets fired he release of primarily live vould be tested, and during the advantage of the vould be jettisoned ircrew on the use of new end at the volume of	from a hovering we motor/non-early a jettison teed along with the correction or enhanced warhead under the coped under Lowarhead rockets. Some	w-cost Guided Imaging Rocket	
Typical	Platforms: Rotary-wing aircr			<u> </u>	
Components	Targets: Surface targets Systems being Trained/Test		ng systems		
Standard	Aircraft safety	Typical Locations	8 - /		
Operating Procedures (Section 2.3.3)	Weapons firing safety	Range Complexes/Test Jacksonville Virginia Capes	ting Ranges:	Inland Waters/Pierside: None	
Stressors to Biological Resources	Acoustic: Aircraft noise Explosives: Underwater explosives	Physical Disturbance a Aircraft and aerial targ Underwater explosives Military expended mat Ingestion: Military expended mat munitions	ets s erials	Energy: In-air electromagnetic devices Entanglement: None	
Stressors to Physical Resources	Air Quality: Criteria air pollutants Habitats: Physical disturbance and striexpended materials Underwater explosives	Explosive Metals	_	Quality: emicals ner materials	
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike Explosives	Socioeconomic Reso Accessibility Airborne acoustics Physical disturbance		Public Health and Safety: Physical interactions In-air energy Underwater energy	

Surface Warfar	e			
Rocket Test				
Military Expended Material	Ingestible Material: Rocket (explosive) fragments, target fragments, flechettes Non-Ingestible Material: Rockets (non-explosive)	Military Recoverable Material	Remote controlled surface targets, stationary surface targets	
Sonar and Other Transducer Bins	None			
In-Water Explosive Bins	E3			
Procedural Mitigation Measures	Physical Disturbance and Strike: (Section 5.3.4) Non-explosive missiles and rockets Explosive Stressors: (Section 5.3.3) Explosive missiles and rockets			
Assumptions Used for Analysis	Assume 25 percent of non-explosive pract	ice munitions are	flechette rockets.	

A.3.1.6 Other Testing Activities

A.3.1.6.1 Acoustic and Oceanographic Research

Other Testing	Activities						
	Oceanographic Research						
Short	Active transmissions within	the band 10 he	ertz	Турі	cal Dura	ation	
Description	(Hz)-100 kilohertz (kHz) from sources deployed			8 flight hours per event			
	from ships and aircraft.						
Long	Active acoustic transmission						
Description				ls, cha	racteriza	ation of acoustic interactions	
	with the ocean bottom and						
Typical	Platforms: Fixed-wing aircr	•	i				
Component	Targets: Sub-surface target		au lacore e	do min	imic cor	aar systems	
S	Systems being Trained/Te			ae mir	iimis sor	iar systems	
Standard	Vessel safety	Typical Locati			_		
Operating Procedures	Aircraft safety	Range Compl		ing Ra	nges:	Inland Waters/Pierside:	
(Section		Gulf of Mexic	0			None	
2.3.3)		Jacksonville Key West					
2.5.5)		Northeast					
		Virginia Cape	c				
Stressors to	Acoustic:	Physical Dist		nd St	rike:	Energy:	
Biological	Aircraft noise	Aircraft and			ike.	In-air electromagnetic	
Resources	Vessel noise	Vessel and ir	_			devices	
	7 00001 110100					Lasers	
	Explosives:	Ingestion:					
	None	None				Entanglement:	
Stressors to	Air Quality	None Sediments and Water Quality:					
Physical	Air Quality: Criteria air pollutants		None	nts an	u water	Quanty:	
Resources	Criteria ali poliutarits	NOTIC					
Resources	Habitats:						
	None						
Stressors to	Cultural Resources:	Socioeco	nomic Re	sourc	es:	Public Health and Safety:	
Human	None	Accessib	ility			Physical interactions	
Resources		Airborne	acoustics			In-air energy	
		Physical	disturband	ce and			
		strik	е				
Military	Ingestible Material:		Military		None		
Expended	None		Recovera				
Material	Non-Ingestible Material:		Material				
	None						
Sonar and	None						
Other							
Transducer							
Bins	<u>-</u>			_		<u> </u>	
In-Water	None						
Explosive							
Bins							

Other Testing	Other Testing Activities		
Acoustic and	Oceanographic Research		
Procedural	Physical Disturbance and Strike: (Section 5.3.4)		
Mitigation	Vessel movement		
Measures			
Assumption	Lasers used are in-water, low-energy lasers.		
s Used for			
Analysis			

A.3.1.6.2 Air Platform Shipboard Integration Test

ctivities				
oboard Integration Test				
Aircraft are tested to determine	e operabili	ty from shipboard	Typical Duration	
platforms, performance of ship	board phy	sical operations,		
and to verify and evaluate com	municatio	ns and tactical data	2-12 flight hours per event	
links.				
			=	
_	unmanned	d aerial systems, tiltro	otor aircraft	
_	· Commun	ications systems		
Aircraft Safety				
	_	omplexes/Testing	Inland Waters/Pierside:	
	_	Canas	None	
	virginia	Capes		
Acoustic:	Physical	Disturbance and Stri	ke: Energy:	
Aircraft noise	-		In-air electromagnetic	
	, 0. 0. 0	a deriai targets	devices	
Explosives:	Ingestion	n:		
None	None		Entanglement:	
			None	
Air Quality:			Sediments and Water Quality:	
Criteria air pollutants			None	
			Public Health and Safety:	
None		•	Physical interactions	
			In-air energy	
Incontible Material	Physical			
		-	None	
None				
Non-Ingestible Material:		Waterial		
•				
None				
None				
None				
None				
	Acoustic: Aircraft noise Systems being Trained/Tested Aircraft noise Air Quality: Criteria air pollutants Acoustic: Aircraft noise Explosives: None Cultural Resources: None Cultural Resources: None Constitute Material: None None None	Acoustic: Aircraft noise Aircraft noise Aircraft noise Aircraft noise Air Quality: Criteria air pollutants Accessibi Airdraft noise Accessibi Aircraft noise Accessibi Airborne Alapstible Material: None Non-Ingestible Material: None None	Acoustic: Aircraft safety Aircraft safety Aircraft safety Aircraft and evaluate communications and tactical data links. Platforms shipboard integration test is performed to evaluate communications and tactical data links. The air platform shipboard integration test is performed to evaluate communications and tactical data links. The assessment of carrier-shipboard suitability, such as hazards of ordnance, hazard of electromagnetic radiation to personnel, a platforms: Fixed-wing aircraft, unmanned aerial systems, tiltrotargets: None Systems being Trained/Tested: Communications systems Aircraft safety Typical Locations Range Complexes/Testing Ranges: Virginia Capes Acoustic: Aircraft noise Aircraft and aerial targets Explosives: None None Air Quality: Criteria air pollutants Habitats: None Cultural Resources: None Military Recoverable Material None None	

Other Testing	Other Testing Activities			
Air Platform SI	hipboard Integration Test			
Assumptions	None			
Used for				
Analysis				

A.3.1.6.3 Maritime Security

Surface Warfard	9				
Maritime Secur					
	, ,	ticinata in mar	sition o T	mical Duna	±i.a.u
Short Description	Maritime patrol aircraft participate in maritime security activities and fleet training events. Aircraft identify, track, and monitor foreign merchant vessels suspected of non-compliance with United Nations-allied sanctions or conflict rules of engagement. Typical Duration 2-8 flight hours per event				
Long	Crews from Navy fixed-wing	aircraft ident	ify, track, and i	monitor for	reign merchant vessels suspected
Description	of not complying with United Nations-allied sanctions or conflict rules of engagement. This training event is non-firing. Naval Air Systems Command maritime patrol aircraft may participate in maritime security activities and training events.				
Typical	Platforms: Fixed-wing aircra	ıft			
Components	Targets: Mobile surface ves				
	Systems being Trained/Tes	ted: Radar sys	tems		
Standard	Vessel safety	Typical Loca	tions		
Operating Procedures (Section 2.3.3)	Aircraft safety	Range Complexes/Testing Ranges: Jacksonville Navy Cherry Point Virginia Capes			Bays/Estuaries/Pierside: None
Stressors to	Acoustic:	Physical Dis	turbance and	Strike:	Energy:
Biological	Aircraft noise	Aircraft and	aerial targets		In-air electromagnetic
Resources	Vessel noise	Vessel and i	n-water device	es	devices
	Explosives: None	Ingestion: None			Entanglement: None
Stressors to	Air Quality:		Sediments a	nd Water (Quality:
Physical Resources	Criteria air pollutants Habitats: None		None		
Stressors to	Cultural Resources:		nomic Resourc	ces:	Public Health and Safety:
Human	Physical disturbance and	Accessibi	•		Physical interactions
Resources	strike		acoustics disturbance and	d strike	In-air energy
Military	Ingestible Material:		Military	None	
Expended	None		Recoverable		
Material	Non-Ingestible Material: None		Material		
Sonar and	None	<u>.</u>			•
Other					
Transducer Bins					
In-Water Explosive Bins	None				

Surface Warfar	Surface Warfare				
Maritime Secur	rity Operations				
Procedural	None				
Mitigation					
Measures					
Assumptions	None				
Used for					
Analysis					

A.3.1.6.4 Shipboard Electronic Systems Evaluation

Other Testing A	Activities					
	tronic Systems Evaluation					
Short	Tests measure ship antenna	radiation patterns and	Typical Duration			
Description	test communication systems with a variety of aircraft.		2-20 flight hours per event			
Long Description	Shipboard electronic systems evaluation tests measure ship antenna radiation patterns and evaluate communication systems linking vessels and aircraft. Aircraft capable of landing on a ship (e.g., aircraft carrier or littoral combat ship) temporarily deploy to a nearshore ship and conduct a variety of tests over a period of days to test newly installed or modified systems onboard the aircraft for compatibility with shipboard electronic systems. Follow-on test and evaluation of unmanned aerial systems would consist of dynamic interface testing, shipboard electromagnetic testing, and envelope expansion tests intended to evaluate capability of aircraft to conduct launch and recovery operations from a ship at sea as well as perform missions in a maritime environment. Altitudes would range from mean seal level to 15,000 ft. above mean sea level with the majority of flights occurring between mean sea level and 3,000 ft.					
	Shipboard testing of new technology systems to provide precision guidance to aircraft landing on air capable ships. At-sea flight test of the aircraft would consist of shipboard compatibility (dynamic interface/envelope expansion) and, during Operational Evaluation, amphibious assault scenarios. Shipboard electronic systems evaluation tests of aircraft would also involve flight and wind envelope expansion interface testing with Amphibious Assault Ships, Amphibious Transport Dock, and Dock Landing Ship class vessels.					
Typical	Platforms: Rotary-wing aircraft, unmanned aerial systems					
Components	Targets: None					
	Systems being Trained/Tes		ems			
Standard	Aircraft safety	Typical Locations				
Operating	Unmanned aerial, surface,	Range Complexes/Test	ting Ranges: Inland Waters/Piers	side:		
Procedures	and subsurface vehicle	Gulf of Mexico	None			
(Section 2.3.3)	safety	Jacksonville				
		Key West				
		Virginia Capes				
Stressors to	Acoustic:	Physical Disturbance a	nd Strike: Energy:			
Biological	Aircraft noise	Aircraft and aerial targ	_	netic		
Resources			devices			
	Explosives:	Ingestion:				
	None	None	Entanglement:			
			None			
Stressors to	Air Quality:		ts and Water Quality:			
Physical	Criteria air pollutants	None				
Resources						
	Habitats:					
	None					
Stressors to	Cultural Resources:	Socioeconomic Re		-		
Human	None	Accessibility	Physical interactions	5		
Resources		Airborne acoustics				
		Physical disturban	ce and strike			

Other Testing Activities						
Shipboard Electronic Systems Evaluation						
Military	Ingestible Material:	Military	None			
Expended	None	Recoverable				
Material		Material				
	Non-Ingestible Material:					
	None					
Sonar and	None					
Other						
Transducer						
Bins						
In-Water	None					
Explosive						
Bins						
Procedural	None					
Mitigation						
Measures						
Assumptions	None	-				
Used for						
Analysis						

A.3.1.6.1 Undersea Range System Test

Other Testing A	ctivities						
Undersea Range	e System Test						
Short	Following installation of a N	avy undersea w	varfare	Typi	cal Dura	tion	
Description	training and testing range, to						
	(components of the range) a		to	8 ho	urs		
	include node surveys and te	sting of node		0110	uis		
Lana	transmission functionality.	<u> </u>					
Long Description	The bottom-mounted bi-dire tested to establish system p		•	•		lation utilizing a range pinger a Each acoustic projector is	and
	-			_	_	ophones. The nodes may also	be
						following significant weather	
		es are located co	orrectly an	d fund	tioning	properly prior to ongoing train	ıing
	or testing.						
Typical	Platforms: Surface vessels Targets: None						
Components	Systems being Trained/Test	ted: Undersea r	ange instri	ument	ation		
Standard	Vessel safety	Typical Locati		arrierre	dtion		
Operating		Range Comp		ing Ra	nges:	Inland Waters/Pierside:	
Procedures		Jacksonville	•	Ū	J	None	
(Section 2.3.3)							
Stressors to	Acoustic:	Physical Dist			ike:	Energy:	
Biological	Sonar and other	Vessels and i	n-water de	evices		In-air electromagnetic	
Resources	transducers Vessel noise	Ingestion:				devices	
	V C S C I TI O I S C	None				Entanglement:	
	Explosives:					None	
	None						
Stressors to	Air Quality:		Sediment	ts and	Water (Quality:	
Physical Resources	Criteria air pollutants		None				
Resources	Habitats:						
	None						
Stressors to	None					-	
Human							
Resources		· · · · · · · · · · · · · · · · · · ·					
Military	Ingestible Material:		Military		None		
Expended Material	None		Recoveral	bie			
iviateriai	Non-Ingestible Material:	Material					
	None						
Sonar and	None						
Other							
Transducer							
Bins							
In-Water	None						
Explosive Bins							
פוווט							

Other Testing A	Other Testing Activities					
Undersea Rang	e System Test					
Procedural Mitigation Measures	Physical Disturbance and Strike: (Section 5.3.4) Vessel movement	Acoustic Stressors: (Section 5.3.2) Active sonar				
Assumptions Used for Analysis	The duration of the node survey varies.					

A.3.2 NAVAL SEA SYSTEMS COMMAND TESTING ACTIVITIES

A.3.2.1 Anti-Submarine Warfare

A.3.2.1.1 Anti-Submarine Warfare Mission Package Testing

Anti-Submarine	· Warfare					
Anti-Submarine	Warfare Mission Package Te	sting				
Short	Ships and their supporting p	latforms (rotary-wing	Typical Dura	ration		
Description	aircraft and unmanned aeria	al systems) detect,	1-2 weeks, w	vith 4-8 hours of active sonar use		
	localize, and prosecute subr	narines.	with interval	s of non-activity in between		
Long	Littoral combat ships condu		_			
Description	_			ed and unmanned). Active and		
	passive acoustic systems are			argets, culminating in the		
	deployment of lightweight t		hreat.			
Typical	Platforms: Rotary-wing airci					
Components	Targets: Sub-surface targets					
	Systems being Trained/Test	ted: Sonar systems, coun	termeasure sy	stems, torpedo systems,		
a	sonobuoys					
Standard	Vessel safety	Typical Locations				
Operating	Aircraft safety	Range Complexes/Test	ting Ranges:	Inland Waters/Pierside:		
Procedures (Section 2.3.3)	Towed in-water device	Jacksonville		Newport, Rhode Island		
(Section 2.3.3)	safety	Virginia Capes	6 .			
		Naval Undersea Warfa	re Center			
Ct	A	Division, Newport		F		
Stressors to	Acoustic:	Physical Disturbance a		Energy:		
Biological Resources	Sonar and other transducers	Aircraft and aerial targ Vessels and in-water d		In-air electromagnetic devices		
Resources	Aircraft noise	Military expended mat		devices		
	Vessel noise	wiiitary expended mat	eriais	Entanglement:		
	vesser noise	Ingestion:		Wires and cables		
	Explosives:	Military expended mat	erials – other	Decelerators/parachutes		
	None	than munitions	eriais other	Decererators, paraerrates		
Stressors to	Air Quality:		ts and Water (Ouality:		
Physical	Criteria air pollutants	Chemical		letals		
Resources	•	Other ma	aterials			
	Habitats:					
	Physical disturbance and stri	ke – military				
	expended material	•				
Stressors to	Cultural Resources:	Socioeconomic Reso	ources:	Public Health and Safety:		
Human	Physical disturbance and	Accessibility		Physical interactions		
Resources	strike	Airborne acoustics		In-air energy		
		Physical disturbance	and strike	Underwater energy		

Anti-Submarine	Warfare				
Anti-Submarine	Warfare Missi	ion Package T	esting		
Military	Ingestible Ma	aterial:		Military	Lightweight torpedoes (non-explosive),
Expended	Small deceler	ators/parachu	ıtes,	Recoverable	recoverable sub-surface targets
Material	parachutes	-medium		Material	
Sonar and	targets, exp bathytherm	on-explosive) endable sub-subendable nographs, exp nograph wires cessories	urface endable , lightweight	marine Warfare:	Torpedoes:
Other	MF1	MF5	ASW1	ASW3	TORP1
Transducer	MF4	MF12	ASW2	ASW5	
Bins		-	 		
In-Water Explosive Bins	None				
Procedural	Acoustic Stre	ssors: (Sectior	n 5.3.2)	Physica	l Disturbance and Strike: (Section 5.3.4)
Mitigation	Active sonar				
Measures					in-water devices
Assumptions	All sonobuoys	have parachi	utes unless oth	erwise noted.	
Used for					
Analysis					

A.3.2.1.2 At-Sea Sonar Testing

Anti-Submarine	Warfare					
At-Sea Sonar Te						
Short	1	toms are fully	Typical Durat	tion		
Description	At-sea testing to ensure syst					
•	functional in an open ocean environment. From 4 hours to 11 days At-sea sonar testing is required to calibrate or document the functionality of sonar and torpedo					
Long Description	systems while the ship or su			•		
Description	conducted to verify the ship			=		
	characteristics of the ship, d					
	characteristics, and provide					
	-		-	ort measurement, photonics,		
				passive detection capability is		
	-	=		ped with a noise augmentation		
	system in order to replicate	acoustic or electromagn	etic signatures	of other vessel types or classes.		
Typical	Platforms: Submarines, surf	ace combatants, surface	support craft			
Components	Targets: Sub-surface targets					
	Systems being Trained/Test	ted: Sonar systems, acou	stic counterme	asures, sonobuoys, acoustic		
	modems, torpedo systems,	underwater communicat	ion systems, el	ectromagnetic devices		
Standard	Vessel safety	Typical Locations				
Operating	Aircraft safety	Range Complexes/Tes	ting Ranges:	Inland Waters/Pierside:		
Procedures	Towed in-water device	Gulf of Mexico		None		
(Section 2.3.3)	safety	Jacksonville				
	,	Navy Cherry Point				
	,	Northeast				
	,	Virginia Capes				
	,	Naval Undersea Warfa	re Center			
	,	Division, Newport				
	,	South Florida Ocean M	leasurement			
	,	Facility	Flavida			
<u> </u>		Offshore of Fort Pierce				
Stressors to	Acoustic:	Physical Disturbance a		Energy:		
Biological	Sonar and other	Aircraft and aerial targ Vessels and in-water d		In-water electromagnetic devices		
Resources	transducers Aircraft noise	Military expended mat		In-air electromagnetic		
	Vessel noise	willitary experiued mai	leriais	devices		
	vesser noise	Ingestion:		devices		
	Explosives:	Military expended mat	erials – other	Entanglement:		
	None	than munitions		Wires and cables		
				Decelerators/parachutes		
Stressors to	Air Quality:	Sedimen	ts and Water C	•		
Physical	Criteria air pollutants	Metals	Chem			
Resources		Other m	aterials			
	Habitats:					
	Physical disturbance and stri	ke – military				
	expended material					
Stressors to	Cultural Resources:	Socioeconomic Re	esources:	Public Health and Safety:		
Human	Physical disturbance and stri	· · · · · · · · · · · · · · · · · · ·		Physical interactions		
Resources		Physical disturban	ce and strike	In-air energy		
				Underwater energy		

