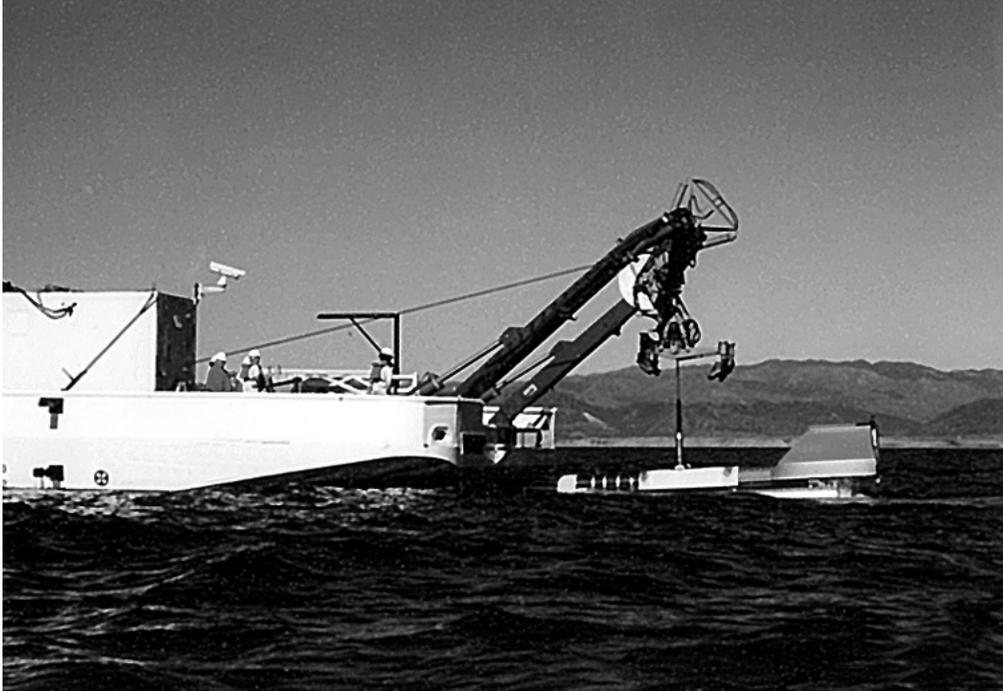


FIXED DISTRIBUTED SYSTEM (FDS) AND ADVANCED DEPLOYABLE SYSTEM (ADS)



Navy ACAT II Programs

Total Number of Systems:	1 FDS, 9 ADS
Total Program Cost (TY\$):	FDS-\$1095.7M ADS-\$1370.7M
Average Unit Cost (TY\$):	FDS-\$1095.7M ADS-\$46.1M
Full-rate production:	ADS-FY05

Prime Contractor

Raytheon and Lockheed Martin

SYSTEM DESCRIPTIONS & CONTRIBUTIONS TO JOINT VISION 2020

The Fixed Distributed System (FDS) is an ocean surveillance system that employs seabed acoustic sensors distributed over large ocean areas to detect, classify, localize, and track submarine contacts in selected areas of the world. The Advanced Deployable System (ADS) is a littoral water deployable undersea surveillance system designed to provide the Joint Force Commander with a timely and reliable picture of undersea activity. Both of these systems contribute to ***Joint Vision 2020 full-dimensional protection*** through ***information superiority***. FDS consists of two sub-systems: an Underwater Segment (UWS) and a Shore Signal Information Processing Segment. FDS was designed to augment the existing Sound Ocean Surveillance System and be compatible with the Integrated Undersea Surveillance System, including Surveillance Towed Array Sensor System ships. Similarly, ADS consists of an Under Water Segment, a Processing and Analysis Segment, and a Mission Support Segment.

BACKGROUND INFORMATION

Engineering development of FDS commenced in 1989. An initial seabed sub-system for the first FDS was installed and became the test article for OT. Initial operation of this system occurred in 1995. Plans had called for procurement of 11 operational systems through 2006. However, the Navy truncated the program and limited procurement to the engineering development model for the first full field, an additional FDS system, and training equipment. The additional system supported the demonstration of a rapidly deployable variant, FDS-D (deployable) in 1994. The FDS-D experiment proved the deployment and retrieval concepts and successfully demonstrated the FDS acoustic detection and tracking concepts with submarine targets using Navy operators. The FDS-D experiment led to the signing of the ADS ORD in 1994. The TEMP was drafted and development proceeded.

After the entire system FDS-1 was installed and operating and the initial Surveillance Direction System software (SDS) was installed, an OA of FDS (OT-IID / SDS OT-I) was conducted at the FDS-1 site in September 1996. SDS is the command and control component that interfaces the FDS with the Integrated Undersea Surveillance System. This OA was conducted in lieu of an OPEVAL due to the cancellation of FDS Milestone III in 1994.

