

Purpose and Need

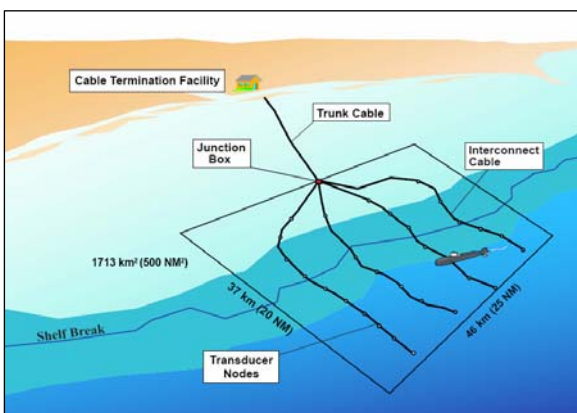


What is the Undersea Warfare Training Range (USWTR)?

The USWTR is an offshore instrumented training range that would allow the Navy to track the movement of submarines, surface ships, and aircraft during training. It is an important requirement for the Navy's Atlantic Fleet anti-submarine warfare (ASW) training. The range would be approximately 500 square-nautical-miles (NM²) in area and located in ocean water depths ranging from approximately 120 to 900 feet. The USWTR would:

- Replicate potential threat areas to provide a realistic training environment.
- Provide real time training data for analysis and immediate exercise feedback.
- Increase ASW training effectiveness.

The USWTR instrumentation is a system of offshore underwater acoustic transducer devices, called nodes. The nodes are connected to one another by cables, and the offshore range is connected by a trunk cable to a small building, located onshore, called the cable termination facility (CTF). These transducer nodes are capable of both transmitting and receiving acoustic signals from ships operating within the USWTR, which allows the position of the participants to be determined and stored electronically for both real-time and future training evaluation.



Why does the Navy need the USWTR?

There is a growing threat today from increased numbers of submarines, particularly ultra-quiet diesel submarines, among non-democratic nations of the world. This global threat is progressively more menacing to the Navy's ability to defend US interests worldwide, including both humanitarian and military missions. Military missions include delivering fighting forces, equipment, and supplies overseas.

Diesel submarines are exceptionally quiet and can stay submerged for extended time periods. Anti-submarine warfare training is a perishable skill, and Navy personnel must train with active sonars in realistic training environments similar to those used by adversaries to respond effectively in real-world situations. Littoral (near-land) shallow water areas are particularly important in modern warfare, because they are often confined and congested, allowing enemy submarine forces to easily conceal themselves.

The way in which the proposed USWTR directly contributes to the Navy's ability to fulfill its mission is by providing an environment that is consistent with real-world threat situations and where training can be conducted under safe and controlled conditions. The instrumented range provides feedback that is needed to confirm training effectiveness.

Realistic training is Navy's single greatest need to prepare and protect its sailors. Therefore, the USWTR is needed so the Atlantic Fleet can more effectively train in a realistic environment. The proposed USWTR provides realistic training in an environment that is similar to strategically important littoral areas.

Why is active sonar required for anti-submarine warfare training?

When hunting for submarines, naval forces use many tools. Because sound travels through water much more easily than light or radio waves, the use of sound (acoustics) is essential.

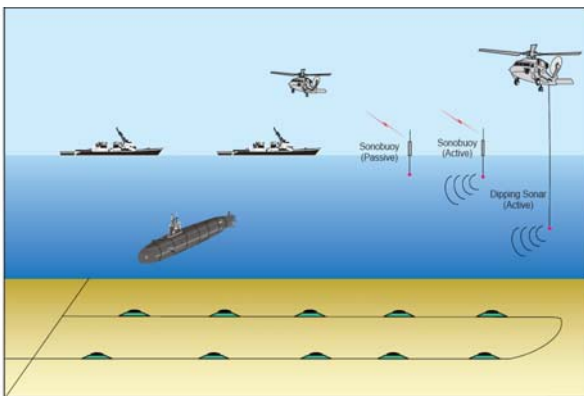
The Navy's acoustic tool is called sonar (sound navigation and ranging). There are two categories of sonar: passive and active. Passive sonar is a listening tool. Active sonar emits sound energy into the water, and a submarine is detected when this energy bounces off the hull of a ship and is then processed by a receiver.

The usefulness of passive sonar has diminished significantly as submarine technology evolves and submarines become quieter. Submarines built today are on average more than one hundred times quieter than those operated by the former Soviet Union in the 1960s. Active sonar may be the only practical method of detection for many submarine targets under many environmental conditions.

What does the training involve?

Submarines, surface ships, and aircraft (individually or as a coordinated force) practice ASW against submarine targets, including both actual submarines and other mobile targets that simulate the operations of an actual submarine.

In order to represent threats as realistically as possible, a variety of sensors (mainly mid-frequency sonar), non-explosive training weapons, target submarine simulators, and other associated hardware will be used. Many of the materials used on the USWTR would be recovered after use; however, some would be left in place. All materials used would be non-explosive.



ASW exercises are complex and highly variable. They have been grouped into four representative scenarios, summarized below:

- **Scenario 1: One Aircraft vs. One Submarine.** An aircraft is given the approximate or "last known" location of a submarine. The aircraft flies over the range area and the crew conducts a localized

search for the target submarine using available sensors. After the crew detects the submarine, it carries out a mock attack. Each exercise typically involves firing one training torpedo, with additional attack phases utilizing simulated torpedo firings.

- **Scenario 2: One Ship with Helicopter vs. One Submarine.** A ship with a helicopter aboard approaches the range area and launches its helicopter to conduct a "stand-off" localization and attack against a submarine. Next, the ship conducts its own "close in" attack simulation. An exercise period typically involves firing one training torpedo by the ship or the helicopter or both. Only one helicopter participates in the exercise at any one time. While the ship is searching for the submarine, the submarine may practice simulated attacks against the ship and would launch torpedoes during approximately 50% of all exercises.
- **Scenario 3: One Submarine vs. Another Submarine.** Two submarines practice locating and attacking each other. If only one submarine is available, it practices attacks against a target that simulates a submarine or small boat, or it practices shallow water maneuvers without any attack simulation.
- **Scenario 4: Two Ships and Two Helicopters vs. One Submarine.** This scenario involves the same action as Scenario 2, but with two ships and two helicopters versus one submarine. One ship and helicopter are typically engaged while the other ship and helicopter are repositioning. While the ships are searching, the submarine may practice simulated attacks, launching training torpedoes during approximately 50 percent of the exercises. Operationally, Scenario 4 is the range's busiest event, with potentially multiple sources of sonar active at one time.

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