Anti-Submarine	Warfare					
At-Sea Sonar To	esting					
Military	Ingestible	Material:		Military	Acoustic countermea	sures,
Expended	Small dece	elerators/parachu	utes	Recoverable	electromagnetic de	evices, heavyweight
Material				Material	torpedoes (non-ex	olosive)
	Non-Inges	tible Material:				
		le bathythermogr	•			
		able bathythermo				
	heavywe	eight torpedo acc	cessories,			
	sonobuo	oys (non-explosiv	e), sonobuoy			
	wires, m	notorized autono	mous targets			
Sonar and	Mid-Frequ	iency:	Low-Fre	quency:	Anti-Submar	ine Warfare:
Other	MF1	MF5	LF5		ASW3	ASW4
Transducer	MF1K	MF9				
Bins	MF3		High-Fre	quency:	Acoustic Mo	dems:
			HF1		M3	
	Torpedoes	5:				
	TORP2					
In-Water	None					
Explosive						
Bins						
Procedural	Acoustic S	tressors: (Section	n 5.3.2)	Phys	ical Disturbance and Stri	ke: (Section 5.3.4)
Mitigation	Active son	ar		Vesse	el movement	
Measures				Towe	ed in-water devices	
Assumptions	Active son	ar use is intermit	tent throughou	ıt the duration	of the event.	
Used for						
Analysis						

A.3.2.1.3 Countermeasure Testing

Anti-Submarine	e Warfare					
Countermeasur	e Testing					
Short	Countermeasure testing inv	olves the testing of	Typical Durat	tion		
Description	systems that will detect, loc incoming weapons, includin targets. Testing includes sur defense systems and marine payloads.	alize, and track g marine vessel face ship torpedo	From 4 hours to 6 days, depending on the countermeasure being tested			
Long Description	Countermeasure testing involves the testing of systems that will detect, localize, and track incoming weapons, including marine vessel targets. At-sea testing of the Surface Ship Torpedo Defense systems includes towed acoustic systems, torpedo warning systems, and countermeasure anti-torpedo subsystems. Some countermeasure scenarios would employ non-explosive torpedoes against targets released by secondary platforms (helicopter or submarine). While surface vessels are in transit, countermeasure systems may be used to identify false alert rates. Testing of the Maritime Vessel Stopping payloads will deliver the appropriate measure(s) to affect a target vessel's propulsion and associated control surfaces to significantly slow and potentially stop the advance of the vessel.					
Typical	Platforms: Aircraft carriers,	support craft, surface com	nbatants			
Components	Targets: Sub-surface targets	s, surface targets				
	Systems being Trained/Tes	ted: Sonar systems, count	ermeasures, t	orpedo systems		
Standard	Vessel safety	Typical Locations				
Operating	Towed in-water device	Range Complexes/Testi	ng Ranges:	Inland Waters/Pierside:		
Procedures	safety	Key West		None		
(Section 2.3.3)		Gulf of Mexico				
		Jacksonville				
		Northeast				
		Virginia Capes				
		Naval Undersea Warfare	e Center			
		Division, Newport				
Stressors to	Acoustic:	Physical Disturbance an	ıd Strike:	Energy:		
Biological	Sonar and other	Vessels and in-water de	vices	In-air electromagnetic		
Resources	transducers	Military expended mate	rials	devices		
	Vessel noise					
		Ingestion:		Entanglement:		
	Explosives:	Military expended mate	rials – other	Wires and cables		
	None	than munitions		Decelerators/parachutes		
				Biodegradable polymer		
Stressors to	Air Quality:	Sediments	s and Water C	Quality:		
Physical	Criteria air pollutants	Metals	Chemi	icals		
Resources		Other mat	terials			
	Habitats:					
	Physical disturbance and str	ike – military				
	expended material					
Stressors to	Cultural Resources:	Socioeconomic Resou	urces:	Public Health and Safety:		
Human	Physical disturbance and	Accessibility		Physical interactions		
_	-					
Resources	strike	Physical disturbance a	and strike	In-air energy Underwater energy		

Anti-Submarine	e Warfare		
Countermeasu	re Testing		
Military Expended Material	Ingestible Material: Biodegradable polymer Non-Ingestible Material: Acoustic countermeasures, heavyweight torpedo accessories, lightweight torpedo accessories	Military Recoverable Material	Heavyweight torpedoes (non- explosive), lightweight torpedoes (non-explosive)
Sonar and Other Transducer Bins	High-Frequency: Anti-Suk HF5 ASW3	omarine Warfare:	Torpedoes: TORP1 TORP2
In-Water Explosive Bins	None		
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3.2) Active sonar	vsical Disturbance and Strike: (Section 5.3.4) sel movement ved in-water devices	
Assumptions Used for Analysis	Not all events will include the use of sonar	and other transd	ucers.

A.3.2.1.4 Pierside Sonar Testing

Anti-Submarine	e Warfare					
Pierside Sonar	Testing					
Short	D: .1: .			Typic	cal Durat	tion
Description	Pierside testing to ensure sy functional in a controlled pie prior to at-sea test activities	erside environ	-	Up to 3 weeks total per ship, with each source run independently and not continuously during this time		
Long Description	Ships and submarines would activate mid- and high-frequency tactical sonars, underwater communications systems, and navigational devices to ensure they are fully functional prior to at-sea test events. Testing may also include the firing of inert torpedo shapes. Event duration varies; with average durations of 3 weeks with active sonar used intermittently over 2 days during the total event duration. This also includes pierside sonar testing during surface combatant sea trials.					
Typical	Platforms: Moored platform	ns, submarine:	s, surface co	ombata	ants	
Components	Targets: None Systems being Trained/Test systems	ted: Sonar sys	tems, acous	stic mo	odems, u	underwater communication
Standard	None	Typical Loca	tions			
Operating Procedures (Section 2.3.3) Stressors to Biological Resources Stressors to	Acoustic: Sonar and other transducers Explosives: None Air Quality:	Physical Dis None Ingestion:		nd Str	ike:	Inland Waters/Pierside: Bath, Maine Groton, Connecticut Kings Bay, Georgia Newport, Rhode Island Norfolk, Virginia Pascagoula, Mississippi Port Canaveral, Florida Portsmouth, New Hampshire Energy: None Entanglement: None
Physical Resources	None Habitats: None		None	ts and		, and the second se
Stressors to Human Resources	Cultural Resources: None	Socioeco None	nomic Reso	ources:		Public Health and Safety: Underwater energy
Military Expended Material	Ingestible Material: None Non-Ingestible Material: None		Military Recoveral Material	ble	None	

Anti-Submarine	Anti-Submarine Warfare							
Pierside Sonar	Pierside Sonar Testing							
Sonar and	Mid-Freq	uency:	High-Fred	juency:	Acoustic Modems:			
Other	MF1	MF9	HF1	HF8	M3			
Transducer	MF1K	MF10	HF3					
Bins	MF3				Anti-Submarine Warfare:			
					ASW3			
In-Water	None							
Explosive								
Bins								
Procedural	Acoustic S	Stressors: (Section	n 5.3.2)	-	•			
Mitigation	Active sor	nar						
Measures								
Assumptions	Event dur	ation is 3 weeks v	vith active sonar	used intermittent	tly.			
Used for	The facilit	y platform may b	e a dock or othe	r structure.				
Analysis								

A.3.2.1.5 Submarine Sonar Testing/Maintenance

Anti-Submarine	Warfare				
	ar Testing/Maintenance				
Short	Pierside testing of submarir	ne systems occ	curs	Typical Dura	tion
Description	periodically following major				weeks, with intermittent use of
	and for routine maintenance			active sonar	vecto, with intermittent use of
Long			e periods, pi	erside and at	-sea testing and maintenance is
Description					es such as navigation systems,
·					istress beacons, range finders, and
	other similar systems, will b	e tested.	•		-
Typical	Platforms: Submarines				
Components	Targets: None				
	Systems being Trained/Tes	sted: Sonar sys	stems, acous	stic modems	
Standard	Vessel safety	Typical Loca	itions		
Operating		Range Com	plexes/Testi	ing Ranges:	Inland Waters/Pierside:
Procedures		None			Norfolk, Virginia
(Section					Portsmouth, New Hampshire
2.3.3)		<u> </u>			
Stressors to	Acoustic:	-	sturbance ar		Energy:
Biological	Sonar and other	Vessels and	l in-water de	vices	None
Resources	transducers				
	Vessel noise	Ingestion:			Entanglement:
	Fundanium	None			None
	Explosives: None				
Stressors to	Air Quality:		Sediment	s and Water	Quality:
Physical	None None		None	s and water	Quality.
Resources					
	Habitats:				
	None				
Stressors to	Cultural Resources:	Socioe	conomic Res	ources:	Public Health and Safety:
Human	None	Physica	al disturbanc	e and strike	Underwater energy
Resources		<u>-</u>	1		Physical interactions
Military	Ingestible Material:		Military	None	
Expended	None		Recoverab	le	
Material			Material		
	Non-Ingestible Material: None				
Camanand		Iliah Fua			A a constitue BA a diamana
Sonar and Other	Mid-Frequency: MF3	High-Fre HF1	equency: HF3		Acoustic Modems: M3
Transducer	IVII 3	111 1	1113		IVIS
Bins					
In-Water	None				
Explosive	.				
Bins					
Procedural	Acoustic Stressors: (Section	5.3.2)	Ph	vsical Distur	bance and Strike: (Section 5.3.4)
				,	
Mitigation	Active sonar	,		ssel moveme	

Anti-Submarine	Anti-Submarine Warfare				
Submarine Son	ar Testing/Maintenance				
Assumptions	Sonar would not be used continuously throughout the duration of the test.				
Used for	For biological resource analysis, vessel noise and vessel strike are only analyzed for the periods while				
Analysis	the submarines are surfaced, typically brief in nature. Mitigation measures related to vessel movement are only considered during the period of surfacing as well. For human resource stressor analysis, physical disturbance and strike and physical interactions are				
	only analyzed for the periods while the submarine are surfaced, typically brief in nature.				

A.3.2.1.6 Surface Ship Sonar Testing/Maintenance

Anti-Submarin	e Warfare					
	onar Testing/Maintenance					
Short	Pierside and at-sea testing	of ship system	S	Турі	ical Dura	tion
Description	occurs periodically followir	ng major maint	enance	Up t	o 3 weel	ks, with intermittent use of
	periods and for routine ma	ods and for routine maintenance. active sonal			ve sonar	
Long	Following major and routir	ne maintenance	e periods	, piers	ide and	at-sea testing and maintenance
Description	is required. Multiple syster	ms with active and passive acoustic sources such as tactical sonar,				
	navigation systems, fathon	meters, underwater communications systems, underwater distress				
	beacons, range finders, and	d other similar	systems,	will b	e tested	•
Typical	Platforms: Surface combat	tants				
Components	Targets: None					
	Systems being Trained/Te	sted: Sonar sys	stems, ac	oustic	counter	measures, underwater
	communication systems					
Standard	Vessel safety	Typical Locat				
Operating		Range Comp	lexes/Te	sting		Inland Waters/Pierside:
Procedures		Ranges:				Mayport, Florida
(Section		Jacksonville				Norfolk, Virginia
2.3.3)		Virginia Capes				
Stressors to	Acoustic:	Physical Dist				Energy:
Biological	Sonar and other	Vessels and i	n-water	device	25	In-air electromagnetic
Resources	transducers	_				devices
	Vessel noise	Ingestion:				
	Foods about	None				Entanglement:
	Explosives: None					None
Stressors to		-	C = d! =		d 14/545	Overlie
Physical	Air Quality: Criteria air pollutants		None	its and	u water	Quality:
Resources	Criteria ali poliutarits		None			
nesources	Habitats:					
	None					
Stressors to	Cultural Resources:	Socioecon	omic Res	source	es:	Public Health and Safety:
Human	Physical disturbance and	Accessibili				Physical interactions
Resources	strike	Physical di	•	e and	strike	In-air energy
		,				Underwater energy
Military	Ingestible Material:		Military		None	<u> </u>
Expended	None		Recovera	able		
Material			Material			
	Non-Ingestible Material:					
	None					
Sonar and	Mid-Frequency:	Anti-Subn	narine W	/arfare	e:	
Other	MF1 MF9	ASW3				
Transducer	MF1K MF10					
Bins						
In-Water	None					
Explosive						
Bins						

Anti-Submarin	Anti-Submarine Warfare					
Surface Ship So	onar Testing/Maintenance					
Procedural Mitigation Measures	Active sonar	Physical Disturbance and Strike: (Section 5.3.4) Vessel movement				
Assumptions Used for Analysis	Sonar will not be continuously active for	the duration of the test.				

A.3.2.1.7 Torpedo (Explosive) Testing

Anti-Submarine	. Warfare			
Torpedo (Explo				
Short	Air, surface, or submarine ci	rews employ explosive	Typical Du	ration
Description	and non-explosive torpedoes against artificial targets.		1-2 days during daylight hours	
Long Description	Non-explosive and explosive torpedoes (carrying a warhead) will be launched at a suspended target by a submarine and fixed- or rotary-wing aircraft or surface combatants. Event duration is 1 to 2 days during daylight hours.			
Typical Components	Platforms: Fixed-wing aircra surface combatants Targets: Sub-surface targets Systems being Trained/Tes systems	s, surface targets ted: Sonar systems, acou		craft, submarines, support craft, neasures, sonobuoys, torpedo
Standard	Vessel safety	Typical Locations		
Operating Procedures (Section 2.3.3)	Aircraft safety Weapons firing safety	Range Complexes/Tes Gulf of Mexico Jacksonville Key West Navy Cherry Point Northeast Virginia Capes Offshore of Fort Pierce		Inland Waters/Pierside: None
Stressors to	Acoustic:	Physical Disturbance a	nd Strike:	Energy:
Biological	Sonar and other	Aircraft and aerial targ		In-air electromagnetic
Resources	transducers	Underwater explosives	5	devices
	Aircraft noise	Vessels and in-water d	evices	
	Vessel noise	Military expended mat	terials	Entanglement: Wires and cables
	Explosives:	Ingestion:		Decelerators/parachutes
	Underwater explosives	Military expended mat	erials –	
		munitions		
		Military expended mat	erials – othe	r
		than munitions		
Stressors to	Air Quality:		t and Water	•
Physical	Criteria air pollutants	Explosive		Chemicals
Resources	Habitats:	Metals	(Other materials
	Physical disturbance and str expended material Underwater explosives	ike – military		
Stressors to	Cultural Resources:	Socioeconomic Reso	ources:	Public Health and Safety:
Human		Accessibility		Physical interactions
Resources	Physical disturbance and	Airborne acoustics		In-air energy
	strike	Physical disturbance	and strike	Underwater energy
	Explosives			

Anti-Submarine	e Warfare				
Torpedo (Explo	sive) Testing				
Military Expended Material	Ingestible Material: Small decelerators/parachutes, parachutes-medium, target fragments, heavyweight and lightweight torpedo (explosive) fragments	mall decelerators/parachutes, parachutes-medium, target fragments, heavyweight and lightweight torpedo (explosive)		Heavyweight torpedo explosive), lightwei (non-explosive)	•
Sonar and Other Transducer	MF1 MF5 HI MF3 MF6 H	ters igh-Frequency:	F6	Torpedoes: TORP1	TORP2
Bins	MF4	nti-Submarine \	Narfare:		
	AS	SW3			
In-Water Explosive Bins	E8 E11	·			
Procedural Mitigation Measures	Active sonar Physical Disturbance and Strike: (Section 5.3.4) Vessel movement Explosive Stressors: (Section 5.3.3) Explosive torpedoes				
Assumptions Used for Analysis	All sonobuoys have parachutes unless otherwise noted. Only one heavyweight torpedo test could occur in 1 day; two heavyweight torpedo tests could occur on consecutive days. Two lightweight torpedo tests could occur in a single day. All non-explosive torpedoes are recovered.				