COMOPTEVFOR found FDS potentially operationally effective and potentially operationally suitable but noted some problems in the areas of tactical support and survivability. FDS achieved Full Operational Capability in September 1996. Due to the cancellation of OPEVAL and Milestone III, testing in accordance with the FDS TEMP 1009 Rev. 2.3 has been essentially completed.

Initial system-level testing of ADS was conducted in March 1998 in an Integrated Article Test designated OT-IA. The test configuration consisted of two complete nodes of the system deployed in shallow water. The objectives included exercising the emplacement procedures and calibrating the in water segment as to location, orientation, and straightness. The arrays were deployed by a craft of opportunity. The Processing and Analysis Segment was installed in shore-based vans. The full system was exercised using the current software build and included classification and target tracking of real targets and a towed projector.

Using the Integrated Article Test results, modeling and simulation reviews, and other development tests dating back to 1996, COMOPTEVFOR completed an Early Operational Assessment of ADS in June 1998. The COOP variant of ADS was assessed to be potentially operationally effective. Potential operational suitability could not be determined due to system immaturity. Four significant areas of risk were identified by this Early Operational Assessment: Deployment Time, Joint Interoperability, Interoperability, and Tactics.

An Operational Assessment (OT-IB) was conducted on the ADS system over a 60-day Fleet Exercise Test (FET), in conjunction with various U.S. Third Fleet sponsored exercises between March-May 1999. In support of this OA, an installation of ADS was deployed offshore in a fleet operating area. ADS was tested using a DOT&E approved test plan as a combined DT/OT that included a one week Limited Objective Exercise (LOE-99) conducted as a phase of Fleet Battle Experiment ECHO, a one week Amphibious Readiness Group Exercise (Kernel Blitz-Prime), and a one week Carrier Battle Group Exercise. These exercises provided scenarios to examine the value of ADS deployed in shallow waters to support joint operations in littoral areas. DOT&E observed this test, which included four submarines, (one SSBN, two SSNs and one diesel electric) and multiple surface vessels as targets for ADS. Navy personnel were trained and used as operators. The background noise conditions imposed by coastal traffic and fleet naval vessels were severe during this test but representative of the expected operational

environment. The Craft of Opportunity variant of ADS was assessed to be potentially operationally effective and potentially operationally suitable. Three significant areas of risk were identified by this OA: underwater segment survivability, interoperability, and training.

TEST & EVALUATION ACTIVITY

The ADS ORD was signed in December 1999. An ORD clarification letter outlining plans for incremental development of ADS was provided by the program sponsor, Director, Submarine Warfare, in July 2000. These documents reflect important changes in ADS, including additional configurations and deployment methods. Throughout the year DOT&E participated in a series of TEMP and concept of operations working groups and program reviews. The first draft of a revised TEMP is nearing completion.

In September 2000 DOT&E observed OT-1C, an operational test of one of the deployment options for the ADS. Specific information on the purpose and objectives of OT-1C is contained in the classified annex to this report. ADS OPEVAL is planned for FY04.

TEST & EVALUATION ASSESSMENT

COMOPTEVFOR completed the final report for OT-1B in December 1999. Performance of the ADS system during the LOE-99 was disappointing. ADS did not generate enough target information that was recognized by the operators and the C⁴I systems provided to report the information did not perform as required. Subsequent analyses of the recorded acoustic data has shown that, in many cases, target information was present and detectable on ADS despite the high background noise levels, even though not detected/recognized by the operators. This was primarily due to insufficient operator training with actual ADS equipment. As a result, the ASW commander did not receive the target queuing information needed to protect the fleet units from submarines in LOE-99. However, the performance of the operators improved markedly for the subsequent Kernel Blitz-Prime and carrier battle group exercises, largely due to the learning experience provided by the earlier test.

DOT&E approved the OT-1C test plan. While the deployment method was physically demonstrated, several technical problems impacted the schedule and ability to assess detection capability. COMOPTEVFOR is analyzing data collected from this DT/OT event and will submit an operational assessment in January 2001.

CONCLUSIONS, RECOMMENDATIONS AND LESSONS LEARNED

The ADS program has some difficult technical challenges to overcome in 2001. The performance requirements of the new ORD are more demanding and are being incorporated in the revised TEMP. The program must correct the deficiencies revealed in OT-1B in the areas of C⁴I and the concept of operations and any additional deficiencies that may come out of OT-1C. The primary risk area in the ADS program is, however, cable survivability and its impact upon attaining the operational availability threshold specified in the ORD. New cable survivability information learned during FET and other testing requires the ADS program office to develop additional measures to mitigate this risk.

