

Executive Summary

This Environmental Assessment (EA)/Overseas Environmental Assessment (OEA) (herein referred to as EA) has been prepared by the U.S. Department of the Navy (DoN) to evaluate potential environmental impacts of the Program Definition and Risk Reduction Phase for the Advanced Deployable System (ADS), a passive acoustic undersea surveillance system. Specifically, this EA evaluates four ocean tests proposed for locations within and beyond territorial seas associated with acquisition approval of ADS.

ADS consists of sensors connected by cables placed on the ocean floor designed to "listen" to sounds produced by vessels operating in shallow waters. The Navy proposes to use ADS to help detect underwater and surface marine vessel activity. To the greatest extent possible, ADS components have been and will continue to be tested in the laboratory. However, to obtain realistic testing conditions and to deploy full-scale hardware, certain tests must be performed in the ocean environment. Four tests over a 3-year period are proposed to evaluate the capability and performance of ADS. A summary of each of the four tests and the parameters of each test is provided in Table ES-1.

Table ES-1. Summary of ADS Ocean Tests

Key Test Parameters	Test 1 Multinode Test (MNT)	Test 2 Development Test-ID	Test 3 Integrated Deployment Test (IDT)	Test 4 All Optical Deployable System (AODS)
TEST CHARACTERISTICS				
Maximum Test Period	70 days	150 days	15 days	30 days
Number of Test Vessels	2	2	2	2
Nodes/Fingers	4/1	20/5	1/1	3/1
Total Length of Cable	130 km	550 km	50 km	150 km
Remotely Operated Vehicle	Yes	Yes	Yes	Yes
Battery Type	Lithium	Lithium	Alkaline	Alkaline
Maximum Number of Batteries	4	20	1	3
Shore Station	Yes	Yes	Yes	Yes
Wet-end Inspection and Repair ¹	Yes	Yes	Yes	Yes
Component Retrieval ²	Yes	Yes	Yes	Yes
ACOUSTIC PARAMETERS				
Maximum Active Acoustic Testing	480 hours	720 hours	48 hours	96 hours
Pulsed Sound Source				
Total Number of Hours of Operation ³	32 hours	48 hours	8 hours	16 hours
Source Level	120-175 dB	120-175 dB	120-175 dB	120-175 dB
Frequency Range	20-1000 Hz	20-1000 Hz	20-1000 Hz	20-1000 Hz
Signal Duration	0.25 to 10 seconds	0.25 to 10 seconds	0.25 to 10 seconds	0.25 to 10 seconds

Range of Time between Pulses	1.75 seconds to days			
Continuous Sound Source				
Total Number of Hours of Operation ³	448 hours	672 hours	40 hours	80 hours
Continuous Source Level Range	130-170 dB	130-170 dB	130-170 dB	130-170 dB
No. of hours less than 140 dB	335 hours	426 hours	17 hours	50 hours
No. of hours between 140 and 170 dB	113 hours	246 hours	23 hours	30 hours
Frequency Range	20-1000 Hz	20-1000 Hz	20-1000 Hz	20-1000 Hz
Light Bulb Acoustic Tests				
Number of Lightbulb Tests	32	96	16	48
Duration of Pulse for Lightbulb Tests	1.8 ms	1.8 ms	1.8 ms	1.8 ms
Time between Implosions	20-30 minutes	20-30 minutes	20-30 minutes	20-30 minutes

¹ Wet-end inspection and repair would occur only as required.

² Plastic clips used to hold shells together in canister would not be retrieved (5 for Test 1, 30 for Test 2). No clips are used for Tests 3 and 4.

³ The total hours for continuous sound source do not represent constant transmission since some time would elapse between sound source operations.

Activities associated with the four proposed ocean tests would primarily include the following: establishment of a temporary shore station, deployment of the system, inspection and operation of the system, and retrieval of the system.

Establishment of a Temporary Shore Station. A temporary land-based shore station would be constructed and used for receiving, processing, displaying, and storing data.