A.3.2.1.8 Torpedo (Non-Explosive) Testing

Anti-Submarine	e Warfare						
	Explosive) Testing						
Short	Air, surface, or submarine c	rews employ non-	Typical Dura	tion			
Description	explosive torpedoes against vessels.	submarines or surface	Up to 2 weel	«s			
Long Description	Aerial, surface, and subsurface assets fire exercise torpedoes against surface or subsurface targets or at no target and programmed with a particular run geometry. Torpedo testing evaluates the performance and the effectiveness of hardware and software upgrades of heavyweight or lightweight torpedoes. It also includes testing of experimental torpedoes. Not all torpedo tests involve acoustics. Exercise torpedoes are recovered, typically from surface ships and helicopters that are specifically crewed and outfitted for torpedo recovery. Event duration is dependent on number of torpedoes fired.						
Typical Components	Platforms: Fixed-wing patro craft, surface combatants Targets: Sub-surface targets Systems being Trained/Tes	s, surface targets ted: Sonar systems, acou	·	ng aircraft, submarines, support easures, sonobuoys, torpedoes			
Standard	Vessel safety	Typical Locations					
Operating	Aircraft safety	Range Complexes/Test	ting Ranges:	Inland Waters/Pierside:			
Procedures	Weapons firing safety	Gulf of Mexico None					
(Section 2.3.3)		Navy Cherry Point					
		Northeast					
		Virginia Capes					
		Naval Undersea Warfa	re Center				
		Division, Newport	Elevisia.				
_		Offshore of Fort Pierce					
Stressors to	Acoustic:	Physical Disturbance a		Energy:			
Biological	Sonar and other	Aircraft and aerial targ		In-air electromagnetic			
Resources	transducers	Vessels and in-water d		devices			
	Aircraft noise	Military expended mat	erials				
	Vessel noise			Entanglement:			
	Familia di casa	Ingestion:		Wires and cables			
	Explosives: None	Military expended mat than munitions	eriais – otner	Decelerators/parachutes			
Stressors to			t and Water Q	huality			
Physical	Air Quality: Criteria air pollutants	Sedimen Metals		quanty: nemicals			
Resources	Cinteria ali pollutarits	Other ma	_	ienneais			
ilesources	Habitats:	Other me	accitats				
	Physical disturbance and str	strika – military					
	expended materials	ike mineary					
Stressors to	Cultural Resources:	Socioeconomic Reso	ources:	Public Health and Safety:			
Human	Physical disturbance and	Accessibility	Jui 003.	Physical interactions			
Resources	strike	Airborne acoustics		In-air energy			
Resources	SUINC	Physical disturbance	and strike	Underwater energy			
		r nysicai disturbance	and strike	Onderwater energy			

Anti-Submarine	· Warfare		
Torpedo (Non-	Explosive) Testing		
Military Expended Material	Ingestible Material: Small decelerators/parachutes, parachutes-medium Non-Ingestible Material: Expendable acoustic countermeasures expendable bathythermographs, expendable bathythermograph, wires, heavyweight torpedo accessories, lightweight torpedo accessories, sonobuoys (non- explosive), sonobuoy wires, canister motorized autonomous targets,		Heavyweight and lightweight torpedoes (non-explosive), acoustic countermeasures
Sonar and Other Transducer Bins	MF1 MF5 HF1 MF3 MF6 MF4 Anti-	Frequency: HF6 Submarine Warfare	Torpedoes: TORP1 TORP2
In-Water Explosive Bins	None ASW3	ASW4	
Procedural Mitigation Measures	Active sonar		al Disturbance and Strike: (Section 5.3.4) movement
Assumptions Used for Analysis	All torpedoes are recovered. Events can last up to two weeks and us torpedoes are fired per day during	·	es. Typically, no more than eight

A.3.2.2 Electronic Warfare

A.3.2.2.1 Radar and Other System Testing

Electronic Warf	are					
Radar and Othe	er System Testing					
Short	Test may include radiation of	f military or	Typical Dura	ation		
Description	commercial radar, communic	="	. ypicai zaia			
Description	simulators), or high-energy la		12 hours per day over a 7-day period			
	occur aboard a ship against o					
	rockets, missiles, or other tai					
Long		nay include radiation of military or commercial radar, communication				
Description	_	•	•	mission will occur during this		
Description				anned aerial vehicles, missiles, or		
		_	•	opelled vessels). High-energy		
			-	with single or multiple targets.		
Tunical						
Typical	_	· · · · · · · · · · · · · · · · · · ·	rt, small boats,	, submarines, surface combatants		
Components	Targets: Air targets, surface t	_				
	Systems being Trained/Test		asers			
Standard	Vessel safety	Typical Locations		-		
Operating	Aircraft safety	Range Complexes/Test	ting Ranges:	Inland Waters/Pierside:		
Procedures	High-energy laser safety	Gulf of Mexico		Groton, Connecticut		
(Section 2.3.3)	Towed in-water device	Jacksonville		Joint Expeditionary Base Little		
	safety	Key West		Creek, Virginia		
		Navy Cherry Point		Norfolk, Virginia		
		Northeast				
		Virginia Capes				
		Naval Surface Warfare	-			
		Panama City Divisio	n			
		Naval Undersea Warfa	re Center			
		Division, Newport				
		South Florida Ocean M	leasurement			
		Facility				
Stressors to	Acoustic:	Physical Disturbance a	ınd Strike:	Energy:		
Biological	Aircraft noise	Aircraft and aerial targ	ets	In-air electromagnetic		
Resources	Vessel noise	Vessels and in-water d	evices	devices		
		Military expended mat	erials:	In-water electromagnetic		
	Explosives:			devices		
	None	Ingestion:		Lasers		
		Military expended mat	:erials –			
		munitions		Entanglement:		
		Military expended mat	erials – other	None		
		than munitions				
Stressors to	Air Quality:	Sedimen	ts and Water	Quality:		
Physical	Criteria air pollutants	Metals	Other mat	terials		
Resources						
	Habitats:					
	Physical disturbance and strik	ke – military				
	expended material					
Stressors to	Cultural Resources:	Socioeconomic Re	esources:	Public Health and Safety:		
Human	Physical disturbance and strik	ke Accessibility		Physical interactions		
Resources		Airborne acoustics	3	In-air energy		
				- /		

Electronic Warf	are				
Radar and Othe	er System Testing				
	Physica	l disturbance and	strike Underwater energy		
Military Expended Material	Ingestible Material: Per chaff: one chaff-air cartridge, one plastic endcap, one compression pad or one plastic piston, chaff fibers; missile (explosive) fragments; target fragments Non-Ingestible Material: Missiles (non-explosive), kinetic energy rounds, sabots, expendable aerial drones, expendable surface targets	Military Recoverable Material	Recoverable surface targets, recoverable aerial drones		
Sonar and Other Transducer Bins	None				
In-Water Explosive Bins	None				
Procedural Mitigation Measures	Physical Disturbance and Strike: (Section 5.3.4) Vessel movement Non-explosive missiles and rockets				
Assumptions Used for Analysis	All explosive missiles detonate in air during High-energy lasers will not be tested piers				

A.3.2.3 Mine Warfare

A.3.2.3.1 Mine Countermeasure and Neutralization Testing

Mine Warfare						
Mine Countern	measure and Neutralization Te	esting				
Short			Typical Dura	ation		
Description	Air, surface, and subsurface	vessels neutralize	1-10 days, with intermittent use of			
	threat mines and mine-like	objects.	countermeasure/neutralization systems durin			
			this period	,		
Long	Mine countermeasure-neut	Mine countermeasure-neutralization and mine system testing is required to ensure systems can				
Description		at (live or inert) mines that will otherwise restrict passage through an area				
	and to ensure U.S. Navy mir	nes remain effective agai	nst enemy shi	ps. These systems may be		
	deployed with a variety of s	f ships, aircraft, submarines, or unmanned autonomous vehicles and				
	operate in water depths up	to 6,000 feet. Mines are	neutralized by	y cutting mooring cables of		
	buoyant mines, producing a	acoustic energy that fires	acoustic-influ	ence mines, employing radar or		
	laser fields, producing elect	rical energy to replicate	the magnetic s	signatures of surface ships in order		
	to detonate threat mines, d	etonation of mines using	g remotely-op	erated vehicles, and using		
	explosive charges to destroy	y threat mines.				
Typical	Platforms: moored platform	ns, rotary-wing aircraft				
Components	Targets: Air targets, mine sh	napes				
	Systems being Trained/Tes	ted: Electromagnetic de	vices, radar, lo	w energy lasers		
Standard	Vessel safety	Typical Locations				
Operating	Aircraft safety	Range Complexes/Tes	ting Ranges:	Inland Waters/Pierside:		
Procedures	Unmanned aerial, surface,	Virginia Capes		None		
(Section	and subsurface vehicle	Naval Surface Warfare Center,				
2.3.3)	safety	Panama City Division	on			
	Towed in-water device	South Florida Ocean Measurement				
	safety	Facility				
Stressors to	Acoustic:	Physical Disturbance a	and Strike:	Energy:		
Biological	Sonar and other	Aircraft and aerial targ	gets	In-water electromagnetic		
Resources	transducers	Underwater explosive	S	devices		
	Aircraft noise	Vessels and in-water of	levices	In-air electromagnetic		
	Vessel noise	Military expended ma	terials	devices		
		Seafloor devices		Lasers		
	Explosives:					
	Underwater explosives	Ingestion:		Entanglement:		
		Military expended ma	terials –	Wires and cables		
		munitions				
Stressors to	Air Quality:		it and Water (-		
Physical	Criteria air pollutants	Explosive		1etals		
Resources		Other m	aterials			
	Habitats:					
	Physical disturbance and str	ike – military				
	expended material	:1				
	Physical disturbance and str	ike –				
	seafloor devices					
	Underwater explosives			5.111.11.111.15.6		
Stressors to	Cultural Resources:	Socioeconomic Res	ources:	Public Health and Safety:		
Human	No orient dieta	Accessibility		Physical interactions		
Resources	Physical disturbance and	Airborne acoustics	والتنام امرم	In-air energy		
	strike	Physical disturbance	e and strike	Underwater energy		

Mine Warfare						
Mine Countern	Mine Countermeasure and Neutralization Testing					
	Explosives					
Military Expended Material	Ingestible Material: Neutralizer (explosive) fragments Non-Ingestible Material: Fiber optic cables, fiber optic cans, mine shapes (non-explosive)	Military Recoverable Material	Mine shapes (non-explosive)			
Sonar and Other Transducer Bins	None					
In-Water Explosive Bins	E4 E11					
Procedural Mitigation Measures	Physical Disturbance and Strike: (Section Vessel movement Towed in-water devices	Explosi	ive Stressors: (Section 5.3.3) ive mine countermeasure and utralization activities			
Assumptions Used for Analysis	None					

A.3.2.3.2 Mine Countermeasure Mission Package Testing

Mine Warfare				
Mine Counterm	neasure Mission Package Test	ing		
Short			Typical Dura	ation
Description	Vessels and associated aircr	aft conduct mine		rith intervals of mine
	countermeasure operations			sure mission package use during
			this time	ear e masser passage are arming
Long	Littoral Combat Ships condu	ct mine detection using	unmanned sub	omersible and aerial vehicles,
Description	_			ort helicopters, and laser systems.
·	Mines are then neutralized			
Typical	Platforms: Rotary-wing airc	raft, surface combatants,	unmanned a	erial systems, unmanned
Components	underwater vehicles, unmar	nned surface vehicles		
	Targets: Mine shapes			
	Systems being Trained/Tes	ted: Sonar systems		
Standard	Vessel safety	Typical Locations		
Operating	Aircraft safety	Range Complexes/Tes	ting Ranges:	Inland Waters/Pierside:
Procedures	Unmanned aerial, surface,	Gulf of Mexico		None
(Section 2.3.3)	and subsurface vehicle	Jacksonville		
	safety	Virginia Capes		
	Towed in-water device	Naval Surface Warfare		
	safety	Panama City Divisio		
		South Florida Ocean Measurement		
		Facility		
Stressors to	Acoustic:	Physical Disturbance a		Energy:
Biological	Sonar and other	Aircraft and aerial targets		In-air electromagnetic
Resources	transducers	Underwater explosives		devices
	Aircraft noise	Vessels and in-water d		Lasers
	Vessel noise	Military expended mat	terials	Futan alamant.
	Fundacionas	Seafloor devices		Entanglement:
	Explosives: Underwater explosives	Ingestions		Wires and cables
	Officer water explosives	Ingestion: Military expended mat	erials —	
		munitions	Citals	
Stressors to	Air Quality:		ts and water	Ouality:
Physical	Criteria air pollutants	Explosive		
Resources	Criteria dii poliatarits	EXPIOSIV	23 14100	
	Habitats:			
	Physical disturbance and stri	ke – military		
	expended material	,		
	Physical disturbance and stri	ke – seafloor		
	devices			
	Underwater explosives			
Stressors to	Cultural Resources:	Socioeconomic Re	esources:	Public Health and Safety:
Human		Accessibility		Physical interactions
Resources	Physical disturbance and stri	ke Airborne acoustic	5	In-air energy
	Explosives	Physical disturban	ce and strike	Underwater energy

Mine Warfare			
Mine Countern	neasure Mission Package Testing		
Military	Ingestible Material:	Military	Mine shapes (non-explosive)
Expended	Neutralizer (explosive) fragments	Recoverable	
Material		Material	
	Non-Ingestible Material:		
	Fiber optic cables, mine shapes (non-		
	explosive)		
Sonar and		ic Aperture Sonai	rs:
Other	HF4 SAS2		
Transducer			
Bins			
In-Water	E4		
Explosive			
Bins			
Procedural	Acoustic Stressors: (Section 5.3.2)	Explosi	ve Stressors: (Section 5.3.3)
Mitigation	Active sonar	Explosi	ve mine countermeasure and
Measures		neu	tralization activities
	Physical Disturbance and Strike: (Section	5.3.4)	
	Vessel movement		
	Towed in-water devices		
Assumptions	8 charges per event		
Used for	The in-air low-energy laser stressor was u	sed in analysis of	potential impacts on human resources.
Analysis			

A.3.2.3.3 Mine Detection and Classification Testing

Mine Warfare					
Mine Detection	and Classification Testing				
Short	Air, surface, and subsurface	vessels detect and	Typical Dura	ation	
Description	classify mines and mine-like	objects. Vessels also			
	assess their potential suscep	tibility to mines and	· ·	ys, with up to 12 hours of acoustic	
	mine-like objects.		activity each	i day	
Long	Mine detection and classification systems require testing to evaluate the capability of generating				
Description	underwater magnetic and acoustic signature fields as well as sonar systems that can detect, and				
				epths. Surface craft may deploy	
	• · · · · · · · · · · · · · · · · · · ·	·	•	susceptibility profile against	
	mine-like objects. In order to	· · · · · · · · · · · · · · · · · · ·			
				mines including a laser airborne	
				ensitive electro-optic receivers to	
				ipment has traditionally been	
	operate from unmanned aer		owever, the N	avy is developing the capability to	
Typical	Platforms: Moored platform		aa hasing shin	s small hoats submarines	
Components	support craft, surface comba				
	unmanned underwater vehi	•		,	
	Targets: Mine shapes				
	Systems being Trained/Tested: Sonar systems, low-energy lasers				
Standard	Vessel safety	Typical Locations			
Operating	Aircraft safety	Range Complexes/Tes	ting Ranges:	Inland Waters/Pierside:	
Procedures		Gulf of Mexico		None	
(Section 2.3.3)	Unmanned aerial, surface,	Jacksonville			
	and subsurface vehicle	Navy Cherry Point			
	safety	Virginia Capes Naval Surface Warfare Center,			
		Panama City Divisio			
		South Florida Ocean M	leasurement		
		Facility Offshore of Riviera Bea	ach Florida		
Stressors to	Acoustic:	Physical Disturbance a		Energy:	
Biological	Sonar and other	Aircraft and aerial targ		In-air electromagnetic	
Resources	transducers	Vessels and in-water d		devices	
	Aircraft noise	Seafloor devices		In-water electromagnetic	
	Vessel noise			devices	
		Ingestion:		Lasers	
	Explosives:	None			
	None			Entanglement:	
				None	
Stressors to	Air Quality: Sediments and Water Quality:				
Physical	Criteria air pollutants Metals				
Resources					
	Habitats:				
	Physical disturbance and stri devices	ке – seaтioor			
Chungan to		Cooleananair D		Dublic Hoolth and Cafety	
Stressors to Human	Cultural resources: Physical disturbance and stri	Socioeconomic Re ke Accessibility	esources:	Public Health and Safety: Physical interactions	
Resources	Friysical disturbance and Stri	Airborne acoustics		In-air energy	
Nesources		Air burrie acoustics	•	m-an energy	

Mine Warfare			
	n and Classification Testing		
		turbance and	strike Underwater energy
Military Expended	I -	litary coverable	Mine shapes (non-explosive)
Material		aterial	
	Non-Ingestible Material: Mine shapes (non-explosive)		
Sonar and	Mid-Frequency: High-Freque	ncy:	•
Other	MF1 MF5 HF1 HF8		
Transducer	MF1K HF4		
Bins			
In-Water	None		
Explosive			
Bins		<u> </u>	
Procedural	Acoustic Stressors: (Section 5.3.2)	-	l Disturbance and Strike: (Section 5.3.4)
Mitigation	Active sonar	Vessel ı	novement
Measures			
Assumptions	Some mine shapes could be deployed for a spe		
Used for	some mine shapes are left in place so that	multiple ever	nts can use the same shapes without
Analysis	needing to redeploy.		
	The in-air low-energy laser stressor was used i	n analysis of	potential impacts on human resources.

A.3.2.4 Surface Warfare

A.3.2.4.1 Gun Testing – Large-Caliber

Surface Warfard	e				
Gun Testing – L	arge-Caliber				
Short	Surface crews test large-cali	ber guns to defe	nd T	ypical Dura	tion
Description	against surface targets with	-		-2 weeks	
Long				ng, tracking	, and prosecuting small-boat
Description			-		package for the Littoral Combat
	Ship, which provides a layer	ed strike-defensi	ive capabilit	y by use of	its embarked support aircraft,
	medium range surface-to-su	ırface missiles, aı	nd 57 millin	neter gun w	reapon system.
Typical	Platforms: Surface combata	nts			
Components	Targets: Surface targets				
	Systems being Trained/Test	ted: None			
Standard	Vessel safety	Typical Locatio	ns		
Operating	Weapons firing safety	Range Comple	xes/Testing	Ranges:	Inland Waters/Pierside:
Procedures	Towed in-water device	Gulf of Mexico)		None
(Section 2.3.3)	safety	Jacksonville			
		Key West			
		Navy Cherry Po	oint		
		Northeast			
		Virginia Capes			
		Naval Surface		nter,	
		Panama Cit	•		
Stressors to	Acoustic:	Physical Distur		Strike:	Energy:
Biological	Vessel noise	Underwater ex	•		In-air electromagnetic
Resources	Weapons noise	In-air explosive			devices
	Front action of	Vessels and in-water devices			Fotos elements
	Explosives:	Military expen	ided materi	ais	Entanglement:
	Underwater explosives In-air explosives	Ingestion:			None
	in-air explosives	Yes			
Stressors to	Air Quality:		Sediments a	and Water (Quality:
Physical	Criteria air pollutants		Explosives		etals
Resources	Circuit di pondidito	_		•••	
	Habitats:				
	Physical disturbance and stri	ke – military			
	expended material				
	Underwater explosives				
Stressors to	Cultural Resources:	Socioecono	mic Resour	ces:	Public Health and Safety:
Human	Explosives	Accessibility			Physical interactions
Resources	Physical disturbance and	Airborne acc	oustics		In-air energy
	strike	Physical dist	turbance an	d strike	Underwater energy
Military	Ingestible Material:		/lilitary		e controlled surface targets,
Expended	Large-caliber projectile (expl	,	ecoverable	tow	ed surface targets
Material	fragments, target fragmer	nts N	/laterial		
	Non-Ingestible Material:	large			
	Expendable surface targets,	_			
	caliber (non-explosive) pro large-caliber casings	ojectiles,			
	iaige-calinel casiligs				

Surface Warfar	e	
Gun Testing – L	arge-Caliber	
Sonar and	None	
Other		
Transducer		
Bins		
In-Water	E3 E5	
Explosive		
Bins		
Procedural	Acoustic Stressors: (Section 5.3.2)	Explosive Stressors: (Section 5.3.3)
Mitigation	Weapons firing	Explosive medium- and large-caliber munitions
Measures		
	Physical Disturbance and Strike: (Section 5.3.4)	
	Vessel movement	
	Small-, medium-, and large-caliber non-explosive	
	practice munitions	
Assumptions	None	
Used for		
Analysis		

