

# NAVY

## Hawaii-Southern California Training and Testing EIS/OEIS

### Importance of Training and Testing with Active Sonar

**The U.S. Navy is committed to protecting the marine and coastal environments of Hawaii and Southern California and employs protective measures to reduce potential environmental harm from training and testing activities.**

*Need for Sonar Training and Testing.* The U.S. Navy strives to protect marine life when conducting training and testing activities. At the same time, more than 300 extremely quiet diesel-electric submarines are operated by more than 40 nations worldwide and these numbers are growing. The presence of these quiet, difficult to detect submarines presents



serious threats to national security, our nation's economic vitality and the safety of our armed forces. As a result, anti-submarine warfare is the number one war-fighting and training priority for the U.S. Pacific Fleet. The Navy's anti-submarine training and testing activities include the use of active sonar and explosives, which prepares and equips Sailors for countering submarine threats. The development of anti-submarine detection and weapons systems is also a priority for the U.S.

With advances in warfare technology, new submarines using batteries and air independent propulsion technology are extremely quiet and hard to detect. Currently, active sonar is the most effective method of detecting these quiet submarines.

life combat situations. This training cannot be duplicated with simulators or other artificial means.

*Sonar Testing.* Scientific research, acquisition, maintenance and repair require pier-side and at-sea testing to deliver combat-ready weapons systems to naval forces. Some of the weapons systems requiring testing are sonar systems. Conducting scientific research on new sonar technology and existing sonar systems, acquiring new systems and maintaining current systems is vital to equip and maintain combat-ready naval forces capable of winning wars.

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*Sonar Training.* Sonar proficiency and development demands training in realistic conditions at sea. Lack of realistic training could jeopardize the lives of Sailors in real-

### Training and Testing in a Noisy Environment

Sound levels in the ocean are not constant, but differ from location to location and change with time. Different sources of sound contribute to the overall noise level, including shipping, breaking waves, marine life, and other human-made and natural sounds.

The oceans are generally even noisier in coastal waters where many natural and human-made sounds exist. Coastal waters present a complex environment of varying depths, coastal boundaries, tides and currents, weather patterns, and significant biological and commercial activities.

Coastal waters contain 80 percent of all ocean life and support many human activities, including commercial shipping ports, fishing fleets, and oil exploration and drilling. These activities bring significant noise to the coastal environment, which when combined with complex oceanographic features, creates a difficult and varied environment for sonar technicians to operate within. However, such a complex environment is typically where most nations' submarines operate today.



**What is Sonar?** The use of the term *sonar*, defined as **SO**und **NA**avigation and **R**anging, was coined in 1942 by F.V. Ted Hunt, director of the Harvard Underwater Sound Laboratory. Sonar technology uses sound energy waves to detect and locate submerged objects, such as submarines and mines.

There are two types of sonar:

**Passive sonar** is a sound-receiving system that “listens” for sound waves generated by human-made or biological sources using underwater microphones that receive, amplify and process underwater sounds. It does not put any sound energy in the water. Passive sonar can indicate the presence, character and movement of submarines if submarines are noisy or

operating at high speeds. Passive sonar can be ineffective in detecting quiet submarines operating in areas where background noise levels are elevated, such as coastal waters. Although improvements in passive sonar are continually being researched, passive sonar currently does not provide the detection capabilities of active sonar against a quiet modern diesel-electric submarine.

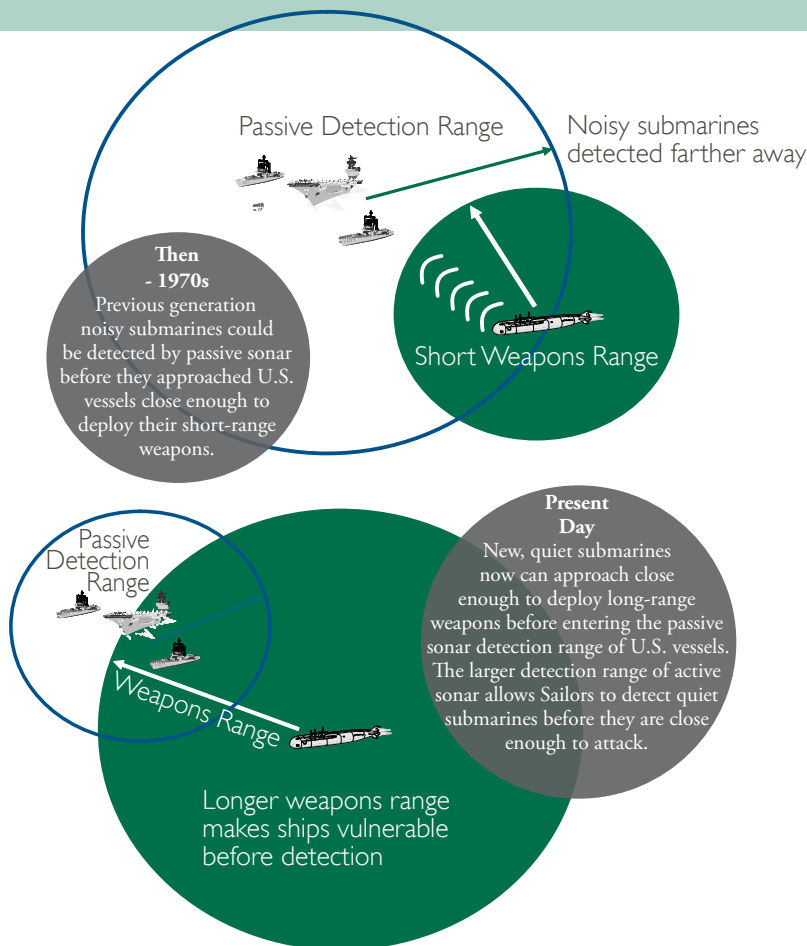
**Active sonar** can be the most effective means available for locating objects underwater. It is based on the principle of "echo ranging." Active sonar sends out a pulse of energy, often called a “ping,” that travels through water, reflects off objects and returns to a receiver on the ship. Skilled technicians can use the

reflected sonar pulse to determine the range, distance and movement of an object. Common active sonars include fish finders, echo sounders, side scan sonars and military sonars.

Active sonar has the ability to locate objects that are too quiet to be detected using passive sonar technology. This makes active sonar invaluable for detecting the new breed of very quiet submarines. Active sonar is also effective at locating underwater mines. Although active sonar is the most effective way to detect objects, Navy vessels use active sonar sparingly because sonar can reveal the sending vessel’s location.



**The Navy will be requesting reauthorization of its five-year Marine Mammal Protection Act permit. In addition, the Navy will engage in required Endangered Species Act consultations.**



**Sonar: Then and Now.** In response to Allied shipping losses from U-boat attacks during World War I, the Navy began using sonar to locate submerged objects. Today sonar is used not only to identify, track and target submarines, but also to determine water depth and locate underwater mines. With advances in warfare technology, new diesel-powered submarines operating on batteries and air independent propulsion systems are extremely quiet and hard to detect in the noisy ocean environment. These modern submarines are relatively inexpensive and used by many nations around the world, posing a challenge for the Navy to locate, identify and track them.

**The Navy needs to use active sonar for training and testing purposes even during peacetime to develop and maintain the complex skills needed to effectively detect and counter these quiet submarines.**