Deployment of the System. A full scale deployment of the ADS system in the ocean would include: testing of handling and deployment systems; lowering and towing a Towed Deployment Vehicle (TDV) through the water column; releasing shells and associated hardware from the TDV; deploying cable and associated hydrophones to the sea floor; deploying a junction box on the sea floor; and deploying a shore landing cable from the junction box to the shore station (which would require some onshore trenching activities).

Inspection and Operation of the System. Although ADS is a passive acoustic system, it is necessary to produce pulsed and continuous sound during the ocean tests. Two different active acoustic methods are proposed: a towed sound source and a simple system involving the implosion of lightbulbs. Inspection and repair of the ADS system would be performed only as required.

Retrieval of the System. Retrieval of all components except for the shore landing cable would occur after completion of Tests 1 and 2. The system components would then be re-deployed for Test 3, retrieved after Test 3, re-deployed for Test 4, and retrieved following Test 4. Retrieval of the components would occur within 6 months of the completion of each test; however, the shore landing cable would be installed prior to Test 1 and remain in place during all four tests and be retrieved upon completion of Test 4.

As part of the ADS ocean tests, two surface vessels would be used to support deployment, inspection and operation (active acoustic testing), and retrieval of the system. Although ADS would not use active acoustics, it would be necessary to use an active acoustic test source to produce pulsed and continuous sounds during the

proposed tests to evaluate ADS listening capabilities on the sea floor. The tests would occur over a 3-year period. Once the system has been deployed, the maximum days of operation for all four tests would be approximately 265 days; however, all tests would not occur continually. A maximum of 1,344 hours of active acoustic testing (104 hours of pulsed sound source and 1,240 hours of continuous sound source) is proposed over the 3-year period. As shown in Table ES-1, maximum test periods would consist of 70 days for Test 1, 150 days for Test 2, 15 days for Test 3, and 30 days for Test 4, including installation, data collection, and retrieval.

Personnel required for the ocean tests (approximately 24 shipboard personnel [16 scientists and 8 crew members] and 30 shore station personnel) consist of those required to prepare test plans and procedures, assemble and inspect equipment prior to the start of at-sea testing, deploy in-water components, conduct various tests, collect data, retrieve equipment, analyze test results, and prepare reports. In many cases, several of these tasks would be performed by the same person.

The DoN proposes to conduct these tests within the marine environment of southern California, between Point Conception and the U.S.-Mexican border. The proposed footprint area encompasses the California Channel Islands. The laydown of the system would occur within a portion of the footprint area; however, the specific laydown of the system is classified (Appendix A).

A shore station is proposed within the southwestern portion of Marine Corps Base (MCB) Camp Pendleton adjacent to the Marine Corps Tactical Systems Support Activity (MCTSSA) facility. The shore station would be a land-based, portable, temporary facility used for receiving, processing, displaying, and storing data. The proposed shore station site has ample room to park up to eight support International Standards Organization-vans (ISO-vans). Implementation of the proposed shore station would require some improvements, including upgrades to an existing access road, installation of security fencing, and construction of concrete slabs to support the ISO-vans.

To use the shore station for receiving and processing the data associated with the ADS ocean tests, a shore landing cable must be connected from a junction box located offshore to the shore station site. Installation of the cable would require trenching and backfilling across the beach and into the surf zone to bury the cable. The cable would be laid at low tide and buried about 6 feet (ft) (2 meters [m]) deep from low-water depth through the tidal zone. The trench across the beach would be a maximum of 250 ft (76 m) in length, 2 ft (0.6 m) wide, and 6 ft (2 m) deep.

Alternatives to the proposed ADS ocean tests include alternative test sites and the No-Action Alternative. Systematic operational parameters were analyzed to determine reasonable site locations for conducting the ADS ocean tests. The siting process involved the development of specific operational siting criteria based on test objectives, which included the following:

- operational realism (adequate laydown area/depth);
- survivability (weather conditions/level of fishing/terrain);
- scheduling (low potential for schedule change);
- availability (accessibility); and
- supportability (necessary amenities).