A.3.2.4.2 Gun Testing – Medium-Caliber

Surface Warfard	e				
Gun Testing – N					
Short			Typical Dura	ation	
Description	Surface crews defend agains	st surface targets with	1-2 weeks, with intervals of surface warfare		
	medium-caliber guns.			kage use during this time	
Long	Surface combatants conduct	t surface warfare by dete		g, and prosecuting small-boat	
Description	threats. Gun testing may als	o include the surface wa	rfare mission	package on the Littoral Combat	
	Ship, which provides a layer	ed strike-defensive capa	bility by use of	fits embarked support aircraft,	
	medium range surface-to-su	ırface missiles, and 30 m	m gun weapor	n system.	
Typical	Platforms: Surface combata	nts, rotary-wing aircraft,	support craft		
Components	Targets: Surface targets				
	Systems being Trained/Test	ted: None			
Standard	Vessel safety	Typical Locations			
Operating	Weapons firing safety	Range Complexes/Tes	ting Ranges:	Inland Waters/Pierside:	
Procedures	Towed in-water device	Gulf of Mexico		None	
(Section 2.3.3)	safety	Jacksonville			
		Key West			
		Navy Cherry Point			
		Northeast			
		Virginia Capes	6 .		
		Naval Surface Warfare Center,			
		Panama City Divisio			
Stressors to	Acoustic:	Physical Disturbance a	Energy:		
Biological Resources	Vessel noise	Underwater explosives	S	In-air electromagnetic	
Resources	Weapons noise	In-air explosives devices Vessels and in-water devices			
	Explosives:	Military expended ma		Entanglement:	
	Underwater explosives	willitary experided ma	teriais	None	
	Grider Water expressives	Ingestion:		. Tone	
		Military expended ma	terials –		
		munitions			
		Military expended ma	terials – other		
		than munitions			
Stressors to	Air Quality:	Sedimer	ts and Water	Quality:	
Physical	Criteria air pollutants	Explosive	es M	1etals	
Resources					
	Habitats:				
	Physical disturbance and stri	ke – military			
	expended material				
_	Underwater explosives				
Stressors to	Cultural Resources:	Socioeconomic Res	ources:	Public Health and Safety:	
Human	Dhuainal diatuud	Accessibility		Physical interactions	
Resources	Physical disturbance and	Airborne acoustics	and stalls	In-air energy	
	strike	Physical disturbance	e and strike	Underwater energy	
	Explosives				

Surface Warfar	e		
Gun Testing – N	Лedium-Caliber		
Military Expended Material	Ingestible Material: Medium-caliber projectile (explosive) fragments, target fragments, medium-caliber (non-explosive) projectiles, medium-caliber projectile casings Non-Ingestible Material: Expendable surface targets	Military Recoverable Material	Remote controlled surface targets, towed surface targets
Sonar and Other Transducer Bins	None		
In-Water Explosive Bins	E1		
Procedural Mitigation Measures	Physical Disturbance and Strike: (Section Vessel movement Small-, medium-, and large-caliber non-ex practice munitions	Explosi plosive pro	ive Stressors: (Section 5.3.3) ive medium-caliber and large-caliber jectiles
Assumptions Used for Analysis	50 or 1,400 rounds are expended per ever Events with 1,400 rounds have 700 explos		explosive rounds per event.

A.3.2.4.3 Gun Testing – Small-Caliber

Surface Warfard					
Gun Testing – S					
Short	Surface crews defend agains	t surface targets wi	th Typ i	cal Duration	
Description	small-caliber guns	· ·		y-2 weeks	
Long Description	Small-caliber guns are fired from surface vessels. This testing also includes anti-terrorism/force protection. During this event, surface craft surface targets will make threat profile approaches to the ship. Ship will demonstrate small-caliber gun testing with non-explosive rounds against the threat target. Small-caliber gun testing includes other class ship sea trials and surface warfare mission package testing.				
Typical Components	Platforms: Sea basing ships, Targets: Surface targets Systems being Trained/Test		s, small boa	its, rotary-wing	g aircraft
Standard	Vessel safety	Typical Locations			
Operating Procedures (Section 2.3.3)	Weapons firing safety Towed in-water device safety	Range Complexes Gulf of Mexico Jacksonville Key West Navy Cherry Point Northeast Virginia Capes Naval Surface Wa	t rfare Cente	Non	nd Waters/Pierside: e
Stressors to Biological Resources	Acoustic: Vessel noise Weapons noise	Physical Disturba Vessels and in-wa Military expended	ter devices		nergy: n-air electromagnetic devices
	Explosives: None	Ingestion: Military expended munitions	d materials		ntanglement: Jone
Stressors to Physical Resources	Air Quality: Criteria air pollutants Habitats: Physical disturbance and striexpended material	Me		l Water Qualit	y :
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike	Socioeconomic Accessibility Airborne acous Physical disturb	tics	Phys In-ai	lic Health and Safety: sical interactions ir energy
Military Expended Material	Ingestible Material: Small-caliber projectiles (nor explosive), small-caliber procasings Non-Ingestible Material: Expendable surface targets	Milit	ary overable	Remote con	trolled surface targets, face targets

Surface Warfar	е
Gun Testing – S	mall-Caliber
Sonar and	None
Other	
Transducer	
Bins	
In-Water	None
Explosive	
Bins	
Procedural	Physical Disturbance and Strike: (Section 5.3.4)
Mitigation	Vessel movement
Measures	Small-, medium-, and large-caliber non-explosive
	practice munitions
Assumptions	500-1,000 rounds are expended per event.
Used for	Ships may not be conducting tests consistently for the duration of the event.
Analysis	

A.3.2.4.4 Kinetic Energy Weapon Testing

Surface Warfar	2	-				
	Weapon Testing					
			Tunical Duna	Aio		
Short Description	A kinetic energy weapon use		Typical Dura	ation		
·	released in a burst to accelerate a projectile. 1 day A kinetic energy weapon uses stored energy released in a burst to accelerate a projectile to more					
Long						
Description	than seven times the speed	-	p to 200 miles.			
Typical	Platforms: Surface combata					
Components	Targets: Air targets, surface targets Systems being Trained/Tested: Kinetic energy weapon					
Chandand			JOH			
Standard	Vessel safety	Typical Locations				
Operating Procedures	Weapons firing safety	Range Complexes/Tes	iting Ranges:	Inland Waters/Pierside:		
(Section 2.3.3)		Gulf of Mexico		None		
(3600001 2.3.3)		Jacksonville				
		Key West				
		Navy Cherry Point Northeast				
Character to	A	Virginia Capes	I Ct	F		
Stressors to	Acoustic: Vessel noise	Physical Disturbance		Energy:		
Biological Resources		Aircraft and aerial tar	gets	In-air electromagnetic devices		
Resources	Weapons noise	In-air explosives Vessels and in-water of	lovicos	devices		
	Explosives:	Military expended ma		Entanglement:		
	In-air explosives	wiiitary expended ma	teriais	None		
	ili-ali explosives	Ingestion:		None		
		Military expended materials – other than munitions				
Stressors to	Air Quality:					
Physical	Criteria air pollutants	Metals	its and water	Quanty.		
Resources	Criteria dii poliatarito	Wetais				
	Habitats:					
	Physical disturbance and stri	ke – military				
	expended material	,				
Stressors to	Cultural Resources:	Socioeconomic Res	ources:	Public Health and Safety:		
Human	Physical disturbance and	Accessibility		Physical interactions		
Resources	strike	Airborne acoustics		In-air energy		
		Physical disturbance	e and strike	<u>.</u>		
Military	Ingestible Material:	Military	None	•		
Expended	Target fragments	Recovera	able			
Material		Material				
	Non-Ingestible Material:					
	Expendable aerial drones, ex					
	kinetic energy rounds, sab	ots,				
	stationary surface targets					
Sonar and	None					
Other						
Transducer						
Bins						

Surface Warfar	e
Kinetic Energy	Weapon Testing
In-Water Explosive Bins	None
Procedural Mitigation Measures	Physical Disturbance and Strike: (Section 5.3.4) Vessel movement Small-, medium-, and large-caliber non-explosive practice munitions
Assumptions Used for Analysis	Assume one target is expended per event. Explosive rounds are designed to detonate above the surface target.

A.3.2.4.5 Missile and Rocket Testing

Surface Warfard	e					
Missile and Roc	ket Testing					
Short	Missile and rocket testing in	cludes various missiles	Typical Durati	on		
Description	or rockets fired from subma		,,,			
	combatants. Testing of the I		1 day-2 weeks			
	ship defense is performed.	0 /	,			
Long	Missile and rocket testing in	cludes various missiles o	rockets (standa	ard missiles. Water Piercing		
Description	_		•	ng may occur during surface		
•	combatant sea trials and sur					
	warfare and surface warfare	· · · · · · · · · · · · · · · · · · ·		·		
Typical	Platforms: Submarines, surf	ace combatants				
Components	Targets: Air targets, land tar					
	Systems being Trained/Test	_	ring systems			
Standard	Vessel safety	Typical Locations				
Operating	Weapons firing safety	Range Complexes/Tes	ing Ranges:	Inland Waters/Pierside:		
Procedures	Towed in-water device	Gulf of Mexico		None		
(Section 2.3.3)	safety	Jacksonville				
		Key West				
		Navy Cherry Point				
		Northeast				
		Virginia Capes				
Stressors to	Acoustic:	Physical Disturbance a	nd Strike:	Energy:		
Biological	Vessel noise	Aircraft and aerial targ		In-air electromagnetic		
Resources	Weapons noise	Underwater explosives	i	devices		
		In-air explosives				
	Explosives:	Vessels and in-water d		Entanglement:		
	Underwater explosives	Military expended mat	erials	None		
	In-air explosives					
		Ingestion:				
		Military expended mat	eriais –			
		munitions Military expended mat	orials other			
		than munitions	eriais – Other			
Stressors to	Air Quality:	.	ts and Water Q	uality:		
Physical	Criteria air pollutants	Explosive		=		
Resources	Circeila dii polidedites	Chemica				
	Habitats:	Chemica	-			
	Physical disturbance and stri	ke – military				
	expended material	,				
	Underwater explosives					
Stressors to	Cultural Resources:	Socioeconomic Reso	ources:	Public Health and Safety:		
Human		Accessibility		Physical interactions		
Resources	Physical disturbance and	Airborne acoustics		In-air energy		
	strike	Physical disturbance		Underwater energy		
	Explosives	•		<i>5.</i>		
	•					

Surface Warfar	e						
Missile and Roo	Missile and Rocket Testing						
Military Expended Material	Ingestible Material: Missile (explosive) fragments, rocket (explosive) fragments, target fragments	Military Recoverable Material	Recoverable air and surface targets, towed surface targets				
	Non-Ingestible Material: Expendable aerial drones, missiles and rockets (non-explosive)						
Sonar and Other Transducer Bins	None						
In-Water Explosive Bins	E6 E10						
Procedural Mitigation Measures	Physical Disturbance and Strike: (Section 5.3.4) Vessel movement Non-explosive missiles and rockets Explosive Stressors: (Section 5.3.3) Explosive missiles and rockets						
Assumptions Used for Analysis	Targets used during non-explosive tests will be recovered. Explosive missiles will detonate either in the air or at the water's surface. Ships will not be conducting test constantly for the duration of the allotted time.						
Aildiyələ	This activity includes both air warfare and warfare Protective Measures Assessm	surface warfare	events, but it captured under the Surface				

A.3.2.4 Unmanned Systems

A.3.2.4.6 Underwater Search, Deployment, and Recovery

Other Testing A	Activities						
	arch, Deployment, and Recov	ery					
Short	Various underwater, botton	n crawling, robotic,	Typical Duration				
Description	vehicles are utilized in unde	_					
	recovery, installation, and so	canning activities.	1 day				
Long	Subsurface activities include	a variety of underwater vehicles, robotic or autonomous systems, and					
Description	items placed on the seafloo	r. Diving activities and s	special operations training also occur. Other				
	subsurface activities involve	manned and unmanne	ed underwater vehicles. All subsurface vehicles				
	are retrieved after use, whil	nile most objects (e.g., non-explosive mines) remain for a period of t					
	to be used as testing fixture	S.					
Typical	Platforms: Moored platform	ns, remotely operated v	vehicles				
Components	Targets: Mine shapes						
	Systems being Trained/Tes	ted: None					
Standard	Vessel safety	Typical Locations					
Operating	Unmanned aerial, surface,	Range Complexes/Te	sting Ranges: Inland Waters/Pierside:				
Procedures	and subsurface vehicle	South Florida Ocean I	Measurement None				
(Section	safety	Facility					
2.3.3)							
Stressors to	Acoustic:	Physical Disturbance					
Biological	None	Vessels and in-water	devices None				
Resources		Seafloor devices					
	Explosives:	I	Entanglement:				
	None	Ingestion: None	None				
Stressors to	Air Quality:		nts and Water Quality:				
Physical	Criteria air pollutants	None					
Resources	· ·						
	Habitats:						
	Physical disturbance and str	ike –					
	seafloor devices						
Stressors to	Cultural Resources:	Socioeconomic F	Resources: Public Health and Safety:				
Human	Physical disturbance and str	ike Physical disturba	nce and strike Physical interactions				
Resources							
Military	Ingestible Material:	Military					
Expended	None	Recover					
Material	Non-Ingestible Material:	Materia	I				
	None						
Sonar and	None						
Other							
Transducer							
Bins							
In-Water	None						
Explosive							
Bins							
Procedural	Physical Disturbance and St	rike: (Section 5.3.4)	· · · · · · · · · · · · · · · · · · ·				
Mitigation	Vessel movement	•					
Measures							

Other Testing A	Other Testing Activities				
Underwater Search, Deployment, and Recovery					
Assumptions	Mines and other objects may be placed on the bottom where they may remain for a period of time.				
Used for	They will eventually be retrieved.				
Analysis	Any acoustic sources used during this activity would be de minimis and not quantitatively analyzed				
	and, therefore, are not included under systems.				

A.3.2.4.7 Unmanned Aerial System Testing

Unmanned Sys	tems						
_	face Aerial System Testing						
Short	Unmanned aerial systems a	re launched from a	Typical Dura	ation			
Description	platform (e.g., fixed platform submarine) to test the capa	m or submerged bility to extend the	- , , p				
	surveillance and communica unmanned underwater vehi unmanned surface vehicles,	icles, manned and	1-12 hours				
Long			ehicles canable	e of controlled sustained level			
Description	Unmanned aerial systems are reusable, uncrewed vehicles capable of controlled, sustained, level flight. Anticipated scenarios of unmanned aerial system testing include both unmanned aerial system launcher testing and using unmanned aerial systems to extend the surveillance and communications range of distributed sensors, unmanned underwater vehicles, manned and unmanned surface vehicles, and submarines. To test unmanned aerial system launcher systems, a subsurface capsule release may be conducted. During testing, a negatively buoyant capsule is deployed underwater and descends to a programmed depth. The capsule then drops a weight, inflates a flotation collar, rises to the surface, and launches an unmanned aerial system. Personnel use radio frequency communications to control and communicate with the unmanned aerial system during its flight. In the event of an extended communications test, an aerostat (helium filled balloon) may be tethered to either a stationary buoy or an unmanned surface vehicle to test the						
Typical	extended range of commun		t craft unman	uned aerial systems			
Components	Platforms: Submarines, shore-based facility, support craft, unmanned aerial systems Targets: Land targets, surface targets						
Components	Systems being Trained/Tested: None						
Standard	Vessel safety	Typical Locations					
Operating	Unmanned aerial, surface,	Range Complexes/Tes	ting Pangas:	Inland Waters/Pierside:			
Procedures	and subsurface vehicle	Northeast	tilig Kaliges.	None			
(Section	safety	Virginia Capes		None			
2.3.3)	ou.c.,	Naval Undersea Warfa Division, Newport	re Center				
Stressors to	Acoustic:	Physical Disturbance a	nd Strike:	Energy:			
Biological Resources	Vessel noise	Vessels and in-water d Aircraft and aerial targ		None			
	Explosives:	Military expended mat	_				
	None			None			
		Ingestion: Military expended mat	erials – other				
		than munitions					
Stressors to	Air Quality:	Sedimen	ts and Water	Quality:			
Physical Resources	Criteria air pollutants	Metals	Other n	naterials			
	Habitats: Physical disturbance and str expended material	ike – military					
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike	Socioeconomic Reso Accessibility Airborne acoustics	ources:	Public Health and Safety: Physical interactions			
resources	Suike	Physical disturbance	and strike				

Unmanned Sys	Unmanned Systems						
	Unmanned Surface Aerial System Testing						
Military Expended	Ingestible Material: Endcaps and pistons (non-chaff and	Military Recoverable	None				
Material	flare)	Material					
	Non-Ingestible Material: Ballast weights, canisters, sabots, expendable capsules						
Sonar and Other Transducer Bins	None						
In-Water Explosive Bins	None						
Procedural Mitigation Measures	Physical Disturbance and Strike: (Section Vessel movement	5.3.4)					
Assumptions Used for Analysis	None						

A.3.2.4.8 Unmanned Surface Vehicle System Testing

Unmanned Syst	tems						
	face Vehicle System Testing						
Short	Testing involves the product	ion or upgrad	le of	Турі	oical Duration		
Description	unmanned surface vehicles.	This may incl	ude				
	testing of mine detection ca	pabilities, eva	luating		to 10 days. Some propulsion systems ders) could operate continuously for		
	the basic functions of individ	-	s, or		Itiple months.		
	complex events with multip				·		
Long		esting includes assessment of single-vehicle and multi-vehicle technical					
Description			-		Most unmanned vehicle mission		
	T	transit, mission profile execution, and recovery operations. Unmanned lly remote-controlled, semi-autonomous, modular, multi-mission ace vehicles include rigid hull inflatable boats, cooperative autonomous					
	_						
			_		trolled jet skis. Unmanned surface vehicles		
	-	•			e launched, the vehicles may be towed or		
					s may deploy, tow, operate, or recover		
					ction sensors. Systems on the unmanned		
	surface vehicle may be acou	stically active	or produce	radio	o-frequency transmissions or provide lase		
	illumination for electro-opti	cal detection.					
Typical	Platforms: Unmanned surfa	ce vehicles, sı	ipport boat	S			
Components	Targets: None	_					
	Systems being Trained/Test			ehicle	es		
Standard	Vessel safety	Typical Loca					
Operating	Unmanned aerial, surface,	Range Com	=				
Procedures (Section 2.3.3)	and subsurface vehicle safety	Naval Unde		e Cer	nter None		
(3000001 2.3.3)	Salety	Division,	Newport				
Stressors to	Acoustic:	Physical Dis	sturbance a	nd Sti	trike: Energy:		
Biological	Vessel noise	Vessels and	in-water de	evices	s In-air electromagnetic		
Resources					devices		
	Explosives:	Ingestion:					
	None	None			Entanglement:		
	A. A. III		- II		None		
Stressors to	Air Quality:			ts and	d Water Quality:		
Physical Resources	Criteria air pollutants		None				
Resources	Habitats:						
	None						
Stressors to	Cultural Resources:	Socioeco	nomic Reso	urces	s: Public Health and Safety:		
Human	Physical disturbance and	Accessibi	lity		Physical interactions		
Resources	strike		, disturbance	and s			
Military	Ingestible Material:	-	Military		Surface targets		
Expended	None		Recoveral	ble			
Material			Material				
	Non-Ingestible Material: None						
Sonar and	None	-			·		
Other							
Transducer							
Bins							
In-Water	None	-		-			

