

Advanced Anti-Radiation Guided Missile – Extended Range (AARGM-ER)



In FY25, the Navy successfully completed one of three Advanced Anti-Radiation Guided Missile – Extended Range (AARGM-ER) integrated test (IT) weapon employment events from an F/A-18F. Subsequent weapon test events planned for FY25 have been delayed until problems identified in testing are addressed. AARGM-ER IT weapon employment events are scheduled to resume in 1QFY26. The Navy does not expect formal IOT&E events to begin until after AARGM-ER initial operational capability (IOC), which is now planned for 1QFY27.

SYSTEM DESCRIPTION

The AGM-88G AARGM-ER is an air-to-ground missile that employs a multi-mode seeker to passively detect and guide on radio frequency (RF) emissions from a threat radar site, and then transition to an active millimeter-wave terminal radar seeker to detect, track, and suppress or destroy RF-enabled, surface-to-

air missile systems. AARGM-ER uses the same millimeter-wave radar as AARGM, but has a new warhead, a larger diameter, a shorter length to enable F-35A/C internal weapons bay carriage, and a new rocket motor that provides increased range against surface-to-air threats. The F/A-18E/F and EA-18G are threshold platforms for the AARGM-ER. The F/A-18C/D and F-35A/B/C (internal carriage for the F-35A/C variants and external carriage for all variants) are designated as objective platforms.

MISSION

Commanders will use aircraft equipped with AARGM-ER to suppress or destroy enemy air defenses. AARGM-ER will detect, track, and suppress or destroy RF-enabled, surface-to-air missile systems that employ shutdown tactics, a common technique of modern systems, which the multi-mode seeker of AARGM-ER is intended to counter.

PROGRAM

AARGM-ER is an Acquisition Category IB program. DOT&E approved the AARGM-ER Milestone C TEMP in May 2021 and an updated cybersecurity test strategy in August 2022. The production and deployment phase, along with the award of the first low-rate initial production (LRIP) contract, came after the Navy’s Knowledge Point-4 program review in July 2021.

DOT&E approved the IT portion of the IOT&E test plan in October 2023. Due to problems identified during qualification and weapon employment testing, the Navy is now planning for AARGM-ER IOC in 1QFY27, which is prior to the expected start of formal IOT&E events. DOT&E previously expected IOC to occur in 4QFY25, as stated in the FY24 Annual Report.

The AARGM-ER full-rate production (FRP) decision is planned for 1QFY30. Due to delays in development and to the incremental hardware and software changes in LRIP lots, the integrated and operational test strategy has changed significantly since the AARGM-ER Milestone C TEMP was approved. The TEMP’s flight test strategy has not been updated to ensure that IOT&E is resourced to adequately evaluate both the intended AARGM-ER FRP configuration, and the planned incremental hardware and software changes between LRIP lots leading to the FRP configuration.

» MAJOR CONTRACTOR

- Northrop Grumman Corporation – Northridge, California

TEST ADEQUACY

In FY25, the program attempted three IT weapon employment tests using F/A-18F aircraft against a threat-representative integrated air defense land target at the China Lake Range in California. Testing was accomplished in accordance with the DOT&E-approved IT plan and observed by DOT&E. AARGM-ER successfully completed one of the three weapon events but exhibited performance discrepancies during the other two, to include one event during which range safety terminated the weapon after release. No further weapons employment testing was accomplished in FY25 pending implementation of updates required to address the problems that were identified.

Prior to restart of IT weapon employment testing, the program would benefit from an overall increase in the number of captive-carry events to better characterize performance and support problem identification and correction prior to a restart of weapon employment events.

The Navy has made limited progress collecting and analyzing data to support modeling and simulation (M&S) verification and validation (V&V). This lack of progress has been compounded by issues identified during testing that have resulted in test events that yield limited or no data, and by the subsequent software, changes required to address issues.

As discussed in the FY24 Annual Report, the extended range and advanced capabilities of AARGM-ER, along with the requirement to test against

advanced target sets in threat-representative and contested electromagnetic operational environments, exceed the infrastructure capabilities of most test ranges. As a result, adequate range capability and availability continues to be a challenge for the program, necessitating adjustments to the test plan and contributing to further schedule delays. Three of the four IT weapon employment tests attempted thus far demonstrated progress in this regard, as cooperation between the Air Force’s Nevada Test and Training Range, the Navy’s China Lake Range, and the FAA enabling employment of AARGM-ER shots from one range to a complex target set in the other, at near threshold employment range of the missile.

The program did not conduct cyber survivability test events in FY25. Since multiple software changes have been implemented since the April 2024 cooperative vulnerability and penetration assessment (CVPA), DOT&E may require additional CVPA testing before the adversarial assessment.

The program completed five arena tests of the newly designed AARGM-ER warhead between December 2021 and September 2023 and provided data to DOT&E to create lethality data files required by the M&S to evaluate effectiveness against modeled targets. The data are also used to optimize system weaponing and fuzing against a range of operational targets. Once flight testing resumes, DOT&E will analyze the potential impacts from the lethality test data to evaluate more M&S scenarios, and suggest fuzing and weaponing updates, as required.

PERFORMANCE

» EFFECTIVENESS, LETHALITY, SUITABILITY, AND SURVIVABILITY

The current data are insufficient to provide a preliminary assessment of AARGM-ER operational effectiveness, suitability, survivability, or lethality. Additional testing and flight data collection of the AARGM-ER are required, from both F/A-18E/F and the EA-18G threshold platforms. Successful end-to-end functionality of all AARGM-ER-designed missile components, employed from the threshold range or beyond, has not yet been demonstrated.

- recommended in the FY23 and FY24 Annual Reports.
4. Increase the completeness and adequacy of data for M&S V&V with an overall increase in the number of captive-carry events, to better identify discrepancies before IOC, as recommended in the FY23 and FY24 Annual Reports.
 5. Incorporate the EA-18G threshold platform into IOT&E weapon employment events.

RECOMMENDATIONS

The Navy should:

1. Update the AARGM-ER TEMP flight test strategy and submit it for DOT&E's approval prior to the start of dedicated operational testing.
2. Update the IOT&E test plan with DOT&E recommendations and submit it for DOT&E's approval prior to the start of dedicated operational testing, as recommended in the FY24 Annual Report.
3. Demonstrate a successful end-to-end operational test of AARGM-ER by employing at or beyond the threshold range out to the objective range, including a demonstration of missile guidance and warhead lethality, in an operationally realistic environment during IOT&E, as