Once operational criteria were identified, various regions were considered in a tiered analysis to identify potential siting locations for conducting ADS ocean tests. Operational criteria were first used to eliminate general areas from further consideration and to compare advantages and disadvantages of potential alternative sites. Sites considered included the following:

- foreign sites;
- sites within U.S. coastal waters; and
- sites along the west coast of the continental U.S. (CONUS).

Foreign sites for ADS ocean tests were eliminated from further consideration due to the following reasons:

- high potential for schedule changes, or equipment damage due to weather, political atmosphere, or unknown variables;
- sites outside the U.S. are not easily accessible by Fleet assets;
- support functions (e.g., electricity, lodging, etc.) are highly variable;
- excessive costs;
- security of the system; and
- classified nature of the project could not be disclosed to foreign government.

Therefore, U.S. coastal waters were identified as the only viable siting option (Alaska was eliminated due to extreme weather conditions).

In the next tier of analysis, based on the alternatives analysis, the east coast, Hawaii, and the Gulf Region were eliminated from further consideration because they did not meet all operational siting criteria. Based on this tiered analysis, the west coast was identified as the only area that met all operational siting criteria for implementation of the ADS ocean tests.

Once the west coast was identified as the only region which met all operational siting criteria, specific west coast ocean test site locations were evaluated. More detailed operational criteria were used to further determine the characteristics of four proposed ocean test locations (shore station sites to support the ADS ocean tests were identified for each potential ocean site location). Of the four ocean test site locations, two locations did not meet all operational criteria; therefore, these locations were eliminated from further consideration. The two locations that satisfied all required operational criteria and could support a shore station site are analyzed in the EA. These two locations consist of the proposed ADS ocean test site, located within Southern California, and the alternative ADS ocean test site, located within the Pacific Northwest.

In support of the ADS ocean tests, a temporary shore station site would be used. The EA evaluates impacts associated with the proposed shore station, located adjacent to MCTSSA at MCB Camp Pendleton. In addition, two alternative shore station sites are evaluated: the Pacific City Alternative, located at an existing telecommunications facility in Pacific City, Oregon, and the MCB Camp Pendleton Alternative, located adjacent to the Landing Craft Air Cushion (LCAC) facility just north of the proposed shore station.

The only alternative to performing the proposed ocean tests would be to simulate the ocean environment through laboratory testing. This alternative does not meet the purpose and need of the ADS ocean tests since real-world conditions are necessary to verify and validate ADS capabilities; therefore, this alternative was not analyzed in the EA.

Under the No-Action Alternative, the proposed action would not be implemented and the purpose and need for ADS acquisition approval would not be met. ADS was created in direct response to an identified, documented, and validated mission and need; if these tests are not conducted, the Navy's objective of developing ADS could not be met.

The EA describes current baseline conditions and evaluates potential impacts from implementation of ADS ocean testing at the proposed ADS ocean test location, the alternative ADS ocean test location, and the proposed and alternative shore station sites, as well as identifying potential impacts resulting from selection of No-Action Alternative. A portion of the proposed project would be located outside territorial waters; therefore, to comply with Executive Order (EO) 12114, *Environmental Effects Abroad of Major Federal Actions*, the EA includes descriptions of baseline conditions and environmental consequences within and outside territorial waters. The following environmental resources are addressed in the EA: geology, topography, and soils; air quality; marine environment; marine biology; marine mammals; terrestrial biology; land use, transportation and recreation; socioeconomics; noise; cultural resources; and safety and environmental health. The key issue

identified during preparation of this EA was the potential for acoustic impacts on fish and marine mammals. However, the analysis of potential acoustic impacts demonstrated that significant impacts on fish and marine mammals would not occur as a result of implementation of the proposed ADS ocean tests.