Unmanned Sys	tems
Unmanned Sur	face Vehicle System Testing
Explosive Bins	
Procedural	Physical Disturbance and Strike: (Section 5.3.4)
Mitigation Measures	Vessel movement
Assumptions	None
Used for	
Analysis	

A.3.2.4.9 Unmanned Underwater Vehicle Testing

Unmanned Syst	Unmanned Systems						
	derwater Vehicle Testing						
Short	Testing involves the product	tion or upgrade of	Typical Dura	tion			
Description	unmanned underwater vehi testing of mine detection ca the basic functions of individ complex events with multip	pabilities, evaluating dual platforms, or	Up to 35 days. Some propulsion systems (gliders) could operate continuously for multiple months.				
Long Description	Unmanned underwater veh parameters, to full mission, vehicle operations include a Unmanned underwater veh anti-submarine warfare targ surface craft, submarines, p propelled to the test area. L recover remote sensors and be acoustically active, producelectro-optical detection. Ve unmanned platforms on whinclude unmanned underwater vehicles interacting in formation of unmanned underwater vehicles.	hicle testing ranges from single-vehicle tests to evaluate hydrodynamic n, multiple vehicle functionality assessments. Most unmanned underwater a launch, transit, mission profile execution, and recovery operations. hicles include modular, multi-mission platforms and their payloads, and regets. Unmanned underwater vehicles may be launched from aircraft, piers, or land. Once launched, the vehicles are either towed or self-Unmanned underwater vehicles may also deploy, tow, operate, or ad payload systems. Systems on or towed by the unmanned vehicle may duce radio-frequency transmissions or provide laser illumination for vehicle development involves the production and upgrade of new which to attach various payloads used for different purposes. Platforms can vater vehicles, unmanned surface vehicles, and unmanned aerial systems. Parious systems that can be incorporated onto unmanned platforms for oping, and other missions. This type of test can also include multiple mations or acting as individual units and includes tests and demonstrations vehicles in detecting and classifying mine-like or other buried objects.					
Typical		-	port craft, sur	face combatants, unmanned			
Components	underwater vehicles, moore	· ·					
	Targets: Mine warfare targe Systems being Trained/Tes underwater vehicles			unication systems, unmanned			
Standard	Vessel safety	Typical Locations					
Operating Procedures (Section 2.3.3)	Unmanned aerial, surface, and subsurface vehicle safety Towed in-water device safety	Range Complexes/Test Gulf of Mexico Jacksonville Naval Surface Warfare Panama City Division Naval Undersea Warfar Division, Newport South Florida Ocean M Facility Offshore of Riviera Bea	Inland Waters/Pierside: None				
Stressors to	Acoustic:	Physical Disturbance a		Energy:			
Biological	Sonar and other	Vessels and in-water de	evices	In-air electromagnetic			
Resources	transducers	Seafloor devices		devices			
	Vessel noise Explosives: Underwater explosives	Ingestion of Expended Military expended mat munitions Military expended mat than munitions	Material: erials –	Lasers Entanglement: Decelerators/parachutes			

Unmanned Sys	tems				
Unmanned Und	derwater Vehicle Testing				
Stressors to	Air Quality:		Sediments and	Water Quality:	
Physical	Criteria air pollutants		Explosives	Metals	
Resources			Chemical	Other materials	
	Habitats:				
	Physical disturbance and strike – mili	tary			
	expended material				
	Physical disturbance and strike seaflo	oor			
	devices				
	Underwater explosives				
Stressors to			nomic Resources	· · · · · · · · · · · · · · · · · · ·	
Human	I	essibil	•	Physical interactions	
Resources	-	sical d	isturbance and st	= -	
	Explosives			Underwater energy	
Military	Ingestible Material:		Military	Recoverable stationary artificial targets,	
Expended	Target fragments, lightweight torped	do	Recoverable	acoustic countermeasures, bottom-	
Material	(explosive) fragments, small		Material	placed instruments, mine shapes,	
	parachutes/decelerators			stationary surface targets	
	Non-Ingestible Material:	,			
	Anchors, mine shapes (non-explosive expendable motorized autonomou				
	targets, expendable stationary	15			
	artificial targets, lightweight torped	do			
	(non-explosive) accessories,	uo			
	sonobuoys (non-explosive)				
Sonar and		h-Fred	quency:		
Other	MF9 HF4		40.0		
Transducer					
Bins					
In-Water	E8				
Explosive					
Bins					
Procedural	Acoustic Stressors: (Section 5.3.2)		Physica	l Disturbance and Strike: (Section 5.3.4)	
Mitigation	Active sonar			novement	
Measures				in-water devices	
Assumptions				nd then retrieved afterwards. However,	
Used for	•	e so tl	hat multiple ever	nts can use the same shapes without	
Analysis	needing to redeploy.				
	Multiple vehicles may operate simultaneously in one or multiple areas.				

A.3.2.5 Vessel Evaluation

A.3.2.5.1 Aircraft Carrier Sea Trials - Propulsion Testing

Vessel Evaluati	on						
Aircraft Carrier	Sea Trials – Propulsion Testi	ng					
Short	Ship is run at high speeds ir	various formations	Typica	al Duration			
Description	(e.g., straight-line and recip		1-2 da	ays			
Long	Propulsion testing is one pa	ort of the total aircraft		a trial activity. Propulsion testing includes			
Description				ess of 30 knots) and endurance runs in			
	both straight line and reciprocal paths.						
Typical	Platforms: Aircraft carriers						
Components	Targets: None						
	Systems being Trained/Tes	sted: None					
Standard	Vessel safety	Typical Locations					
Operating		Range Complexes/	Testing Rai	nges: Inland Waters/Pierside:			
Procedures		Virginia Capes	J	None			
(Section							
2.3.3)							
Stressors to	Acoustic:	Physical Disturband		e: Energy:			
Biological	Vessel noise	Vessels and in-wate	r devices	In-air electromagnetic			
Resources				devices			
	Explosives:	Ingestion:					
	None	None		Entanglement:			
				None			
Stressors to	Air Quality:	Sedir	nents and \	Water Quality:			
Physical	Criteria air pollutants	None					
Resources							
	Habitats:						
	None		-	2.10.00.00			
Stressors to	Cultural Resources:	Socioeconomic I	Resources:	Public Health and Safety:			
Human	Physical disturbance and strike	Accessibility		Physical interactions			
Resources	Strike	Physical disturba	nce and su	rike In-air energy			
Military	Ingestible Material:	Milita	rv	None			
Expended	None		erable				
Material		Mate	ial				
	Non-Ingestible Material:						
	None						
Sonar and	None						
Other							
Transducer							
Bins							
In-Water	None						
Explosive							
Bins							
Procedural	Physical Disturbance and S	trike: (Section 5.3.4)					
Mitigation	Vessel movement						
Measures			_				
Assumptions	Ships may not be traveling i	_					
Used for	Ships will operate across the		-				
Analysis	Ships will not be conducting	test constantly for th	e duration	of the allotted time.			

A.3.2.5.2 Large Ship Shock Trial

Vessel Fusiosti	- -					
Vessel Evaluation						
Large Ship Shoo			·		15 1	
Short	Underwater detonations aga					
Description	carrier or surface combatan	τ.			-	weeks, with one detonation
				-		ver, smaller charges may be
						onsecutive days.
Long						for the Navy may undergo an
Description						ions that sends a shock wave
	through the ship's hull to sir				-	•
				arious	distances i	from the ship (charges are set
Tomical	closer to the ship as the tria				-: f t	to m in a minorally
Typical	Platforms: Aircraft carriers,	suppor	t craft, fixed	-wing	aircraft, ro	otary-wing aircraft
Components	Targets: None Systems being Trained/Test	tad: No	no			
Standard	Systems being Trained/Test Vessel safety		al Locations			
Operating	Aircraft safety			- /T	lina lu	aland Mataus /Diausida.
Procedures	All Clair Salety	Range	e Complexe	s/ res	_	nland Waters/Pierside: one
(Section 2.3.3)		_	of Mexico		IN	one
(0000.011 _1010)			onville			
			nia Capes			
Stressors to	Acoustic:	•		nce ai	nd Strike:	Energy:
Biological	Vessel noise				In-air electromagnetic	
Resources	Aircraft noise		ft and aerial			devices
			water explo	_		
	Explosives:		ry expended		erials	Entanglement:
	Underwater explosives		, ,			None
		Ingest	ion:			
		Milita	ry expended	l mate	erials –	
		oth	er than mu	nition	S	
Stressors to	Air Quality:		Sediment	s and	Water Qua	ality:
Physical	Criteria air pollutants		Explosive		Chem	icals
Resources			Other ma	terials	5	
	Habitats:					
	Physical disturbance and stri					
	military expended mater	ial				
6	Underwater explosives					
Stressors to	None					
Human Resources						
Military	Ingestible Material:	-	Military		None	
Expended	Ship shock charge fragments	c	Recoverab	nle	NOTIE	
Material	Simp shock charge magnificity	,	Material	,,,,		
7.000.701	Non-Ingestible Material:		,			
	None					
Sonar and	None	-			-	
Other	-					
Transducer						
Bins						

Vessel Evaluati	on	
Large Ship Shoo	ck Trial	
In-Water Explosive	E17	
Bins		
Procedural Mitigation Measures	Physical Disturbance and Strike: (Section 5.3.4) Vessel movement	Explosive Stressors: (Section 5.3.3) Ship shock trials
Assumptions Used for Analysis	Four charges are used per event. Only one event will occur per 5-year period Ship shock trials will occur in waters deeper Modeling scenario: Four 40,000-lb. charges Stressors to human resources were not ana 12 NM from shore.	than 650 ft.

A.3.2.5.3 Air Defense Testing

Vessel Evaluation	on					
Air Defense Tes	ting					
Short	Tests the ship's capability to	detect, identify, track,	Typical Dura	tion		
Description	and successfully engage live	and simulated targets.				
	Gun systems are tested usin	g non-explosive and	7 days			
	explosive rounds.					
Long				ck environments, using a mix of		
Description	= -		•	, and successfully engage live and		
	_	_		n the presence of debris, long		
		•		g, track load in the presence of		
	electronic attack and chaff, a	•				
	5000000000 inch 0.62-calib		ly include a 15	5 millimeter gun.		
Typical	Platforms: Surface combata	nts				
Components	Targets: Air targets Systems being Trained/Tested: Radar systems, gun systems					
Chandand		-	systems			
Standard	Vessel safety Aircraft safety	Typical Locations	–			
Operating Procedures	Weapons firing safety	Range Complexes/Tes	ting Ranges:	Inland Waters/Pierside:		
(Section 2.3.3)	weapons ming salety	Jacksonville		None		
	Assusting	Virginia Capes	and Chailes.			
Stressors to	Acoustic: Aircraft noise	Physical Disturbance a		Energy:		
Biological Resources	Vessel noise	Aircraft and aerial targ In-air explosives	eis	In-air electromagnetic devices		
Resources	Weapons noise	Vessels and in-water d	ovices	uevices		
	weapons noise	Military expended mat		Entanglement:		
	Explosives:	winter y experieda mat	.criais	None		
	In-air explosives	Ingestion:				
	·	Military expended mat	erials –			
		munitions				
		Military expended mat	erials – other			
		than munitions				
Stressors to	Air Quality:	Sedimen	ts and Water	Quality:		
Physical	Criteria air pollutants	Metals	Ot	ther materials		
Resources						
	Habitats:					
	Physical disturbance and stri	ike – military				
	expended material					
Stressors to	Cultural Resources:	Socioeconomic Reso	ources:	Public Health and Safety:		
Human	Physical disturbance and	Accessibility		Physical interactions		
Resources	strike	Airborne acoustics	and strike	In-air energy		
		Physical disturbance	anu strike			

Vessel Evaluati	on				
Air Defense Tes	sting				
Military Expended Material	Ingestible Material: Per chaff: one chaff-air cartridge, one plastic endcap, one compression pad or one plastic piston, chaff fibers; missile (explosive) fragments; large-caliber projectile (explosive) fragments,; target fragments; medium-caliber (non-explosive) projectiles Non-Ingestible Material: Large-caliber projectiles (non-explosive), missiles (non-explosive),	Military Recoverable Material	None		
Sonar and Other Transducer Bins	expendable aerial drones, canisters, large-caliber projectile casings None				
In-Water Explosive Bins	None				
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3.2) Weapons firing Explosive Stressors: (Section 5.3.3) Explosive medium-caliber and large-calibe projectiles	Vessel movement Small-, medium-, and large-caliber non-explosive			
Assumptions Used for Analysis	Ships will not be conducting test constant! This activity incorporates components of b	-			

A.3.2.5.4 Hydrodynamic and Maneuverability Testing

Other Testing A	ctivities					
	and Maneuverability Testing					
Short	Submarines maneuver in th	ne submerged	operating	Typical	Duration	
Description	environment.		оро. ас <u>6</u>	10 days		
Long		quired to valid	date the con	control and maneuverability of a submarine in		
Description	the submerged operating e	-	date the con	ti Oi aiiu i	maneuverability of a submarine in	
Typical	Platforms: Submarines	invironment.				
Components	Targets: None					
Components	_	Systems being Trained/Tested: Submersibles				
Standard						
	Vessel safety	Typical Loca		_		
Operating Procedures	,	Range Comp		ng Range		
		Gulf of Mex			None	
(Section 2.3.3)		Jacksonville				
		Key West	Б			
		Navy Cherry	/ Point			
		Northeast				
		Virginia Cap		•		
Stressors to	Acoustic:	Physical Dis			· ·	
Biological	Vessel noise	Vessels and	ın-water de	vices	None	
Resources						
	Explosives:	Ingestion:			Entanglement:	
	None	None			None	
Stressors to	Air Quality:			s and Wa	ter Quality:	
Physical	None		None			
Resources						
	Habitats:					
	None					
Stressors to	Cultural Resources:		nomic Resou	urces:	Public Health and Safety:	
Human	None	Accessibil	-		Physical interactions	
Resources		Physical d	listurbance a		-	
Military	Ingestible Material:		Military		one	
Expended	None		Recoverab	le		
Material			Material			
	Non-Ingestible Material:					
	None					
Sonar and	None					
Other						
Transducer						
Bins	-			<u>-</u>	.	
In-Water	None					
Explosive Bins						
Procedural	Physical Disturbance and S	Strike: (Section	1			
Mitigation	5.3.4)					
Measures	Vessel movement					
Assumptions	_	•			are only analyzed for the periods	
Used for		-	-		e. Mitigation measures related to	
Analysis	vessel movement are or	nly considered	d during the	period of	t surtacing as well.	
	For human resource stresso	or analysis. ph	vsical distur	bance an	d strike and physical interactions are	
					faced, typically brief in nature.	
	om, analyzed for the pr		.c sasinailii	- u. c Jui	.acca, cypicany orien in nature.	

A.3.2.5.5 In-Port Maintenance Testing

Vessel Evaluation	on						
In-Port Mainter	nance Testing						
Short	Each combat system is teste	d to en	sure they	Турі	cal Durat	tion	
Description	are functioning in a technica	ally acce	eptable				
	manner and are operational				3 weeks		
	support at-sea Combat Syste	•			2 weeks		
	Qualification Trial events.						
Long	Each combat system is teste		-		_		
Description	•	-				t System Ship Qualification Tria	
	•	-				epair/Requirements Cards, and	
	each system and pieces of e		-			olishing testing standards for	
	experts, complete all actions		=		-		
	Observation Reports are wri				_	nere required. Trouble	
Typical	Platforms: Amphibious warf						
Components	Targets: None		93, 3411466	0011100	icarres		
	Systems being Trained/Test	ted: Rad	dar, low-en	ergy la	isers		
Standard	Vessel safety		al Locations				
Operating	,		e Complexe		ting	Inland Waters/Pierside:	
Procedures		Range	-		. 0	Mayport, Florida	
(Section 2.3.3)		None				Norfolk, Virginia	
Stressors to	Acoustic:	Physic	al Disturba	ance a	nd Strike	: Energy:	
Biological	None	None		In-air electromagnetic			
Resources						devices	
	Explosives:	Ingest	ion:		Lasers		
	None	None				_	
						Entanglement:	
Character	Alia Occalitaci	-	C11		114/	None	
Stressors to	Air Quality:		Sedimen	its and	water C	quality:	
Physical Resources	None		None				
Resources	Habitats:						
	None						
Stressors to	Cultural Resources:	Soc	cioeconom	ic Reso	ources:	Public Health and Safety:	
Human	None	No				In-air energy	
Resources						Underwater energy	
Military	Ingestible Material:		Military		None		
Expended	None		Recovera	ble			
Material			Material				
	Non-Ingestible Material:						
	None	<u>-</u>			<u> </u>		
Sonar and	None						
Other							
Transducer Bins							
	None	_		-	-	-	
In-Water Explosive	None						
Bins							
כוווט							

Vessel Evaluation	Vessel Evaluation			
In-Port Mainter	nance Testing			
Procedural	None			
Mitigation				
Measures				
Assumptions	None			
Used for				
Analysis				

A.3.2.5.6 Propulsion Testing

Vessel Evaluation	n				
Propulsion Test					
Short	Ship is run at high speeds in v	various formativ	ons Tyni	cal Dura	tion
Description	(straight-line and reciprocal p		1 da		tion
Long				•	his event the chin is tested for
Description	Propulsion testing is one part of the total sea trial activity. During this event, the ship is tested for maneuverability, including full power and endurance runs.				
Typical		•			ng ships, surface combatants,
Components	small boats, specialized high	• •	support snips,	sca Dasii	ing simps, surface combatants,
Components	Targets: None	speca verneres			
	Systems being Trained/Teste	ed: None			
Standard	_	Typical Locatio	ns		
Operating		Range Comple		anges:	Inland Waters/Pierside:
Procedures		Gulf of Mexico	_		None
(Section		Jacksonville			
2.3.3)		Key West			
		Navy Cherry P	oint		
		Northeast			
		Virginia Capes			
Stressors to	Acoustic:	Physical Distu	rbance and St	rike:	Energy:
Biological	Vessel noise	Vessels and in-water devices			In-air electromagnetic
Resources		devices			
	Explosives:	Ingestion:			
	None	None			Entanglement:
					None
Stressors to	Air Quality:	9	Sediments and	l Water (Quality:
Physical	Criteria air pollutants	1	None		
Resources					
	Habitats:				
	None				- III
Stressors to	Cultural Resources:		nomic Resourc	es:	Public Health and Safety:
Human	Physical disturbance and strik		•	مائستما	Physical interactions
Resources	Lancathla Beataile		isturbance and		In-air energy
Military	Ingestible Material:		lilitary ecoverable	None	
Expended Material	None		ecoverable Naterial		
Waterial	Non-Ingestible Material:	"	lateriai		
	None				
Sonar and	None	-		<u> </u>	
Other					
Transducer					
Bins					
In-Water	None	-	-		-
Explosive					
Bins					
DIIIS					
Procedural	Physical Disturbance and Stri	ike: (Section 5.3	3.4)		<u>-</u>
	Physical Disturbance and Stri Vessel movement	ike: (Section 5.3	3.4)		

Vessel Evaluati	Vessel Evaluation					
Propulsion Test	Propulsion Testing					
Assumptions	Ships will not be conducting test constantly for the duration of the allotted time.					
Used for	Ships may not be traveling in a straight line.					
Analysis	Ships will operate across the full spectrum of capable speeds.					
	During surface combatant sea trials full-power runs are conducted for a total of 4 hours, and					
	endurance runs are conducted for a total of 2 hours.					
	Testing may occur near Pascagoula, Mississippi when in the Gulf of Mexico.					

