

AN/WLD-1(V)1 Remote Mine-hunting System (RMS)

Executive Summary

- Of the six DDG 51 Flight IIA class ships originally outfitted to host the Remote Mine-hunting System (RMS), only one ship retains this capability.
- The Navy attempted to complete IOT&E of the RMS in June 2007. As a result of reliability problems, the RMS program manager decertified the system after six days of testing.
- The DDG 51 host ship departed in August 2007 on a six-month deployment. The Navy elected to retain RMS aboard the host ship, but issued guidance prohibiting operational employment of the system. IOT&E has not yet been rescheduled.
- A modified version of the RMS is planned for use on Littoral Combat Ships (LCS) as part of the mine warfare mission package.

System

- RMS is a naval mine detection system.
- RMS includes an unmanned, diesel-powered, semi-submersible vehicle called the Remote Mine-hunting Vehicle (RMV). The RMV tows an AN/AQS-20A variable depth sonar mine sensing subsystem.
- The Navy launches and remotely controls the RMV from a DDG 51 Flight IIA class ship outfitted with a launch and recovery subsystem. Although the Navy originally outfitted six ships to host the RMS, only one ship retains this capability. The Navy also plans to use the RMV on LCS as part of the mine warfare mission package.
- A data link subsystem provides continuous, real-time communications between the host ship and the RMV for command and control and transmission of sensor data.
- Missions are planned and controlled and data is processed, displayed, and recorded using a remote mine-hunting



functional segment integrated into the DDG 51 combat system.

Mission

- The host platform Commanding Officer can employ RMS to detect, classify, and identify moored and bottom mines in shallow and deep water, allowing Naval forces to determine whether potential sea routes and operating areas contain mines.
- The Maritime Force Commander can use the organic or “in-stride” mine countermeasures capability of an RMS-equipped ship to make mine avoidance decisions without waiting for dedicated mine countermeasures ships or helicopters.

Activity

- DOT&E approved a revised Test and Evaluation Master Plan (TEMP) and the IOT&E test plan in May 2007. Both documents supported planned IOT&E in June 2007.
- The Navy attempted to complete IOT&E of the RMS in June 2007 on the remaining DDG 51 host ship using the first low-rate initial production (LRIP) RMV. However, as a result of RMV reliability problems, the RMS program manager withdrew certification of the system for operational test after six days of testing.
- The DDG 51 host ship departed in August 2007 on a six-month deployment. The Navy elected to retain RMS aboard the host ship for training and further testing, but issued guidance prohibiting operational employment of the system.

- The Navy has not yet rescheduled the IOT&E because of the challenging schedule of the host ship in 2008. The ship is scheduled for a second deployment within seven months of returning from the current deployment; other activities in preparation for deployment will limit the opportunity for RMS testing.

Assessment

- Although an operational assessment conducted in FY06 demonstrated improved reliability and operational availability for the RMV Engineering Development Model (EDM), the first LRIP RMV exhibited reliability problems during FY07 IOT&E, leading to early termination of the test. RMS

operational availability was not satisfactorily demonstrated under shipboard conditions.

- Overall, the available IOT&E test data is insufficient to fully characterize RMS detection performance. The FY06 operational assessment and the limited test data from IOT&E indicate that the RMS, when operated by a proficient crew, may effectively detect and classify moored mines in deep water. The data also indicates potentially acceptable detection performance in shallower minefields, containing both moored and bottom mines, when the bottom is smooth and the clutter density is low. Detection performance under other conditions has been lower than planning model predictions; it is not yet clear whether the system will meet performance objectives in challenging environments.
- The RMS false classification density (number of non-mine-like objects erroneously classified as mine-like per unit area searched) has generally been above the limits established for the sensor system (AN/AQS-20A). A large number of false targets may limit the system's usefulness to the operational commander.
- A number of capabilities remain high risk based on the limited test results to this point. These include operational suitability, shallow water performance, and the system's ability to reacquire a previously detected object and positively identify it as a mine or non-mine.
- Radiated noise measurements collected during developmental testing indicate that the LRIP RMV will be vulnerable to some

mines. RMV configuration changes will be required to reduce the RMV acoustic signature.

- Although the Operational Requirements Document states that RMS will be operated from select DDG 51 class ships as well as the LCS, the Navy intends to make the LCS the primary host for RMS. DOT&E is working with the Navy to ensure future testing on the LCS is adequate to fully evaluate effectiveness and suitability.

Recommendations

- Status of Previous Recommendations. The Navy took action on two of the three FY06 DOT&E recommendations. The Navy only partially addressed the recommendation that they clarify the Operational Requirements Document to state the condition under which achieved search level and achieved search rate are to be measured. The Navy did add values for false classification density to the TEMP based on AN/AQS-20A performance requirements.
- FY07 Recommendations. The Navy should:
 1. Schedule and complete IOT&E of RMS prior to a full-rate production decision on RMS or on RMVs. Conduct sufficient developmental test events prior to the IOT&E to gain confidence in system performance.
 2. Ensure future operational testing of the revised system on the LCS is adequate to fully evaluate effectiveness and suitability.