National Research Council (NRC) reported that National Oceanic and Atmospheric Administration/National Marine Fisheries Service (NOAA/NMFS) recommended (on an interim basis) the use of sound source levels 80 to 100 dB above absolute hearing threshold as harassment levels based on annoyance or TTS (See NRC 1996). Absolute hearing thresholds for odontocetes and pinnipeds in the band of sensitive hearing tend to fall in the range 40 to 80 dB (re 1 μ Pa), consistent with the lowest observed ambient noise levels in those bands. There are no measurements of hearing sensitivities for mysticetes, but for the low band (below 500 Hz), noise band levels in the quietest locations generally exceed 80 dB. Based upon the NOAA/NMFS recommendation, the harassment thresholds for mysticetes would then fall in the range from about 160 dB to 180 dB (re 1 μ Pa), depending on species, frequency, duration, waveform, etc. NMFS is re-examining sound pressure level thresholds in the context of the definition of harassment. For this EA, the Navy will take the conservative approach of mitigating to the range at which the level is estimated to be 120 dB or less for continuous sound and 160 dB or less for pulsed sound. In this case, the ADS program can meet the testing requirements while mitigating to these very conservative sound levels.

Mitigation Measures

In the resource-specific analysis as described in Sections 4.1 through 4.11 of this EA, no significant impacts have been identified. The proposed ADS tests and establishment of the proposed shore station are not intrusive and have been designed to minimize environmental impacts. Mitigation measures for marine mammals were established based on predicted received sound levels relative to distance from the sound sources as shown in Table ES-2.

Table ES-2. Predicted Received Sound Levels Relative to Distance from Sound Source

	<u>Received Sound Levels</u>		
Source Level	120 dB	140 dB	160 dB
175 dB (pulsed)	1,800 ft (560 m)	184 ft (56 m)	20 ft (6 m)
170 dB (continuous)	1,050 ft (320 m)	105 ft (32 m)	10 ft (3 m)

The following mitigation measures have been recommended and incorporated into the ADS ocean test program to minimize any potential for acoustic impacts on marine mammals (Table ES-3).

Table ES-3. Mitigation Measures for Marine Mammals during ADS Ocean Tests Acoustic Transmissions

<u>Acoustic Source</u>		<u>Watch Type¹</u>		
Continuous	Pulsed	Ship's	Dedicated	Operations Curtailed²
< 140 dB		√		Any marine mammal within 33 ft (10 m)

140-170 dB ³			√	Mysticetes within: 1,050 ft (320 m) @ 170 dB 330 ft (100 m) @ 160 dB 105 ft (32 m) @ 150 dB 33 ft (10 m) @ 140 dB
140-170 dB ³		√		Pinnipeds or odontocetes within 1,050 ft (320 m) for more than 0.5 hour
	160-175 dB	√		Any marine mammal within 33 ft (10 m)
¹ A ship's or dedicated watch will begin 20 minutes before the start of any acoustic transmission and will continue for the duration of the transmission.				
² Operations would also be curtailed if sea turtles are observed.				
³ Acoustic transmission during daylight hours only.				

For the proposed ADS ocean tests, two types of visual searches for marine mammals would be conducted: (1) a *ship's watch* by the operations personnel, and (2) a *dedicated watch* by at least two personnel specifically trained in marine mammal identification. A ship's watch of surrounding waters would be conducted at least 20 minutes before and continuing during any pulse or continuous sound source transmission.

For continuous sound source transmissions, a ship's watch by operations personnel would be conducted at all times during transmissions less than 140 dB re 1 μ Pa-m. Operations would be curtailed only if marine mammals approach within 33 ft (10 m) of the towed sound source projector during continuous sound transmission at less than 140 dB re 1 μ Pa-m.

When active acoustics involve continuous sound source transmission greater than 140 dB, a dedicated watch would be conducted. Continuous sound source transmission between 140 and 170 dB re 1 μ Pa-m would be conducted only during daylight hours and when visibility is not limited by weather conditions (e.g., fog, adverse sea state). Transmissions would be curtailed in accordance with Table 4-5.

Because pinnipeds (seals and sea lions) and odontocetes (toothed whales: dolphins, porpoises, etc.) do not have good hearing below 1 kHz, continuous sound source, transmissions between 140 and 170 dB re 1 μ Pa-m would continue unless pinnipeds and/or odontocetes remain within 1,050 ft (320 m) of the sound source for periods greater than one-half hour. If pinnipeds or odontocetes remain during continuous sound source transmissions over one-half hour, transmissions would be stopped.

