AGM-88E Advanced Anti-Radiation Guided Missile (AARGM) Program

Executive Summary

- The Advanced Anti-Radiation Guided Missile (AARGM) program spent most of FY11 correcting hardware and software deficiencies discovered in developmental testing and during its first IOT&E attempt in 4QFY10 that ended with program decertification.
- Corrections of deficiencies discovered in FY10 were verified during developmental testing conducted between November 2010 and January 2011.
- An integrated developmental/operational test (IT) period was conducted between February and July 2011.
- The Operational Test Authority conducted an operational test readiness review in July 2011 and re-initiated dedicated IOT&E in August 2011.
- During FY11 IT and IOT&E, the Navy fired a total of four missiles at actual and simulated threat targets and emitters. As required by DOT&E, low-rate initial production (LRIP) missiles were used for all live-fire tests.
- As of September 2011, the Navy completed approximately 40 percent of planned operational test sorties, accumulating over 150 hours of missile operating time.
- IOT&E is scheduled to finish in the 2QFY12. Analysis of operational test events is ongoing with a corresponding beyond-LRIP report anticipated in 3QFY12.

System

- The AGM-88E AARGM is the follow-on to the AGM-88B/C/D High Speed Anti-Radiation Missile (HARM) using a modified HARM body and fins. AARGM is employed on F/A-18C/D/E/F/G platforms.
- The AARGM incorporates Millimeter Wave (MMW), GPS, and digital Anti-Radiation Homing (ARH) guidance, a Weapon Impact Assessment transmitter, and an Integrated Broadcast Service Receiver (IBS-R).
  - MMW technology allows enhanced target discrimination during terminal weapon guidance

  - ARH improvements over HARM include an increased field-of-view and larger frequency range
  - The GPS allows position accuracy in location, time, and weapon impact assessment transmissions
  - The IBS-R enables reception of national broadcast data

Mission

- Aircraft equipped with AARGM conduct pre-planned, on-call, and time-sensitive reactive anti-radiation targeting for the suppression, degradation, and destruction of radio frequency-enabled surface-to-air missile systems.
- AARGM provides commanders with real-time weapons impact assessment via a national broadcast data system.

Major Contractor

Alliant Techsystems, Defense Electronics Systems Division – Woodland Hills, California

Activity

- In 2QFY10, the Navy issued a change to the AARGM Capability Production Document (CPD) due to limitations discovered during the developmental test. This CPD change delayed the start of IOT&E to allow correction of system deficiencies, deferred a Key Performance Parameter target requirement to FOT&E, and clarified the acceptable target environment and reactive targeting constraints for IOT&E. These CPD changes enabled AARGM to first enter IOT&E in FY10.

- AARGM commenced IOT&E in June 2010, but during initial captive-carry flight tests, it suffered six operational mission failures. In September 2010, the Navy subsequently de-certified AARGM from IOT&E, and DOT&E rescinded approval for the program's operational test plan. As a condition for returning to IOT&E, DOT&E insisted the AARGM program conduct all future tests with LRIP missiles.

- The AARGM program spent most of FY11 correcting the hardware and software deficiencies discovered in developmental testing and during its first IOT&E attempt in FY10. The Navy successfully verified corrections of deficiencies during another developmental test phase conducted between November 2010 and January 2011.
- The Commander, Operational Test and Evaluation Force (COTF), in conjunction with the AARGM program office (PMA-242), conducted an IT phase from February to July 2011. Nine additional deficiencies were reported from these events, two of which were considered operational mission failures.
- During July 2011, DOT&E approved an updated COTF operational test plan, and the Operational Test Agency conducted an Operational Test Readiness Review. As a result, dedicated IOT&E was re-initiated in August 2011.
- During FY11 IT and IOT&E, the Navy fired a total of four missiles at actual and simulated threat targets and emitters. As required by DOT&E, LRIP missiles were used for all live-fire tests.
- As of September 2011, the Navy completed approximately 40 percent of planned operational test sorties, accumulating over 150 hours of missile operating time. These totals include sorties and hours accrued during integrated testing that DOT&E considers operationally representative.
- IOT&E is scheduled to finish in 2QFY12.

Assessment
- Although occurring prior to FY11, DOT&E assessed that four of the six operational mission failures encountered during the first IOT&E period were discoveries developmental testing should have identified.
- IT and dedicated IOT&E is appropriately scoped and resourced with 10 live-fire LRIP missiles, along with captive-carry, reliability, and compatibility testing in operational environments against threat-representative targets. COTF adequately validated and accredited targets for AARGM before the restart of IOT&E.
- Analysis of IT and IOT&E events is ongoing with a corresponding beyond-LRIP report anticipated in 3QFY12.

Recommendations
- Status of Previous Recommendations. The Navy satisfied both FY10 recommendations. The MMW and ARH sensors were characterized in developmental testing, and LRIP missiles are being used for all operational tests.
- FY11 Recommendations. The Navy should:
  1. Conduct sufficient FOT&E to verify the correction of the nine deficiencies discovered during IT and any emergent anomalies during IOT&E.
  2. Conduct sufficient FOT&E to adequately assess those requirements deferred by the change to the AARGM CPD.