Surveillance Towed Array Sensor System (SURTASS) and Compact Low Frequency Active (CLFA) Sonar

Executive Summary

- The Commander, Operational Test and Evaluation Force completed IOT&E on Surveillance Towed Array Sensor System (SURTASS) and Compact Low Frequency Active (CLFA) Sonar in January 2016. Testing was conducted in accordance with a DOT&E-approved test plan.
- DOT&E submitted an IOT&E report for SURTASS/CLFA in January 2015. It concluded that SURTASS/CLFA was not operationally effective for wartime Anti-Submarine Warfare (ASW) and that SURTASS/CLFA has significant cybersecurity vulnerabilities. SURTASS/CLFA was operationally suitable.

System

- SURTASS/CLFA is a low-frequency, passive and active, acoustic surveillance system installed on *Victorious* class tactical auxiliary general ocean surveillance (T-AGOS) ships as a component of the Integrated Undersea Surveillance System.
- SURTASS provides passive detection of nuclear and diesel submarines and enables real-time reporting of surveillance information to ASW commanders.
- CLFA is a low-frequency, active sonar system developed to provide an active detection capability of quiet submarines operating in environments that support long-range propagation.
- The system consists of:
  - A T-AGOS host ship with array-handling equipment
  - A towed vertical string of active acoustic projectors
  - A towed horizontal twin line (TL-29A) passive sonar array
  - An Integrated Common Processor for processing active and passive acoustic data
  - A High-Frequency Marine-Mammal Monitoring active sonar used to ensure local water space is free of marine mammals prior to and during low-frequency active transmission
  - A communications segment to provide connectivity to shore-based Integrated Undersea Surveillance System processing facilities and to fleet ASW commanders

Mission

Maritime Component Commanders:

- Employ *Victorious* class T-AGOS ships equipped with SURTASS/CLFA systems to provide long-range active and passive ASW detection, classification, and tracking of submarines in support of Carrier Strike Group and theater ASW operations.
- Use SURTASS/CLFA to provide blue force ASW screening and threat submarine localization information to theater ASW commanders to support coordinated prosecution of detected threat submarines.

Major Contractors

- Integrated Common Processor: Lockheed Martin – Manassas, Virginia
- CLFA Projectors: BAE – Nashua, New Hampshire
- TL-29A Towed Arrays: Lockheed Martin – Syracuse, New York

Activity

- In January 2015, the Commander, Operational Test and Evaluation Force completed IOT&E for SURTASS/CLFA. Testing was conducted in accordance with a DOT&E-approved test plan and included:
  - ASW area search operations that supported coordinated theater ASW during fleet exercises Valiant Shield 12 and Valiant Shield 14
  - Dedicated, at sea test phases in 2012 and 2014 that obtained performance data necessary to characterize detection capability against long-range submarine approaches
  - A cybersecurity assessment in January 2015

- In January 2016, DOT&E submitted a classified IOT&E report for SURTASS/CLFA based on observations and data collected during operational testing.
- One engineering development model and two production CLFA systems were available for operation on three of the four Western Pacific-based *Victorious* class T-AGOS ships during FY15.

Assessment

- The DOT&E classified IOT&E report concluded the following:
  - Testing was adequate to assess operational effectiveness and suitability.
  - SURTASS/CLFA was not operationally effective for wartime ASW. The fleet did not demonstrate sufficient capability to correlate non-submarine CLFA detections that were reported as possible submarines to real-time surface ship positions. Failure to exclude surface ship detections, coupled with limited numbers of available ASW-capable assets, will not support fleet prosecution of CLFA submarine localizations. Further details of the observed deficiencies are available in the classified report.
  - Although not the primary focus of this limited operational testing, SURTASS/CLFA can support coordinated ASW during peacetime. Long-range active detection and localization capability exceeds that of all non-SURTASS platforms. Without the risk of imminent attack, SURTASS/CLFA limitations can likely be overcome through extended analysis and comprehensive integration of other ASW platform and sensor data.
  - SURTASS/CLFA is operationally suitable, but exhibits reliability deficiencies during system initialization. Subsequent to a successful start-up of both the passive and active sonar arrays, SURTASS/CLFA demonstrated that it can operate without failure for extended and operationally relevant periods of time.
  - Cybersecurity evaluation identified significant problems, which are classified.

Recommendations

- Status of Previous Recommendations. The Navy should continue to address the FY13 recommendation to improve procedures and training for correlating CLFA non-submarine, active detections with real-time surface vessel positions.
- FY15 Recommendations. The Navy should:
  1. Mitigate identified cybersecurity vulnerabilities as soon as feasible for deployed SURTASS/CLFA and incorporate long-term corrections within future increments of SURTASS/CLFA.
  2. Address reliability failure modes observed during operational testing.
  3. Address the seven classified recommendations listed in the January 2016 IOT&E report.