A.3.2.5.7 Signature Analysis Operations

Other Testing A	Activities					
	ysis Operations					
Short	Surface ship and submarine	testing of		Typic	cal Durat	tion
Description	electromagnetic, acoustic, c	_	dar	dar		
	signature measurements.			Periodically over multiple days		
Long	Signature analysis activities	include electr	romagnetic	, acous	stic, opti	cal, and radar signature
Description	_	•	•		-	urface and subsurface vessels.
	These activities include elec					
	submarines, acoustic and m	-				
	surface ships, radar, and op		n of surface	ships.	Testing	includes intelligence,
Tunical	surveillance, reconnaissance		s support	oroft o	hara ha	and famility
Typical Components	Platforms: Moored platforn Targets: None	ns, submarine	es, support	craft, s	nore bas	sed facility
Components	Systems being Trained/Tes	ted: Electrom	agnetic dev	vices a	coustic	modems, ontical and radar
	systems, sonar systems	tea. Electroni	iagnetic de	vices, c	icoustic	moderns, optical and radai
Standard	Vessel safety	Typical Loca	itions			
Operating	1 0000. 00. 00,	Range Com		ting Ra	nges:	Inland Waters/Pierside:
Procedures		South Florid				None
(Section		Facility				
2.3.3)						
Stressors to	Acoustic:	Physical Disturbance and Strike: Energy:			= -	
Biological	Sonar and other	Vessels and	l in-water d	evices		In-air electromagnetic
Resources	transducers					devices
	Vessel noise	Ingestion:	andad mat	- oriolo	o+b o r	Futous doment.
	Explosives:	Military exp		lei iais	– otner	Entanglement: Small
	None	than ma	IIICIOTIS			decelerators/parachutes
						Cables and wires
Stressors to	Air Quality:		Sedimen	ts and	Water 0	
Physical	Criteria air pollutants		Metals		Chemi	cals
Resources			Other ma	aterials	S	
	Habitats:					
	Physical disturbance and str	ike – military				
	expended material		<u> </u>			
Stressors to	Cultural Resources:		conomic Re	esourc	es:	Public Health and Safety:
Human Resources	Physical disturbance and str		ıbılity al disturban	ده عمط	l ctribo	Physical interactions In-air energy
Resources		PHYSICa	ii uisturbari	ce and	strike	Underwater energy
Military	Ingestible Material:		Military		Anchor	rs,
Expended	Small decelerators/parachu	tes	Recovera	ble		
Material	Non-Ingestible Material:		Material			
	Anchors, expendable					
	bathythermographs, expe	ndable				
	bathythermograph wires,					
	(non-explosive)					

Other Testing A	ctivities				
Signature Analy	ysis Opera	tions			
Sonar and	Mid-Free	quency:	High-Frequ	iency:	Acoustic Modems:
Other	MF9	MF10	HF1		M3
Transducer					
Bins	Low-Fre	quency:	Anti-Subm	arine Warfare:	
	LF4	LF6	ASW2		
	LF5				
In-Water	None	-	-	-	-
Explosive					
Bins					
Procedural	Acoustic	Stressors: (Section	on 5.3.2)	Physical Di	sturbance and Strike: (Section 5.3.4)
Mitigation	Active so	onar		Vessel mov	vement
Measures					
Assumptions	None		_	_	
Used for					
Analysis					

A.3.2.5.8 Surface Warfare Testing

Vessel Evaluation	on					
Surface Warfard						
Short		shoard concors to	Typical Desi	ation		
	Tests the capabilities of ship detect, track, and engage su		Typical Dura	ativil		
Description	may include ships defending	•				
	targets using explosive and gun system structural test fi	· · · · · · · · · · · · · · · · · · ·				
	demonstration of the respo	_	7 days			
	against land based targets (s					
	locations).	·				
Long	Surface warfare events are a					
Description	•	-		ensors to detect and track surface		
		_		ge targets with simulated and live		
	_		-	arfare gun capability to receive		
				nd aimpoint corrections (spots),		
			_	fering ranges, and deliver surface		
	direct fire on the surface or		ng can also inc	ciude structural test firing.		
Typical	Platforms: Support craft, su					
Components	Targets: Air targets, electronic warfare targets, surface targets					
	Systems being Trained/Tested: Gun systems, electronic warfare systems					
Standard	Vessel safety	Typical Locations	_			
Operating	Weapons firing safety	Range Complexes/Test	ting Ranges:	Inland Waters/Pierside:		
Procedures		Gulf of Mexico		None		
(Section 2.3.3)		Jacksonville				
		Key West				
		Northeast				
		Virginia Capes				
Stressors to	Acoustic:	Physical Disturbance a		Energy:		
Biological	Aircraft noise	Aircraft and aerial targ		In-air electromagnetic		
Resources	Vessel noise	Underwater explosives	i	devices		
	Weapons noise	In-air explosives		Futour element.		
	Funlaciuses	Vessels and in-water d		Entanglement: Wires and cables		
	Explosives: Underwater explosives	Military expended mat	eriais	wires and cables		
	In-air explosives	Ingestion:				
	in-an explosives	Military expended mat	orials —			
		munitions	Citais			
		Military expended mat	erials – other			
		than munitions	criais other			
Stressors to	Air Quality:		ts and Water	Quality:		
Physical	Criteria air pollutants	Metals		Other materials		
Resources	Sseria dii poliuturito	Wictals	O			
	Habitats:					
	Physical disturbance and str	ike – military				
	expended materials	,				
	Underwater explosives					
Stressors to	Cultural Resources:	Socioeconomic Reso	ources:	Public Health and Safety:		
Human	Physical disturbance and	Accessibility		Physical interactions		
Resources	strike	Airborne acoustics		In-air energy		
	Explosives	Physical disturbance	and strike	Underwater energy		
		•		<u> </u>		

Vessel Evaluation	on		
Surface Warfar	e Testing		
Military Expended Material	Ingestible Material: Large- and medium-caliber projectile (explosive) fragments, medium- caliber projectiles (non-explosive), missile (explosive) fragments, target fragments Non-Ingestible Material: Large-caliber projectiles (non- explosive), missiles (non-explosive)	Military Recoverable Material	Remote controlled surface targets, stationary surface targets, towed air targets
Sonar and Other Transducer Bins In-Water Explosive	None E1 E5 E8		
Procedural Mitigation Measures	Acoustic Stressors: (Section 5.3.2) Weapons firing Physical Disturbance and Strike: (Section Vessel movement Small-, medium-, and large-caliber non-ex practice munitions Non-explosive missiles and rockets	Explos pro 5.3.4) Explos	ive Stressors: (Section 5.3.3) ive medium-caliber and large-caliber ojectiles ive missiles and rockets
Assumptions Used for Analysis	Ships will not be conducting tests constant	tly for the durati	on of the allotted time.

A.3.2.5.9 Undersea Warfare Testing

Vessel Evaluation	on						
Undersea Warf							
Short	Ships demonstrate capabilit	ty of countermeasure	Typical Durati	ion			
Description	systems and underwater su engagement and communic	rveillance, weapons					
	tests ships ability to detect, undersea targets.	•	Up to 10 days				
Long	_	ay be comprised of tracki	ng and firing ev	vents or tests of hull-mounted			
Description				Tracking and firing events ensure			
	•	the operability of the undersea warfare suite and its interface with the rotary wing helicopter. Tests include demonstrating the ability of the ship to search, detect and track a target and conduct					
	attacks with exercise torped			_			
	underwater platforms to te	st the capability of mid- a	nd high-frequer	ncy acoustic sources. Subsurface			
	moving targets, rocket and	air-dropped weapons, sor	nobuoys, towed	l arrays and sub-surface			
	torpedo-like devices may be	e used. Approximately 1 w	veek of in-port t	training may precede the event.			
Typical	Platforms: Rotary-wing airc		craft, surface c	combatants			
Components	Targets: Sub-surface target	_					
	Systems being Trained/Tes		sures, sonar sy	stems, sonobuoys			
Standard	Vessel safety	Typical Locations					
Operating	Aircraft safety	Range Complexes/Test	ing Ranges:	Inland Waters/Pierside:			
Procedures		Gulf of Mexico		None			
(Section 2.3.3)		Jacksonville					
		Navy Cherry Point					
		Northeast					
		Virginia Capes South Florida Ocean M	oacuromont				
		Facility	easurement				
Stressors to	Acoustic:	Physical Disturbance a		Energy:			
Biological	Sonar and other	Aircraft and aerial targe		In-air electromagnetic			
Resources	transducers	Vessels and in-water de		devices			
	Aircraft noise	Military expended mat	erials	Enternal control			
	Vessel noise	Ingestions		Entanglement: Wires and cables			
	Explosives:	Ingestion: Military expended mat	orials — other	Decelerators/parachutes			
	None	than munitions	eriais – otriei	Decererators/ paracritices			
Stressors to	Air Quality:		ts and Water Q	uality:			
Physical	Criteria air pollutants	Metals		emicals			
Resources	Criteria dii pondidires	Other ma					
	Habitats:						
	Physical disturbance and str	ike – military					
	expended material	•					
Stressors to	Cultural Resources:	Socioeconomic Reso	urces:	Public Health and Safety:			
Human	Physical disturbance and	Accessibility		Physical interactions			
Resources	strike	Airborne acoustics		In-air energy			
		Physical disturbance	and strike				

Vessel Evaluation	on			
Undersea Warf	are Testing			
Military	Ingestible Material:	Military	Heavyweight torpedoes (non-	
Expended	Small decelerators/parachutes,	Recoverable	explosive), lightweight torpedoes	
Material	parachutes-medium	Material	(explosive), miscellaneous surface	
			targets, recoverable motorized	
	Non-Ingestible Material:		autonomous targets	
	Acoustic countermeasures,			
	heavyweight torpedo accessories,			
	guidance wires, lightweight torpedo			
	accessories, sonobuoys (non-			
	explosive), sonobuoy wires,			
	expendable motorized autonomous			
	targets			
Sonar and	Mid-Frequency: High-Fr	equency:	Torpedoes:	
Other	MF1 MF5 HF4	HF8	TORP1 TORP2	
Transducer	MF1K MF9			
Bins		bmarine Warfare:		
	ASW3	ASW4		
In-Water	None			
Explosive				
Bins				
Procedural	Acoustic Stressors: (Section 5.3.2)	Physica	al Disturbance and Strike: (Section 5.3.4)	
Mitigation	Active sonar	Vessel	movement	
Measures				
Assumptions	Five targets are utilized per event.			
Used for	All sonobuoys have a parachute unless of			
Analysis	Ships will not be conducting test constan	tly during the dura	ation of the allotted time.	

A.3.2.5.10 Small Ship Shock Trial

Vessel Evaluation	nn .						
Small Ship Shoo							
Short	Underwater detonations are	used t	n test	Tyni	cal Durati	ion	
Description	new ships or major upgrades					4 weeks, with one detonation	
·	, , ,				-	wever, smaller charges may be	
				deto	nated on	consecutive days.	
Long		grade) of surface ships constructed for the Navy may undergo an					
Description		rial is a series of underwater detonations that sends a shock wave					
	through the ship's hull to sin				_	•	
		er event will be conducted at various distances from the ship he ship as the trial progressives).					
Typical	Platforms: Support craft, sur					raft rotary-wing aircraft	
Components	Targets: None	ruce ee	Jiiibataiits, i	ixea	wing and	are, rotary wing anciare	
·	Systems being Trained/Test	ed: No	ne				
Standard	Vessel safety	Typica	al Locations				
Operating	Aircraft safety	_	e Complexes	s/Tes	ting	Inland Waters/Pierside:	
Procedures		Range				None	
(Section 2.3.3)			onville				
Stressors to	Acoustic:		nia Capes cal Disturbar		ad Caulton	- Francis	
Biological	Vessel noise	-	ls and in-wat			Energy: In-air electromagnetic	
Resources	Aircraft noise		ft and aerial			devices	
			water explo	_			
	Explosives:	Milita	ry expended	l mate	erials	Entanglement:	
	Underwater explosives					None	
		Ingest		lmata	riala		
			ry expended ner than mur				
Stressors to	Air Quality:		Sediment			uality:	
Physical	Criteria air pollutants		Explosives			emicals	
Resources	·		Other ma	terials	S		
	Habitats:	_					
	Physical disturbance and stri						
Stressors to	military expended materi Cultural Resources:	dI -	-		-		
Human	None						
Resources							
Military	Ingestible Material:	-	Military		None		
Expended	Ship shock charge fragments	;	Recoverab	ole			
Material			Material				
	Non-Ingestible Material: None						
Sonar and	None						
Other							
Transducer							
Bins		_			_		
In-Water	E16						
Explosive							
Bins							

Vessel Evaluation	Vessel Evaluation						
Small Ship Shoo	Small Ship Shock Trial						
Procedural	Physical Disturbance and Strike: (Section	Explosive Stressors: (Section 5.3.3)					
Mitigation	5.3.4)	Ship shock trials					
Measures	Vessel Movement						
Assumptions	Four charges are utilized per event						
Used for	Three events will occur during the 5-year pe	riod.					
Analysis	Will occur in waters deeper than 650 ft.						
	Modeling scenario: Four 10,000-lb. charges						
	Stressors to human resources were not anal	yzed for this activity since it occurs greater than					
	12 NM from shore.						

A.3.2.5.11 Submarine Sea Trials – Propulsion Testing

Vessel Evaluat	ion					
Submarine Sea	Trials – Propulsion Testing					
Short	Submarine is run at high sp	eeds in vario	us Typ	cal Duration		
Description	formations, and at various			Up to 5 days		
Long	Propulsion testing is one p			•	ring this activity	
Description	submarines undergo a con			-	= -	
Description	operations, high speed tur	-	-		ridenig, idii powei	
Typical	Platforms: Submarines	iis, and extrei	ne deptil chang	23.		
Components	Targets: None	atad. Nasa				
	Systems being Trained/Te					
Standard	Vessel safety	Typical Loca		<u>.</u>		
Operating					Waters/Pierside:	
Procedures		Ranges:		None		
(Section		Jacksonville	<u> </u>			
2.3.3)		Northeast				
		Virginia Car	oes			
Stressors to	Acoustic:	Physical Dis	sturbance and S	trike: Ene	rgy:	
Biological	Vessel noise	Vessels and	l in-water device	es Non	e	
Resources						
	Explosives:	Ingestion:		Enta	anglement:	
	None	None		Non	=	
Stressors to	Air Quality:	-	Sediments an	d Water Quality		
Physical	None		None	a water quality.	•	
Resources	None		None			
Resources	Habitats:					
	None					
Stressors to	Cultural Resources:	Socioe	conomic Resou	cos: Public	Health and Safety:	
Human	None	Accessi			al interactions	
Resources	None		ollity Il disturbance ar	-	in interactions	
Resources		stri		ıu		
Military	Ingestible Material:	301	Military	None		
Military Expended	None		Recoverable	None		
Material	None		Material			
Material	Non Ingestible Metaviel		Material			
	Non-Ingestible Material: None					
Sonar and	None					
Other						
Transducer						
Bins		<u> </u>		<u>-</u>	-	
In-Water	None					
Explosive						
Bins						
Procedural	Physical Disturbance and S	Strike: (Sectio	n			
Mitigation	5.3.4)					
Measures	Vessel movement					
Assumptions	Subs will not be conducting	test constan	tly for the durat	ion of the allotte	nd time	
Used for	Subs may not be traveling i		•	ion of the anotte	a tille.	
Analysis	Subs will operate across the	_		eds		
Allalysis	Jans will operate across the	c run spectiul	ii oi cahanie shi	.cus.		

Vessel Evaluation

Submarine Sea Trials – Propulsion Testing

- For biological resource analysis, vessel noise and vessel strike are only analyzed for the periods while the submarines are surfaced, typically brief in nature. Mitigation measures related to vessel movement are only considered during the period of surfacing as well.
- For human resource stressor analysis, physical disturbance and strike and physical interactions are only analyzed for the periods while the submarine are surfaced, typically brief in nature.

