

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

Executive Summary

- The AGM-88E Advanced Anti-Radiation Guided Missile (AARGM) program completed IOT&E and conducted an additional Verification of Correction of Deficiencies (VCD) test period during FY12.
- During FY11/12 operational testing, the Navy completed 185 sorties, accumulating 558 hours of missile operating time. The Navy executed 396 captive-carry runs and fired a total of 12 missiles at actual and simulated threat targets and emitters.
- DOT&E published a classified IOT&E report in 4QFY12.
- AARGM is operationally suitable.
- AARGM is not operationally effective. Although AARGM has the potential to eventually provide some improved combat capability against enemy air defenses, the current weapon configuration has multiple performance shortfalls that largely negate its ability to accomplish its mission.
- The Navy expects the AARGM Block 1 Upgrade to address significant performance shortfalls and provide Full Operational Capability, with the associated FOT&E scheduled to commence in FY14.
- Due to deferred capabilities and IOT&E deficiencies, DOT&E anticipates that AARGM FOT&E requirements exceed the program's currently allocated resources for operational testing. A shortage of AARGM telemetry kits is already identified as a potential hindrance to adequate Block 1 testing.

System

- The AGM-88E AARGM is the follow-on to the AGM-88B/C High-Speed Anti-Radiation Missile (HARM) using a modified HARM body and fins. The Navy intends to employ AARGM on F/A-18C/D/E/F and EA-18G platforms.
- AARGM Block 0, intended for Initial Operational Capability, incorporates digital Anti-Radiation Homing (ARH), GPS, and Millimeter Wave (MMW) guidance, and a Weapon Impact Assessment transmitter.
 - 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.

Activity

- In 2QFY10, the Navy issued a change to the AARGM Capability Production Document (CPD) due to limitations discovered during developmental testing. This CPD change delayed the start of IOT&E until 3QFY10 to allow correction of system deficiencies; deferred a Key Performance Parameter



- MMW radar technology allows target discrimination and guidance during the terminal flight phase.
- The Navy expects the AARGM Block 1 Upgrade to deliver Full Operational Capability, including Block 0 capability improvements, as well as an Integrated Broadcast Service Receiver (enables reception of national broadcast data), and software changes to provide deferred capability requirements and address deficiencies identified during IOT&E.

Mission

Commanders employ aircraft equipped with AARGM to 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 defense systems. Commanders receive real-time Weapons Impact Assessments from AARGM via a national broadcast data system.

Major Contractor

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

- target requirement to FOT&E; and clarified the acceptable target environment and reactive targeting constraints for IOT&E.
- In accordance with the DOT&E-approved Operational Test Plan (OTP), the Navy's Commander, Operational Test and

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Evaluation Force (COTF) commenced AARGM IOT&E in June 2010, but in September 2010, the Navy de-certified AARGM from IOT&E after the program suffered six operational mission failures during initial captive-carry flight tests.

- The AARGM program spent most of FY11 correcting hardware and software deficiencies discovered in developmental testing and during its first IOT&E attempt. In July 2011, DOT&E approved an updated AARGM OTP and the Navy re-initiated dedicated IOT&E in August 2011.
- Immediately following the restart of IOT&E, COTF initiated changes to the OTP that were driven by the 2010 CPD change and deficiencies identified since the first IOT&E attempt was terminated. DOT&E approved the requested changes in October 2011.
- The Navy postponed two live-missile test events scheduled for October 2011 due to an emergent anomaly that caused a communication failure between the AARGM Guidance and Control Sections (GS/CS). The Navy identified a short-term solution for this problem and conducted the live-missile events during 2QFY12.
- Immediately preceding a February 2012 test event involving two other live-missile shots, the Navy notified DOT&E that the planned threat scenario would likely result in mission failure due to a classified AARGM deficiency (details available in the classified DOT&E IOT&E report). Without DOT&E consent, the Navy modified the approved test scenario to alleviate the classified deficiency and proceeded with live-missile testing. DOT&E disagreed with the adjusted threat representation and subsequently assessed these events as operational failures.
- COTF completed IOT&E events in 2QFY12, with initial results indicating AARGM was neither operationally effective nor operationally suitable.
- The Navy subsequently completed software changes to address the two most significant deficiencies identified during IOT&E (GS/CS communication failure and a classified performance shortfall) and subsequently conducted a VCD test period during 3QFY12. DOT&E approved the VCD test plan and included the associated data in its IOT&E assessment.
- During operational testing, the Navy fired a total of 12 missiles at actual and simulated threat targets and emitters. As required by DOT&E, low-rate initial production (LRIP) missiles were used for all events.
- In accordance with DOT&E-approved test plans, the Navy completed 185 operational test sorties, accumulating 558 hours of missile operating time. These totals include sorties and hours accrued during integrated testing that DOT&E considered operationally representative, with the exception of the modified threat scenario mentioned above.
- DOT&E published a classified IOT&E report in 4QFY12.
- The Navy's Milestone Decision Authority (MDA) conducted a Full-Rate Production (FRP) Decision Review during 4QFY12. At that review, the Navy authorized AARGM Block 0 for FRP; however, only the first lot of FRP missiles was approved.

Due to AARGM operational effectiveness concerns, the MDA stipulated that a review of FRP and Block 1 progress shall occur before the end of FY13. The MDA intends to base its authorization for another FRP lot on this follow-on review, even though no additional operational testing is planned during FY13.

- The AARGM program hosted an initial T&E Working-level Integrated Product Team meeting in late 4QFY12 to start identifying and coordinating AARGM Block 1 FOT&E requirements. Additional coordination meetings are planned for 1QFY13.

Assessment

- AARGM Block 0 testing was adequate to support an evaluation of the weapon system's operational effectiveness and operational suitability. With the exception of the modified threat scenario mentioned above, the Navy completed testing in accordance with the DOT&E-approved Test and Evaluation Master Plan, OTP, and VCD test plan.
- AARGM Block 0 is operationally suitable. Although the weapon demonstrated poor reliability during IOT&E, the program addressed the primary deficiency affecting reliability and satisfactorily demonstrated this during the VCD test period.
- AARGM Block 0 is not operationally effective. Although AARGM has the potential to eventually provide some improved combat capability against enemy air defenses, the weapon as tested has multiple deficiencies. The details of these deficiencies are detailed in the classified DOT&E IOT&E report. The numerous performance shortfalls identified largely negate AARGM's ability to accomplish its primary mission.
- The Navy expects AARGM Block 1 Upgrade to address significant performance shortfalls and provide Full Operational Capability, with the associated FOT&E scheduled to commence in FY14. DOT&E anticipates that Block 1 FOT&E captive-carry and live-missile firing requirements will exceed the program's currently allocated resources for operational testing. Operational testers have already identified a shortage of AARGM telemetry kits as a potential hindrance to adequate Block 1 testing.

Recommendations

- Status of Previous Recommendations. The two FY11 recommendations remain valid and open. DOT&E requires FOT&E to verify the correction of integrated testing and IOT&E deficiencies and to adequately assess previously deferred capabilities.
- FY12 Recommendations. The Navy should:
 1. Limit FRP quantities until operational effectiveness is properly demonstrated during AARGM Block 1 FOT&E and documented in a DOT&E report.
 2. Ensure adequate inventory of AARGM telemetry kits are available for AARGM FOT&E.