

At a Glance

What is it?

- The Maritime Weapons of Mass Destruction (WMD) Detection Program explores technologies for tracking, detecting, determining intent, intercepting, deciding on operational options, identifying, engaging, and neutralizing WMD in the maritime domain.
- The program provides maritime domain awareness functions related to special nuclear materials (SNMs) from surface or subsurface vessels.

How does it work?

- WMD detection technologies allow a vessel to detect SNMs in an operational mode while on a surveillance mission.
- Detection schemes range in timeframe and may function from above and below the water line.

What will it accomplish?

- The WMD Program goal is to provide solutions that will ensure the safer transport of shipments from foreign ports to the United States without the threat of SNM-based weapons.
- Capable of long-range open ocean transit, these detection systems will oversee at-sea cargo transfers in various sea states and may even permit the high-speed transit of sensor systems between various ports.

Point of Contact

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The Office of Naval Research (ONR) is developing technologies for detecting SNMs in a maritime environment. In the past, high-clutter environments and low-resolution detectors have both limited the typical detection range. Development of higher resolution detectors and innovative sensors based on electronic micro- and electromechanical systems could extend the current detection ranges. Additionally, development of higher resolution detectors, innovative sensors, active interrogation systems and approaches for deployment will significantly extend remote standoff detection capabilities.

ONR, the Department of Homeland Security, and the Defense Threat Reduction Agency are working to deliver higher performance systems for naval applications starting in 2011 with a near-term focus on underwater applications. The Naval Research Laboratory, naval warfare centers and others are developing new standoff detection capabilities. The Weapons of Mass Destruction Detection Program will further the design and development of specific longer range detectors that will be tested in large-scale shipboard experiments between 2015 and 2020.

The program consists of multiple technology challenges, all of which are necessary to achieve the long-range counter-WMD vision. Through research partnerships, ONR is formulating multi-mode sensing systems to allow future Navy ships to detect and classify the potential of threats at long ranges, reducing the need for boarding parties and stopping shipping for lengthy searches.

ONR is investigating various active and passive detectors for SNMs as possible sensors and for use in underwater unmanned vehicles. ONR is also studying variable geometry interrogators and airborne sensors to enable detection with little or no need to stop questionable vessels. These systems would require a smaller or minimal crew and maintenance examination from networked shore repair facilities.

The WMD program will deliver to the warfighter an enhanced ability to obtain more accurate sensing of WMD before a warfighter has to set foot on a suspect vessel. This will increase the surveillance capabilities over systems currently available.

Research Challenges and Opportunities:

- Remote standoff detection of special nuclear materials
- Underwater radiation detectors (RSOD/SWM)
- Active interrogation devices
- Modeling and simulation