A.3.2.6 Submarine Sea Trials – Weapons System Testing

Vessel Evaluation						
Submarine Sea	Trials – Weapons System Tes	ting				
Short	Submarine weapons and sor	nar systems ar	e tested	Typi	ical Duration	
Description	at-sea to meet the integrated combat system			lln t	to 7 days	
	certification requirements.			op ti	.o / days	
Long		-			o meet the integrated combat syste	
Description					e integrated combat system through	
		sts of passive a	and active	sonar	activities, launching "water slugs" a	nd
	exercise torpedoes.			<u> </u>		
Typical	Platforms: Moored platform	-	s, support o	raft		
Components	Targets: Sub-surface targets Sustains being Trained (Tasked) Assusting moderns, sonar systems, underwater communication					
	Systems being Trained/Tested: Acoustic modems, sonar systems, underwater communication systems					
Standard	Vessel safety	Typical Locat	tions			
Operating	Weapons firing safety	Range Comp		ting Ra	anges: Inland Waters/Pierside:	
Procedures		Gulf of Mexi			None	
(Section 2.3.3)		Jacksonville				
		Northeast				
		Virginia Cap	es			
		South Florid	a Ocean M	leasure	ement	
		Facility				
_	_	Offshore of Fort Pierce, Florida				
Stressors to	Acoustic:	Physical Dist			- -	
Biological Resources	Sonar and other transducers	Vessels and	ın-water d	evices	In-air electromagnetic devices	
Resources	Vessel noise	Ingestion:			devices	
	vessel floise	None			Entanglement:	
	Explosives:				Wires and cables	
	None					
Stressors to	Air Quality:	-	Sedimen	ts and	Water Quality:	
Physical	Criteria air pollutants		Explosive	es	Chemicals	
Resources			Metals		Other materials	
	Habitats:					
	Physical disturbance and stri	ike – military				
Chungana ha	expended material	Casianan			Dublic Hoolth and Cofee.	
Stressors to Human	Cultural Resources: Physical disturbance and	Accessibil	nomic Reso	Jurces	Public Health and Safety: Physical interactions	
Resources	strike		isturbance	and st	•	
	ouc	, o . o			Underwater energy	
Military	Ingestible Material:		Military		Expendable training targets,	
Expended	None		Recovera	ble	heavyweight torpedoes (non-	
Material			Material		explosive)	
	Non-Ingestible Material:					
C	Heavyweight torpedo access				T	
Sonar and	Mid-Frequency:	High-Fred	quency:		Toppa	
Other Transducer	MF3 MF10 MF9	HF1			TORP2	
Bins	IVII J				Acoustic Modems:	
2.113					M3	
					1115	

Vessel Evaluati	Vessel Evaluation					
Submarine Sea	Trials – Weapons System Testing					
In-Water	None					
Explosive						
Bins						
Procedural	Acoustic Stressors: (Section 5.3.2)	Physical Disturbance and Strike: (Section 5.3.4)				
Mitigation	Active sonar	Vessel movement				
Measures						
Assumptions	Submarines will not be conducting test co	nstantly for the duration of the allotted time.				
Used for						
Analysis						

A.3.2.6.1 Total Ship Survivability Trials

Vessel Evaluati	on							
Total Ship Surv								
Short	•	s" waanan hit	<u> </u>	Tymia	al Dura	tion		
	Series of simulated "realisti scenarios with resulting dar	-	F	туріс	cal Dura	uon		
Description		•		5 day	s, happ	ening once over a 5-year pe	eriod.	
1	recoverability exercises aga				-+I f	Alaa Maraa ahaa ahaa ahaa		
Long	Each new class (or major up	-	-			-	it-sea	
Description	Total Ship Survivability Trial scenario simulates a weapo	• •				•	hich	
	ship's force attempts to ma	-	_		-			
				-		_		
	_	rew casualties, and continues to fight. The TSST has been described as afely get to an actual hit." The goal of the TSST is to demonstrate that						
	the inherent ship design an			_				
	damage following a simulat	-					,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
	assessment. It does not eva	•	•					
Typical	Platforms: Aircraft carriers	nadic crew pre	onciency of	crann	116 1101 0	ioes it quality equipment		
Components	Targets: None							
Components	Systems being Trained/Tes	sted: None						
Standard	Vessel safety	Typical Loca	tions					
Operating	vesser surecy	Range Comp		ting Da	ngoc:	Inland Waters/Pierside:		
Procedures		Jacksonville	-	ung ive	aliges.	None		
(Section		Virginia Capes						
2.3.3)		Vilginia capes						
Stressors to	Acoustic:	Physical Dis	turbance a	nd Str	ike:	Energy:		
Biological	Vessel noise	Vessels and				In-air electromagnetic		
Resources						devices		
	Explosives:	Ingestion:						
	None	None				Entanglement:		
						None		
Stressors to	Air Quality:		Sediment	ts and	Water	Quality:		
Physical	Criteria air pollutants		None					
Resources								
	Habitats:							
	None	<u>.</u>				_		
Stressors to	Cultural Resources:	Socioeco	nomic Resc	ources	:	Public Health and Safety:		
Human	Physical disturbance and	Accessibil	•			Physical interactions		
Resources	strike	Physical d	listurbance	and s	trike	In-air energy		
Military	Ingestible Material:		Military		None			
Expended	None		Recoveral	ble				
Material	Non-Ingestible Material:		Material					
	None							
Sonar and	None	!				-		
Other								
Transducer								
Bins								
In-Water	None	-			-	-		
Explosive								
Bins								

Vessel Evaluati	Vessel Evaluation			
Total Ship Surv	Total Ship Survivability Trials			
Procedural	Physical Disturbance and Strike: (Section 5.3.4)			
Mitigation	Vessel movement			
Measures				
Assumptions	None			
Used for				
Analysis				

A.3.2.6.2 Vessel Signature Evaluation

Vessel Evaluation	on						
Vessel Signatur							
Short	Surface ship, submarine and	l auviliary system	Typical Duration				
Description	signature assessments. This electronic, radar, acoustic, i signatures.	may include	Typically 1-5 days, up to 20 days depending on the test being conducted				
Long	_	g of surface ships and sub	bmarines is accomplished on new ships and				
Description	periodically throughout a ship's life cycle to measure how detectable the ship is to radar. For example, Assessment Identification of Mine Susceptibility assessments are passive electromagnetic and acoustic measurements performed on mine countermeasure ships and on the Littoral Combat Ship mine countermeasure modules (i.e., auxiliary systems) to determine their mine susceptibility using seafloor deployed magnetometers and hydrophones, and a ship-board global positioning sensor tracking system. Signature testing of all surface ships and submarines verifies that each vessel's signature is within specifications, and may include the use of helicopter-deployed instrumentation, ship-mounted safety and navigation systems, fathometers, tracking devices, radar systems, and underwater communications equipment. Also included in this activity is the Shipboard Electronic Systems Evaluation Facility which conducts measurements of antenna radiation patterns, Federal Aviation Administration identification of Friend or Foe systems, and Tactical Air Navigation						
Typical	Systems. Platforms: Aircraft carriers	amphihious warfare shin	os combat logistics shins fixed wing aircraft				
Components	Platforms: Aircraft carriers, amphibious warfare ships, combat logistics ships, fixed wing aircraft, fleet support ships, mine warfare, patrol boats, rotary-wing aircraft, sea basing ships, small boats, special mission ships, specialized high speed vehicles, submarines, support craft, surface combatants Targets: None Systems being Trained/Tested: Radar systems, electromagnetic devices						
Standard	Vessel safety	Typical Locations	Š				
Operating Procedures (Section 2.3.3)	Aircraft safety	Range Complexes/Test Gulf of Mexico Jacksonville Virginia Capes	iting Ranges: Inland Waters/Pierside: Joint Expeditionary Base Little Creek, Virginia				
Stressors to Biological Resources	Acoustic: Sonar and other transducers Aircraft noise	Physical Disturbance a Aircraft and aerial targe Vessels and in-water de	gets In-water electromagnetic				
	Vessel noise Explosives: None	Ingestion: None	devices				
Stressors to Physical Resources	Air Quality: Criteria air pollutants Habitats: None	Sediments and Water Quality: None					
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike	Socioeconomic Reso Accessibility Physical disturbance	Physical interactions				

Vessel Evaluation						
Vessel Signatur	Vessel Signature Evaluation					
Military	Ingestible Material:	Military	None			
Expended	None	Recoverable				
Material		Material				
	Non-Ingestible Material:					
	None					
Sonar and	None					
Other						
Transducer						
Bins						
In-Water	None					
Explosive						
Bins						
Procedural	Physical Disturbance and Strike: (Section	5.3.4)				
Mitigation	Vessel movement					
Measures						
Assumptions	None	-				
Used for						
Analysis						

A.3.2.7 Other Testing

A.3.2.7.1 Chemical and Biological Simulant Testing

Other Testing	Activities					
Chemical and I	Biological Simulant Testing					
Short	Chemical-biological agent sim	ulants are der	oloved T	ypical Dura	tion	
Description	against surface ships.			B days		
Long		simulants are		d against surface ships to verify the integrity of the		
Description	ship's defense system includi					
	Methods of simulant delivery					
Typical	Platforms: Fixed-wing aircraf		•		Sp. 51.	
Components	Targets: None	,				
	Systems being Trained/Tested: None					
Standard	Vessel safety	Typical Loca	tions			
Operating	Aircraft safety		olexes/Testing	g Ranges:	Inland Waters/Pierside:	
Procedures	•	Jacksonville		P	None	
(Section		Navy Cherry			None	
2.3.3)		Northeast				
,		Virginia Capes				
Stressors to	Acoustic:	Physical Disturbance and Strike: Energy:				
Biological	Aircraft noise		aerial targets		In-air electromagnetic	
Resources	Vessel noise		in-water devi		devices	
	Explosives:	Ingestion:			Entanglement:	
	None	None			None	
Stressors to	Air Quality:		Sediments a	and Water (Quality:	
Physical	Criteria air pollutants		Chemicals		ther materials	
Resources	·					
	Habitats:					
	None					
Stressors to	Cultural Resources:	Socioe	conomic Res	ources:	Public Health and Safety:	
Human	Physical disturbance and strik	e Access	sibility		Physical interactions	
Resources			ne acoustics		In-air energy	
		Physic	al disturbance	e and		
		str	ike			
Military	Ingestible Material:	-	Military	None	•	
Expended	None		Recoverable	9		
Material	Non-Ingestible Material:		Material			
	None					
Sonar and	None				-	
Other	None					
Transducer						
Bins						
In-Water	None					
Explosive	None					
Bins						
Procedural	Physical Disturbance and Stri	ke · (Section 5	3 4)	<u> </u>		
Mitigation	Vessel movement	Re. (Section S.	.5.4)			
Measures	v C33CI IIIOVEIIIEIIL					
ivicasui es						

Other Testing	Other Testing Activities		
Chemical and Biological Simulant Testing			
Assumptions	Examples of chemical simulants include glacial acetic acid and triethyl phosphate.		
Used for	Examples of biological simulants are spore-forming bacteria, non-spore-forming bacteria, the protein		
Analysis	ovalbumin, MS2 bacteriophages, and the fungus Aspergillus niger.		

A.3.2.7.2 Insertion/Extraction

Other Testing A	ctivities				
Insertion/Extra					
Short	Testing of submersibles capa	able of inserti	ng and	Typical Dura	ntion
Description	extracting personnel and pa		nied		
	areas from strategic distanc	es.	'	Up to 30 days	
Long	Testing of submersibles cap	able of inserti	ng and extrac	ting personr	nel and payloads into denied
Description	areas from strategic distanc	es. Testing co	uld include th	e use of ford	ces deployed from submerged
	submarines while at sea.				
Typical	Platforms: Submarines				
Components	Targets: None				
	Systems being Trained/Tes	ted: Submersi	bles, sonar sy	stems, acou	istic modems
Standard	Vessel safety	Typical Loca	tions		
Operating		Range Com	plexes/Testin	g Ranges:	Inland Waters/Pierside:
Procedures		Key West			None
(Section 2.3.3)			ce Warfare Co	enter,	
		Panama	City Division		
Stressors to	Acoustic:	=	sturbance and		Energy:
Biological	Sonar and other	Vessels and	in-water dev	ices	None
Resources	transducers				
	Vessel noise	Ingestion:			Entanglement:
	l _ . .	None			None
	Explosives:				
	None				
Stressors to	Air Quality:			and Water	Quality:
Physical	Criteria air pollutants		None		
Resources	Habitats:				
	None				
Stressors to	Cultural Resources:	Socioeco	nomic Resou	rcoc:	Public Health and Safety:
Human	Physical disturbance and	Accessibi		ices.	Physical interactions
Resources	strike		disturbance a	nd strike	Underwater energy
Military	Ingestible Material:	Titysical c	Military	None	- Chackwater energy
Expended	None		Recoverable		
Material			Material		
	Non-Ingestible Material:				
	None				
Sonar and	Mid-Frequency:	Acoustic	Modems:	•	
Other	MF9	M3			
Transducer					
Bins					
In-Water	None				
Explosive					
Bins					
Procedural	None				
Mitigation					
Measures					
Assumptions	Test will not occur constant				
Used for					nly analyzed for the periods while
Analysis	the submarines are surfa	iced, typically	brief in natur	e. Mitigation	n measures related to vessel

Other Testing Activities		
Insertion/Extra	ction	
	movement are only considered during the period of surfacing as well.	
	For human resource stressor analysis, physical disturbance and strike and physical interactions are	
	only analyzed for the periods while the submarine are surfaced, typically brief in nature.	

A.3.2.7.3 Line Charge Testing

Other Testing A	Activities				
Line Charge Tes					
Short	Surface vessels deploy line of	charges to tost th	no T./	pical Dura	tion
Description	capability to safely clear an a forces.		ionary	day	tion
Long Description	Line charges are tested to verify the capability to safely clear surf zone areas for sea-based expeditionary operations. Testing is performed on various surf zone clearing systems that use either line charges or explosive arrays to neutralize mine threats. This is a systems development test and only assesses the in-water components of testing. Line charges consist of a 350-ft. detonation cord with explosives lined from one end to the other end in a series of 5-lb. increments.				
Typical Components	Platforms: Moored platforms, support craft Targets: None Systems being Trained/Tested: Submersibles				
Standard	Vessel safety	Typical Locatio			
Operating Procedures (Section 2.3.3)		Range Comple Naval Surface Panama Cit	xes/Testing Warfare Cer	_	Inland Waters/Pierside: None
Stressors to Biological Resources	Acoustic: Vessel noise Explosives: Underwater explosives	Physical Disturbance and Strike: Vessels and in-water devices Underwater explosives Military expended materials		Energy: None Entanglement: None	
	Officer water explosives	Ingestion: Military expen munitions	ided materia	ıls –	
Stressors to Physical Resources	Air Quality: Criteria air pollutants		Sediments a Explosives	nd Water	Quality:
	Habitats: Physical disturbance and striex expended material	ike – military			
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike Explosives	Socioeconomic Resources: Accessibility Airborne acoustics Physical disturbance and strike			Public Health and Safety: Physical interactions Underwater energy
Military Expended Material	Ingestible Material: Line charge fragments Non-Ingestible Material: None	R	Ailitary ecoverable Aaterial	None	
Sonar and Other Transducer Bins	None				
In-Water Explosive Bins	E14				-

Other Testing A	Activities	
Line Charge Tes	sting	
Procedural Mitigation Measures	Physical Disturbance and Strike: (Section 5.3.4) Vessel movement	Explosive Stressors: (Section 5.3.3) Line charge testing
Assumptions Used for Analysis	Test will not occur constantly over the duration o	f the allotted time.

A.3.2.7.4 Acoustic Component Testing

Other Testing A	ctivities				
Acoustic Compo					
Short	Various surface vessels, mod	ored equipment	, and Ty	pical Dura	tion
Description	materials are tested to evaluthe marine environment.	uate performan	ce in 1 c	1 day to multiple months	
Long Description	energy devices. Other surface Miscellaneous types of equipacoustic, optical, and air qual effectiveness, dependability variety of vessels for deploy subsurface.	yments, vessel e ce operations in pment are deploality instrument r, operational pa ment of test equ	entanglement volve manned oyed, includin ation to meas trameters, and uipment and f	systems, I and unm g tempera ure, recor I durabilit for the mo	materials testing, and renewable sanned surface vehicles. ature, humidity, magnetic, d, and analyze system y. Surface operations utilize a onitoring of the air, surface,
Typical		l systems, unma	nned surface	vehicles,	unmanned underwater vehicles
Components	Targets: None				
	Systems being Trained/Test			er commi	unication systems
Standard Operating Procedures (Section 2.3.3)	Unmanned aerial, surface, and subsurface vehicle safety	Range Comple South Florida Facility	exes/Testing	_	Inland Waters/Pierside: None
Stressors to Biological Resources	Acoustic: Sonar and other transducers	Physical Disturbance and Strike: Aircraft and aerial targets Vessels and in-water devices		Energy: None	
	Vessel noise Explosives: None	Ingestion: None			Entanglement: None
Stressors to Physical Resources	Air Quality: Criteria air pollutants Habitats:		Sediments ar None	nd Water (Quality:
	None				
Stressors to Human Resources	Cultural Resources: Physical disturbance and strike	Socioeconomic Resources: Accessibility Physical disturbance and strike		Public Health and Safety: Physical interactions Underwater energy	
Military Expended Material	Ingestible Material: None Non-Ingestible Material: None	1	Military Recoverable Material	None	
Sonar and Other Transducer	Low-Frequency: LF5	Forward-L FLS2	ooking Sonar	:	Synthetic Aperture Sonars: SAS2
Bins	Mid-Frequency: MF9	High-Frequency: HF5 HF7			

Other Testing A	Activities	
Acoustic Comp	onent Testing	
In-Water	None	
Explosive		
Bins		
Procedural	Acoustic Stressors: (Section 5.3.2)	Physical Disturbance and Strike: (Section 5.3.4)
Mitigation	Active sonar	Vessel movement
Measures		
Assumptions	None	•
Used for		
Analysis		

A.3.2.7.5 Non-Acoustic Component Testing

Other Testing Ac	tivities				
	mponent Testing				
Short	Testing of towed or floating	buoys for	Ту	pical Dura	ation
Description	communications through ra	dio-frequencie	es or	3 days (4 hours per day for 3 days)	
	two-way optical communica	itions betweer	n an 3		
	aircraft and underwater syst	tem(s).			
Long					cur from towed antennas from
Description	surface vessels, from single-	•			· ·
	1		=		tests may include communication
	•	_			ed underwater systems, and may
		ensors mounted on surface craft.			
Typical		boats, rotary	-wing aircraft (ınmanned	underwater vehicles, manned
Components	underwater vehicles				
	Targets: None	hadi Camanini			
Chandand	Systems being Trained/Test			<u> </u>	
Standard Operating	Vessel safety Aircraft safety	Typical Loca		Danes	Inland Waters /Dispelder
Procedures	Unmanned aerial, surface,	Gulf of Mex	olexes/Testing	Ranges:	Inland Waters/Pierside:
(Section 2.3.3)	and subsurface vehicle	Virginia Cap			None
(30000011 2.3.3)	safety	viigiilia Cap	e s		
Stressors to	Acoustic:	Physical Dis	turbance and	Strike:	Energy:
Biological	Aircraft noise	-	aerial targets		In-air electromagnetic
Resources	Vessel noise	Vessels and in-water devices devices			
		In continue			Entanglament
	Explosives:	Ingestion: None			Entanglement: None
	None	None		Notic	
Stressors to	Air Quality:		Sediments a	nd Water	Quality:
Physical	Criteria air pollutants		None		
Resources					
	Habitats:				
	None				210 0 10 10 10 10
Stressors to	Cultural Resources:		nomic Resourc	es:	Public Health and Safety:
Human Resources	Physical disturbance and strike	Accessibil Airborne	-		Physical interactions
Resources	Strike		acoustics listurbance and	d strika	In-air energy
Military	Ingestible Material:	Filysical C	Military	None	
Expended	None		Recoverable	None	
Material			Material		
	Non-Ingestible Material:				
	None				
Sonar and	None				
Other					
Transducer					
Bins	None				
In-Water	None				
Explosive Bins	Dhusiaal District		T 2 4)		<u>.</u>
Procedural	Physical Disturbance and St Vessel Movement	rike: (Section S	5.3.4)		
Mitigation	vessei ivioveitietit				
Measures	1				

Other Testing A	ctivities
Non-Acoustic Co	omponent Testing
Assumptions	None
Used for	
Analysis	

A.3.2.7.6 Payload Deployer Testing

Other Testing A	ctivities			
Payload Deploy				
Short	Launcher systems are tested	to evaluate	Tvp	ical Duration
Description	performance.	. to evaluate		days
Long	•	uate the performan		ent or future launchers, which are used to
Description	_	•		, sensors, unmanned underwater vehicles,
•				med from a fixed location or a mobile
		•	-	ment or mock equipment that is
	instrumented to evaluate th	e performance of th	e launche	r system. Various methods may be
				recovered after the test and are usually
	equipped with an acoustic lo			
Typical			-	nicles, support craft, surface combatants,
Components	unmanned surface vehicles,	unmanned underwa	ter vehicl	es
	Targets: None			
	Systems being Trained/Test			
Standard	Vessel safety	Typical Locations	<u> </u>	
Operating Procedures	Unmanned aerial, surface, and subsurface vehicle	Range Complexes	Testing R	_
(Section 2.3.3)	safety	Gulf of Mexico		None
(3800001 2.3.3)	salety	Jacksonville Northoast		
		Northeast Virginia Capes		
	1	Naval Undersea W	arfare Ce	nter
	1	Division, Newp		
Stressors to	Acoustic:	Physical Disturba		rike: Energy:
Biological	Vessel noise	Vessels and in-wa		<u>.</u>
Resources		Military expended	materials	3
	Explosives:			Entanglement:
	None	Ingestion:		Wires and cables
		Military expended		s – other
		than munitions		
Stressors to	Air Quality:			d Water Quality:
Physical	Criteria air pollutants	Met	als	Other materials
Resources	Habitata.			
	Habitats: Physical disturbance and stri	ko – military		
	expended material	in initiary		
Stressors to	Cultural Resources:	Socioeconom	ic Resour	ces: Public Health and Safety:
Human	Physical disturbance and stri			Physical interactions
Resources	,	Physical distu	bance an	•
Military	Ingestible Material:	Milit	ary	Heavyweight torpedoes (non-
Expended	End caps and pistons	Reco	verable	explosive), lightweight torpedoes
Material		Mate	rial	(non-explosive)
	Non-Ingestible Material:			
	Concrete slugs, heavyweight	-		
	accessories, lightweight to	orpedo		
	accessories, sabots			

Other Testing A	ctivities
Payload Deploy	rer Testing
Sonar and	None
Other	
Transducer	
Bins	
In-Water	None
Explosive	
Bins	
Procedural	Physical Disturbance and Strike: (Section 5.3.4)
Mitigation	Vessel movement
Measures	<u>_</u>
Assumptions	Instrumented operational equipment or mock equipment will be recovered.
Used for	Ships will not be conducting test constantly for the duration of the allotted time.
Analysis	Any acoustic sources used during this activity would be de minimis and not quantitatively analyzed
	and, therefore, are not included under systems.
	When chaff is used, 36 concrete slugs per event are expended.

