AN/SQQ-89A(V)15 Integrated Undersea Warfare (USW) Combat System Suite

Executive Summary
- The Navy deployed the AN/SQQ-89A(V)15 with Advanced Capability Build (ACB)-11 onboard a DDG 51 class destroyer in July 2013.
- The Navy Commander, Operational Test and Evaluation Force (COTF) conducted an operational assessment (OA) of the AN/SQQ-89A(V)15 in conjunction with two fleet training events in FY13. AN/SQQ-89A(V)15 demonstrated capability to detect submarines and incoming U.S. torpedoes during limited deep water testing.
- IOT&E is expected to complete in 3QFY14.

System
- AN/SQQ-89A(V)15 is the primary Undersea Warfare system used aboard U.S. Navy surface combatants to locate and engage threat submarines. AN/SQQ-89A(V)15 is an open-architecture system that includes biannual software upgrades (ACBs) and four-year hardware upgrades called Technology Insertions.
- AN/SQQ-89A(V)15 uses active and passive sonar to conduct Anti-Submarine Warfare (ASW) search. Received acoustic energy is processed and displayed to support operator detection, classification, localization, and tracking of threat submarines.
- AN/SQQ-89A(V)15 uses passive sonar to provide early warning of threat torpedoes.
- The Navy intends for the program to provide improvement in sensor display integration and automation, reduction in false alerts, and improvement in onboard training capability to better support operation within littoral regions against multiple sub-surface threats.
- The system consists of:
  - Acoustic sensors – hull-mounted array, multi-function towed array (TB-37), towed acoustic intercept array, calibrated reference hydrophone, helicopter and/or ship-deployed sonobuoys
  - Functional segments used for processing and display of active, passive, and environmental data

Consoles MH-60R SQS-53C/HMA TB-37/MFTA

HMA - Hull Mounted Array
MFTA - Multi-Function Towed Array

  - Interface to Aegis Combat System for Mk 46 and Mk 54 torpedo prosecution using surface vessel torpedo tubes, Vertical Launch Anti-Submarine Rocket, or SH-60B/MH-60R helicopters
- The system is deployed on a DDG 51 class destroyer or CG 47 class cruiser host platform.

Mission
- Maritime Component Commanders employ surface combatants with AN/SQQ-89A(V)15 as escorts to high-value units to protect against threat submarines during transit.
- Maritime Component Commanders use AN/SQQ-89A(V)15 to conduct area clearance and defense, barrier operations, and ASW support during amphibious assault.
- Unit Commanders use AN/SQQ-89A(V)15 to support self-protection against incoming threat torpedoes.

Major Contractor
Lockheed Martin Mission Systems and Training – Syracuse, New York

Activity
- AN/SQQ-89A(V)15 with ACB-09 was delivered to the fleet in FY09 and installed on 12 DDG 51 class destroyers. In 2011, the Navy deferred IOT&E of AN/SQQ-89A(V)15 with ACB-09 due to imminent delivery of ACB-11. The only previous operational test on a version of AN/SQQ-89A(V)15 occurred in 2005 and did not include an

evaluation of performance in shallow water. DOT&E placed AN/SQQ-89A(V)15 under oversight in late FY10.
- In January 2013, DOT&E sent a memorandum to the Assistant Secretary of the Navy (Research, Development, and Acquisition) outlining the need for a threat torpedo surrogate to support operational testing of the AN/SQQ-89A(V)15.

- COTF conducted an OA on AN/SQQ-89A(V)15 with ACB-11 in FY13. Test activities were conducted in accordance with a DOT&E-approved test plan and included ASW transit search and area search operations using AN/SQQ-89A(V)15 onboard a DDG 51 class destroyer. Testing was conducted in conjunction with the following two fleet events:
  - Submarine Command Course 12-4 Anti-Surface Warfare events in November 2012
  - Tactical Development Exercise 6-13 in April 2013
- COTF conducted integrated testing on AN/SQQ-89A(V)15 with ACB-11 in accordance with a DOT&E-approved test plan and in conjunction with a fleet training event, SCC 13-2, in May 2013.
- The Navy deployed a DDG 51 class destroyer with AN/SQQ-89A(V)15 with ACB-11 in July 2013.
- DOT&E will issue a classified Early Fielding Report for AN/SQQ-89A(V) with ACB-11 in 2QFY14 based on observations and data obtained from the OA and integrated testing.
- The Navy is scheduling dedicated IOT&E events for 2Q-3QFY14.

Assessment
- Operationally relevant testing of AN/SQQ-89A(V)15 with ACB-11 to date has been limited to deep water environments. Due to the prevalence of submarines operating in littoral regions, the lack of testing in shallow water represents risk to fleet operation.

- AN/SQQ-89A(V)15 with ACB-11 demonstrated capability to detect inbound U.S. torpedoes and will likely improve surface combatant survivability against sub-surface threats. The ability of surface combatants employing the AN/SQQ-89A(V)15 to avoid torpedoes can only partially be assessed due to significant differences in U.S. torpedoes and untested wake homing torpedoes employed by other nations.
- AN/SQQ-89A(V)15 with ACB-11 demonstrated some capability to detect and classify threat representative submarines during an OA. However, the limited testing was insufficient to assess the likelihood of a successful submarine prosecution.

Recommendations
- Status of Previous Recommendations. This is the first annual report for this program.
- FY13 Recommendations. The Navy should:
  1. Schedule and complete IOT&E to adequately assess the effectiveness and suitability of AN/SQQ-89A(V)15 with ACB-11 with a primary focus on performance in shallow water.
  2. Identify and/or develop a threat torpedo surrogate to support operational test as identified in a DOT&E memorandum to the Assistant Secretary of the Navy (Research, Development, and Acquisition) dated January 09, 2013.