Surface Ship Torpedo Defense (SSTD) System: Torpedo Warning System (TWS) and Countermeasure Anti-Torpedo (CAT)

Executive Summary

- In April 2018, DOT&E submitted a third update to the 2015 Early Fielding Report on the Surface Ship Torpedo Defense (SSTD) system. The classified update provides an assessment based on a Quick Reaction Assessment (QRA) conducted by the Navy Operational Test and Evaluation Force (OPTEVFOR) and system-level contractor testing. Insufficient data were available to assess operational effectiveness and operational suitability; however, significant observations include:
  - Qualified sailors with the support of contractors used the Torpedo Warning System (TWS) to successfully alert on inbound torpedoes.
  - Countermeasure Anti-Torpedo (CAT) demonstrated some capability to defeat an incoming torpedo.
  - Towed Active Acoustic Source (TAAS) reliability is improved.
  - CAT reliability is uncertain.
- In September 2018, the Navy suspended its effort to develop the SSTD system. The Navy plans to restore all carriers to their normal configurations during maintenance availabilities between FY19 and FY23. DOT&E removed the SSTD system from DOT&E oversight.
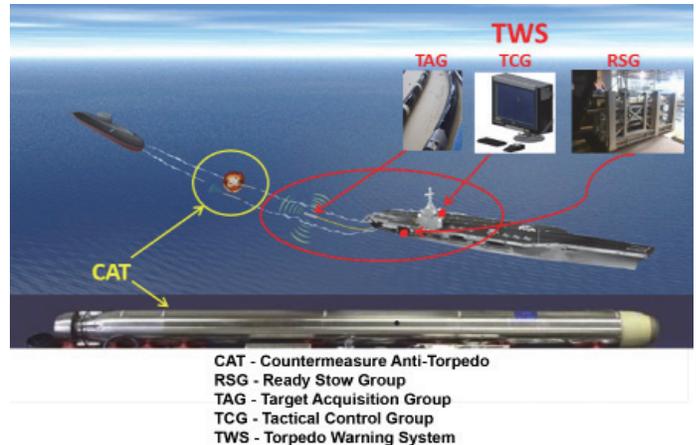
System

- SSTD is a system of systems that includes TWS and CAT. Combined, TWS and CAT are referred to as the Anti-Torpedo Torpedo Defensive System (ATTDS).
- TWS is being built as an early warning system to detect, localize, classify, and alert on incoming threat torpedoes.
- CAT is a hard-kill countermeasure intended to neutralize threat torpedoes.

Mission

Commanders of nuclear-powered aircraft carriers and Combat Logistic Force ships will use the SSTD system to defend against incoming threat torpedoes.

CAT - Countermeasure Anti-Torpedo
RSG - Ready Stow Group
TAG - Target Acquisition Group
TCG - Tactical Control Group
TWS - Torpedo Warning System

Major Contractors

TWS
- Ultra Electronics 3 Phoenix (Prime Contractor) – Chantilly, Virginia, and Wake Forest, North Carolina
- Alion Science and Technology (Acoustics and testing consultant) – New London, Connecticut
- In-Depth Engineering (Tactical Control Group software development) – Fairfax, Virginia
- Pacific Engineering Inc. (Ready Stow Group manufacture) – Lincoln, Nebraska
- Rolls-Royce (Winch manufacture) – Ontario, Canada
- Teledyne (Towed Array manufacture and assembly) – Houston, Texas

CAT
- Pennsylvania State University Applied Research Laboratory (ATT Systems) – State College, Pennsylvania
- Pacific Engineering Inc. (Canister fabrication) – Lincoln, Nebraska
- SeaCorp (All Up Round Equipment fabrication and assembly) – Middletown, Rhode Island

Activity

- In October 2017, OPTEVFOR conducted a third QRA in conjunction with system-level contractor testing. Because of reliability problems with test target surrogates, test equipment, and CAT hardware, the Navy did not execute the test scenarios per the contractor test plans or the DOT&E-approved test plans. The Navy completed two salvo events (a salvo is two torpedoes launched near simultaneously at the test ship) and one single incoming torpedo event during the QRA. The contractor completed five TWS detection events and one salvo event.

- In April 2018, DOT&E issued a classified update to the Early Fielding Report. This update includes analysis of data collected during the October 2017 QRA and contractor testing.
- In September 2018, the Navy suspended its efforts to develop the SSTD system. The Navy plans to restore all carriers to their normal configurations during maintenance availabilities between FY19 and FY23. DOT&E removed the SSTD system from DOT&E oversight.

Assessment

The April 2018 QRA and contractor testing demonstrated that the TWS and CAT contractors made progress towards developing capability that meets the systems operational requirements. The DOT&E classified update provides detailed analysis. Significant observations include:

- Test data were insufficient to assess operational effectiveness and operational suitability of TWS and CAT.

- Operators with contractor support used TWS to successfully alert on inbound torpedoes during simple and structured scenarios. However, additional data are required to characterize capability within the envelope of relevant environments, operating profiles of the supported platforms, and employment tactics of threat torpedoes.
- TWS demonstrated some capability to detect incoming torpedoes. The significance and effect of false target alerts on TWS capability are unknown.
- CAT demonstrated some capability to defeat an incoming torpedo.
- CAT has uncertain reliability.
- The lethality of CAT is untested.

Recommendations

None.