A.3.2.7.7 Semi-Stationary Equipment Testing

Other Testing A	ctivities		
	y Equipment Testing		
Short	Semi-stationary equipment (o a hydrophonos) is	Typical Duration
Description	deployed to determine funct		From 20 minutes to multiple days
-			n a fixed site, suspended over the side of a boat,
Long Description	moored to the bottom, suspended in the water column, or on the surface. Examples of semi-stationary equipment include moored hydrophones (i.e., devices to listen to underwater sound), line arrays (i.e., multiple hydrophones) deployed on the ocean bottom, acoustic countermeasures, a moored oceanographic sensor that moves vertically through the water column, and sonobuoys (i.e., expendable sonar systems). Some units produce sound in the water (e.g., acoustic countermeasures), while others only listen (e.g., passive sonobuoys, vector sensors that measure particle motion). Some tests could require deployment in an area that provides opportunistic data collection (e.g., placing a hydrophone near a shipping lane to collect shipping noise data), or with specific geographic or oceanographic requirements.		
Typical	Platforms: : In-water structur	res, moored platforms, s	shore based facility, support craft
Components		_	targets, sub-surface targets, surface targets
		• , .	oustic countermeasures, sonar systems,
	underwater communication	•	
Standard	Vessel safety	Typical Locations	
Operating	Towed in-water device	Range Complexes/Tes	
Procedures	safety	Naval Surface Warfare	Center, Newport, Rhode Island
(Section 2.3.3)		Panama City Divisio	
		Naval Undersea Warfa	re Center
		Division, Newport	
Stressors to	Acoustic:	Physical Disturbance a	
Biological	Vessel noise	Vessels and in-water d	evices Lasers
Resources	Sonar and other		
	transducers	Ingestion:	Entanglement:
	Familia di cara	None	None
	Explosives:		
	None	.	
Stressors to	Air Quality:		its and Water Quality:
Physical		Matala	Other materials
PACALIFCAC	Criteria air pollutants	Metals	Other materials
Resources	·	Metals	Other materials
Kesources	Habitats:		Other materials
Kesources	Habitats: Physical disturbance and stril		Other materials
	Habitats: Physical disturbance and stril expended material	ke – military	
Stressors to Human	Habitats: Physical disturbance and stril expended material Cultural Resources:	ke – military Socioeconomic Re	esources: Public Health and Safety:
Stressors to	Habitats: Physical disturbance and stril expended material	ke – military Socioeconomic Re	esources: Public Health and Safety: Physical interactions
Stressors to Human	Habitats: Physical disturbance and stril expended material Cultural Resources:	ke – military Socioeconomic Re ke Accessibility	Public Health and Safety: Physical interactions In-air energy
Stressors to Human	Habitats: Physical disturbance and stril expended material Cultural Resources:	ke – military Socioeconomic Reke Accessibility Airborne acoustics	Public Health and Safety: Physical interactions In-air energy
Stressors to Human Resources	Habitats: Physical disturbance and stril expended material Cultural Resources: Physical disturbance and stril	ke – military Socioeconomic Re ke Accessibility Airborne acoustics Physical disturban	Public Health and Safety: Physical interactions In-air energy ce and strike Underwater energy Towed surface targets
Stressors to Human Resources	Habitats: Physical disturbance and stril expended material Cultural Resources: Physical disturbance and stril Ingestible Material: None	ke – military Socioeconomic Reke Accessibility Airborne acoustics Physical disturban Military	Public Health and Safety: Physical interactions In-air energy ce and strike Underwater energy Towed surface targets
Stressors to Human Resources Military Expended	Habitats: Physical disturbance and stril expended material Cultural Resources: Physical disturbance and stril Ingestible Material: None Non-Ingestible Material:	Socioeconomic Reke Accessibility Airborne acoustics Physical disturban Military Recovera Material	Public Health and Safety: Physical interactions In-air energy ce and strike Underwater energy Towed surface targets
Stressors to Human Resources Military Expended	Habitats: Physical disturbance and stril expended material Cultural Resources: Physical disturbance and stril Ingestible Material: None Non-Ingestible Material: Acoustic countermeasures, e	Socioeconomic Reke Accessibility Airborne acoustics Physical disturban Military Recovera Material	Public Health and Safety: Physical interactions In-air energy ce and strike Underwater energy Towed surface targets
Stressors to Human Resources Military Expended	Habitats: Physical disturbance and stril expended material Cultural Resources: Physical disturbance and stril Ingestible Material: None Non-Ingestible Material:	Socioeconomic Reke Accessibility Airborne acoustics Physical disturban Military Recovera Material	Public Health and Safety: Physical interactions In-air energy ce and strike Underwater energy Towed surface targets

Other Testing A	ctivities							
Semi-Stationary	y Equipment	t Testing						
Sonar and	Low-Frequency:		Anti-Subm	Anti-Submarine Warfare:		Swimmer Defense:		
Other	LF4	LF5	ASW3	ASW4	SD1	SD2		
Transducer								
Bins	Mid-Frequ	iency:	High-Frequ	iency:	Airgun:			
	MF9	MF10	HF5	HF6	AG			
In-Water	None	-		<u>-</u>	-	·		
Explosive								
Bins								
Procedural	Acoustic S	tressors: (Section	5.3.2)	Physical Dis	turbance and S	trike: (Section 5.3.4)		
Mitigation	Active son	ar		Vessel move	ement			
Measures	Air guns							
Assumptions	None							
Used for								
Analysis								

A.3.2.7.8 Towed Equipment Testing

Other Testing	Activities					
Towed Equipm						
Short	Surface vessels or unmanned	surface vehic	les Ty	pical Dura	tion	
Description	deploy and tow equipment to determine					
·	functionality of towed system		Ту	pically 2-8	hours	
Long	Testing is conducted on equip		uate hydrodyna	mic charac	teristics and control of a tow	
Description	body, test fully functional iten					
·	functional item. A typical test operation for towed equipment testing involves a deployment,					
	recover scenario that requires range or commercial craft support. This equipment may be deployed from and towed by range craft or unmanned surface vehicles. The towed item may be underwater or					
	floating on the surface. Equipment may be acoustically active or produce radio frequency					
	transmissions.					
Typical	Platforms: Support craft, unm	nanned surfac	e vehicles			
Components	Targets: Sub-surface targets					
	Systems being Trained/Teste	d: Sonar syste	ems, underwate	r commun	ication systems	
Standard	Vessel safety	Typical Loca	tions			
Operating	Unmanned aerial, surface,	Range Com	plexes/Testing	Ranges:	Inland Waters/Pierside:	
Procedures	and subsurface vehicle		rsea Warfare C		None	
(Section	safety	Division,	Newport			
2.3.3)	Towed in-water device					
	safety					
Stressors to	Acoustic:	-	sturbance and S		Energy:	
Biological	Sonar and other transducers		in-water device	es	Lasers	
Resources	Vessel noise	el noise Seafloor devices			_	
	l ₋				Entanglement:	
	Explosives:	Ingestion:			None	
		None None				
Stressors to	Air Quality:		Sediments a	nd Water (Quality:	
Physical	Criteria air pollutants		Metals			
Resources	Habitats:					
		e – seafloor				
	Physical disturbance and strike – seafloor devices					
Stressors to	Cultural Resources:	Socion	conomic Resou	rcoc:	Public Health and Safety:	
Human	Physical disturbance and strike		al disturbance a		Physical interactions	
Resources	i nysicai distarbance ana strik	Accessi		iiu strike	In-air energy	
		7100033	Sincy .		Underwater energy	
Military	Ingestible Material:		Military	None		
Expended	None		Recoverable	None		
Material			Material			
	Non-Ingestible Material:					
	Mines (non-explosive), station	nary				
	artificial targets				·	
Sonar and	Low-Frequency:	Mid-Fre	quency:		High-Frequency:	
Other	LF4	MF9			HF6	
Transducer						
Bins						
In-Water	None					
Explosive						
Bins						

Other Testing A	Activities	
Towed Equipm	ent Testing	
Procedural	Acoustic Stressors: (Section 5.3.2)	Physical Disturbance and Strike: (Section 5.3.4)
Mitigation	Active sonar	Vessel movement
Measures		Towed in-water devices
Assumptions	None	
Used for		
Analysis		

A.3.3 OFFICE OF NAVAL RESEARCH TESTING ACTIVITIES

A.3.3.1 Acoustic and Oceanographic Science and Technology

A.3.3.1.1 Acoustic and Oceanographic Research

Acoustic and Oc	ceanographic Science and Tec	hnology			
Acoustic and Oc	ceanographic Research				
Short	Research using active transr	missions from sources	Typical Dura	ition	
Description	deployed from ships, aircraf				
	underwater vehicles. Resear		Up to 14 day	/S	
	-	sed as proxies for current and future Navy			
	systems.	1.6			
Long				sources, validation of ocean	
Description				erization of acoustic interactions	
				aphic research sensing (acoustic	
The section of	Doppler current profiler, fat			oyea.	
Typical	Platforms: Special mission s	-	ater venicies		
Components	Targets: Sub-surface targets		ms sanahua.	dam.uatar.cammunication	
	_ =	tea: Airguns, sonar syste	ms, sonobuoys	s, underwater communication	
Chandand	systems, low-power lasers	Tourisal Laurettana			
Standard	Vessel safety Unmanned aerial, surface,	Typical Locations			
Operating Procedures	and subsurface vehicle	Range Complexes/Tes	ting Ranges:	Inland Waters/Pierside:	
(Section 2.3.3)	safety	Gulf of Mexico		None	
(3800001 2.3.3)	safety	Northeast			
		Virginia Capes			
Stressors to	Acoustic:	Physical Disturbance a		Energy:	
Biological	Sonar and other	Aircraft and aerial targ		In-air electromagnetic	
Resources	transducers	Vessels and in-water d		devices	
	Vessel noise	Military expended mat	teriais	Lasers	
	Aircraft noise	Seafloor devices		Entanglement:	
	Evalosivos	Ingestions		Small	
	Explosives: Underwater explosives	Ingestion: Military expended mat	erials — other	decelerators/parachutes	
	Officer water explosives	than munitions	eriais – Otriei	Wires and cables	
Stressors to	Air Quality:	· · · · · · · · · · · · · · · · · · ·	ts and Water	-	
Physical	Criteria air pollutants	Explosive		_	
Resources	Criteria dii poliatarits	Chemica		Other materials	
nesources	Habitats:	Chemica	15	other materials	
	Physical disturbance and stri	ike – military			
	expended material	ince miniculy			
	Physical disturbance and stri	ike – seafloor			
	devices				
Stressors to	Cultural Resources:	Socioeconomic Reso	ources:	Public Health and Safety:	
Human	Physical disturbance and	Accessibility		Physical interactions	
Resources	strike	Physical disturbance	and strike	In-air energy	
	Explosives	·		Underwater energy	
					

Acoustic and O	ceanographic Science and Technol	logy		
Acoustic and O	ceanographic Research			
Military	Ingestible Material:		Military	Anchors, mine shapes (non-explosive),
Expended	Small decelerators/parachutes		Recoverable	target fragments (recovered)
Material	Non-Ingestible Material: Mine shapes (non-explosive), sonobuoys (non-explosive), so wires, stationary artificial targe		Material	
Sonar and	Low-Frequency:	Mid-Free	quency:	Airgun:
Other	LF3 LF5	MF8	MF9	AG
Transducer	LF4			
Bins			marine Warfare:	
		ASW2		BB4
In-Water	E3			
Explosive Bins				
Procedural	Acoustic Stressors: (Section 5.3.2	2)	Physica	l Disturbance and Strike: (Section 5.3.4)
Mitigation	Active sonar		Vessel ı	movement
Measures	Airguns			
			=	ve Stressors: (Section 5.3.3)
			•	ve mine countermeasure and
			neu	tralization activities
Assumptions	None			
Used for				
Analysis				

A.3.3.1.2 Emerging Mine Countermeasure Technology Research

Acoustic and Oc	ceanographic Science and Tec	chnology				
	Countermeasure Technology					
Short	Test involves the use of broa	adband acoustic	c 1	ypical Dura	ntion	
Description	sources on unmanned unde			Up to 14 days		
Long	Mine countermeasure system testing on unmanned underwater vehicles to take place offshore and					
Description	in coastal waters. Broadband acoustic sources on unmanned underwater vehicles will use					
	downward directed acoustic	c transmissions	to character	ize the ocea	an bottom. Inert objects will be	
	placed on the bottom to test system performance.					
Typical	Platforms: Special mission s	hips, unmanne	d underwate	r vehicles		
Components	Targets: Mine shapes					
	Systems being Trained/Test					
Standard	Vessel safety	Typical Locati				
Operating	Unmanned aerial, surface,	Range Compl	exes/Testin	g Ranges:	Inland Waters/Pierside:	
Procedures (Section 2.3.3)	and subsurface vehicle safety	Jacksonville Northeast			None	
(36011011 2.3.3)	salety					
Stressors to	Acoustic:	Virginia Cape Physical Dist		Striko	Enorgy	
Biological	Sonar and other	Vessels and i			Energy: In-air electromagnetic	
Resources	transducers	VC33C13 dild li	ii watei aevi	ccs	devices	
	Vessel noise Ingestion:					
		None			Entanglement:	
	Explosives:				None	
	None					
Stressors to	Air Quality:	Sediments and Water Quality:				
Physical	Criteria air pollutants					
Resources	11-1-2					
	Habitats: None					
Stressors to	Cultural Resources:	Socioecon	omic Resoui	.coc.	Public Health and Safety:	
Human	Physical disturbance and	Accessibilit		ces.	Physical interactions	
Resources	strike		sturbance ar	nd strike	In-air energy	
		,			Underwater energy	
Military	Ingestible Material:		Military	Mine	shapes (non-explosive)	
Expended	None		Recoverable	•		
Material			Material			
	Non-Ingestible Material:					
	None				-	
Sonar and	Broadband:					
Other Transducer	BB1 BB2					
Bins						
In-Water	None				·	
Explosive	TVOTIC					
Bins						
Procedural	Physical Disturbance and St	rike: (Section 5.	.3.4)	-	-	
Mitigation	Vessel movement	•	•			
Measures						

Acoustic and Oceanographic Science and Technology			
Emerging Mine Countermeasure Technology Research			
Assumptions	None		
Used for			
Analysis			

A.3.3.1.3 Large Displacement Unmanned Underwater Vehicle Testing

Acoustic and O	ceanographic Science and Tec	chnology					
Large Displacer	nent Unmanned Undersea Ve	ehicle Testing					
Short	Autonomy testing and envir	onmental data	Тур	oical Dura	ition		
Description	collection with Large Displac	cement Unmanne	d II.	Up to 60 days per deployment			
	Undersea Vehicles (Innovati	ive Navy Prototyp	e). Up				
Long	Large Displacement Unmanned Undersea Vehicle Innovative Navy Prototype (LDUUV INP) testing						
Description	includes launch, autonomous transit (up to 60 days), environmental data collection (e.g.,						
		•	-		nd retrieval. LDUUV INP testing		
	_			ic sources	s (modems, imaging sonars and		
	fathometers) for safe naviga		lection.				
Typical	Platforms: Unmanned unde						
Components	Targets: Sub-surface targets						
	Systems being Trained/Tes			onmenta	l data collection systems		
Standard	Vessel safety	Typical Location					
Operating	Unmanned aerial, surface,	Range Complex	es/Testing	Ranges:	Inland Waters/Pierside:		
Procedures	and subsurface vehicle	Gulf of Mexico			None		
(Section	safety	Jacksonville					
2.3.3)		Navy Cherry Poi	int				
		Northeast					
<u> </u>		Virginia Capes					
Stressors to	Acoustic:	Physical Disturb			Energy:		
Biological	Vessel noise	Vessels and in-v	vater device	es	None		
Resources	Evalosivos	Ingostion			Entanglament		
	Explosives: None	Ingestion: None			Entanglement: None		
Stressors to	Air Quality:		diments an	nd Water			
Physical	Criteria air pollutants		one	.a rrate.	Quanty.		
Resources	Habitats: Physical disturbance and strike – military						
	expended material						
Stressors to	Cultural Resources:	Socioeconom	ic Resource	es:	Public Health and Safety:		
Human	Physical disturbance and	Accessibility			Physical interactions		
Resources	strike	Physical distu		strike			
Military	Ingestible Material:		litary	None			
Expended	None		coverable				
Material	Non-Ingestible Material:	Ma	aterial				
	Stationary artificial targets						
Sonar and	None						
Other							
Transducer							
Bins	_						
In-Water	None						
Explosive							
Bins							
Procedural	Physical Disturbance and St	rike: (Section 5.3.	4)				
Mitigation	Vessel movement						
Measures							

Acoustic and O	Acoustic and Oceanographic Science and Technology			
Large Displacement Unmanned Undersea Vehicle Testing				
Assumptions	Any acoustic sources used during this activity would be de minimis and not quantitatively analyzed			
Used for	and therefore are not included under systems.			
Analysis				