At the start of sound source transmission, the transmission level would be increased gradually or ramped-up from an overall level less than or equal to 140 dB re 1 μ Pa-m to the desired operating level, at a rate not exceeding 6 dB re 1 μ Pa-m per minute. Although there was some discussion as to the utility of ramp-up procedures at a recent Office of Naval Research (ONR) Workshop (ONR 1998), it is thought that such procedures may allow any marine mammals near the sound source projector during the onset of test operations the opportunity to move away before being exposed to maximum levels. To ensure implementation, this action would be a test requirement and would be added to the test plan for all ADS ocean tests.

If any marine mammals are attracted to sounds associated with the ADS ocean test operations, they may actually approach or remain in the test area. Such long-term exposure should be avoided to mitigate potential hearing damage to marine mammals. Although such behavior is not anticipated for any species, active acoustic transmissions would be delayed in accordance with the proposed mitigation measures outlined in Table 4-5 (refer to Section 4.5.2.5).

The following mitigation measures for threatened and endangered terrestrial species have been proposed to ensure that trenching activities associated with placement of the shore landing cable would not adversely impact the western snowy plover. All activities associated with trenching would occur outside the plover breeding season (1 March - 15 September). In addition, if any repairs are needed to the buried shore landing cable during the plover breeding season, all activities would be coordinated with MCB Camp Pendleton Environmental Security personnel and U.S. Fish and Wildlife Service (USFWS) prior to any beach or dune disturbance.

Summary of Impacts

In defining significant impacts, the National Environmental Policy Act (NEPA) requires the consideration of context and intensity. The significance of an action must be analyzed in several contexts such as society as a whole, the affected region, the affected interests, and the locality. Intensity refers to the magnitude of the potential effect (i.e., the degree of reach in terms of strength, force, or energy per unit [e.g., time]). The analysis carried forth in the EA addresses the impacts of the proposed ADS tests within the spatial and temporal boundaries of test implementation. The proposed activity of laying cable and self-contained electronics, the use of typical seagoing vessels, and the short-term use of artificial underwater sound sources (the projector and implosion of lightbulbs) have all been found to have highly localized influences (i.e., small regions of potential impact) that preclude the need to look at larger areas of influence. Thus, the context of potential impact for the ADS activities is limited to localized site-specific regions surrounding the laydown areas.

Changes in the environment would be limited to a total of 265 days over a period of three years for all four proposed tests. Upon completion of the tests, the marine environment within the proposed footprint area would remain essentially unchanged from its condition prior to the proposed action.

Intensity of impacts are measured against specific evaluative factors including public health; unique characteristics (e.g., wetlands and sensitive ecological features); degree of controversy; degree of unknown or uncertain risk; precedent-setting impact; cumulative impact; archaeological and historic resources; special status species; and the potential to violate federal, state, and local laws. Based upon the detailed analysis presented in this EA, the intensity of effects associated with implementation of the proposed action is not significant since the proposed ADS tests consist of highly localized, discrete actions that do not add in a cumulative manner to other activities in the general region. The ADS ocean tests would have no significant impact on federally protected threatened and endangered marine or terrestrial species. Air emissions associated with the proposed project would be consistent with the relevant State Implementation Plans (SIPs). The proposed action complies with considerations regarding environmental justice and protection of children because it would not disproportionately affect human health or the environment in low-income, minority, or disadvantaged populations (including children). There are no known archaeological resources that would be affected with implementation of the proposed action; therefore, there would be no significant impacts on cultural resources. The review for consistency with applicable environmental requirements at the federal, state, and local level found no threat of violation associated with the proposed action. This document satisfies the requirement for Executive Order (EO) 12114. As discussed in the joint EA/OEA, no significant harm would occur to the global commons as a result of implementation of the proposed action.

Therefore, the intensity of impacts caused by implementation of the proposed action would be less than significant. No significant impacts would result from implementation of the proposed action, use of the alternative Pacific Northwest site, use of the proposed or alternative shore station sites, or the No-Action

Alternative. Summaries of the proposed ADS ocean test location, the alternative test location, and the No-Action Alternative's potential effects on each of the resource areas are provided in Table ES-4.

Table E-4 follows