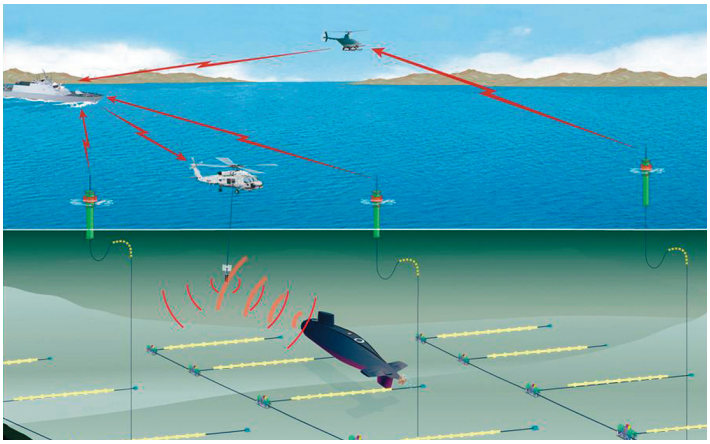
Advanced Deployable System (ADS)

Executive Summary

- The Navy demonstrated Advanced Deployable System (ADS) acoustic arrays and processing subsystems during a large Pacific Fleet Anti-Submarine Warfare (ASW) exercise against threat representative diesel-electric submarines. Although the sensors and processor performance could meet objectives, the program is still developing the Tactical Interface, Installation Support, and Buoy Subsystems.
- The survivability of the Array and Buoy Subsystem in the littoral environment, and the communications bandwidth and energy requirements for the system are risk areas.
- The ADS Test and Evaluation Master Plan was approved to support Milestone B.



System

ADS is a rapidly deployable, bottom mounted, acoustic undersea surveillance system to detect and track threat submarines in littoral waters. The system includes:

- Passive sonar array strings linked to an interface buoy for acoustic data pre-processing and radio frequency transmission to processors and operators aboard Littoral Combat Ship (LCS)
- Array handling equipment and onboard processing equipment included in the ASW mission package for the LCS

Mission

The Anti-Submarine Warfare Commander uses a LCS equipped with ADS in order to provide an ocean choke-point barrier or area distributed undersea acoustic surveillance system for detecting submarines.

- Capable of detecting nuclear and advanced diesel electric submarines in support of the ASW mission
- Can be installed, deactivated, and reactivated as needed to support coordinated ASW operations

Activity

- During October–November 2004, the Navy installed ADS arrays, as a technology demonstration, in a large Pacific Fleet ASW exercise, TASWEX-04. While not fully representative of the system envisioned for the LCS, TASWEX-04 was an excellent opportunity to test the acoustic arrays and processing subsystems against threat representative diesel electric submarines and to evaluate many of the operational and connectivity concepts.
- Other developmental tests demonstrated a small Dispenser Transport Vehicle designed to deploy the ADS arrays from a surface ship and radio transmission of ADS acoustic data to a ship.

Assessment

While TASWEX-04 was not conducted as an operational test, the resultant performance and realism indicates that the objectives of the ADS program acoustic sensors could be met. The connectivity with surface and air ASW forces was satisfactory. The higher risk areas of ADS program are still in initial development and could not be demonstrated during TASWEX-04. Risk areas include:

- Development of the Installation Support Subsystem and the Dispenser Transport Vehicle for the LCS.
- Development of the Tactical Interface Subsystem for radio frequency transmission of acoustic array data, and power for the buoy radio and processor systems.
- Bandwidth and energy requirements to transmit and process acoustic data to processors in the LCS Tactical Interface Subsystem.
- Development of ADS operations and support software to be used on a common architecture aboard LCS. Current ADS operations are manpower intense and require experienced operators on multiple work stations.
- Survivability of the in-water portions of the system (arrays, inter-node cabling, array installation modules, and interface buoy) in a littoral environment. Fishing, merchant traffic, and other activity place these systems at risk.

Recommendations

1. The Navy should complete the Coordinated ASW Concept of Operations defining how and where ADS will support ASW forces.

2. The following steps are designed to maximize the probability of a successful ADS operational test with the LCS ASW mission package, and should be observed by operational testers:
   - Complete realistic testing of the Tactical Interface, Installation Support, and Buoy subsystems.
   - Conduct early interoperability tests of the LCS Tactical Interface Subsystem.
   - The LCS and ADS program offices should give high priority to the resolution of any ADS/LCS interface issues.