

F/A-18 E/F Hornet Naval Strike Fighter (All Upgrades)

Executive Summary

- The first FOT&E of the APG-79 Active Electronically Scanned Array (AESA) occurred November 2007 through July 2008 concurrent with FOT&E and Software Qualification Testing for the F/A-18E/F Super Hornet. Testing was adequate to assess operational effectiveness and suitability. This analysis is ongoing.
- After the 2006 Operational Evaluation (OPEVAL), both Commander, Operational Test and Evaluation Force (COTF) and DOT&E found the APG-79 radar system as installed in the F/A-18E/F not operationally effective and not operationally suitable for combat – noting numerous deficiencies, immature modes of operation, and software instability. COTF did not recommend routine deployment of the system, but recommended the system be used for training pending correction of deficiencies.
- The Navy deployed the first APG-79 AESA-equipped squadron in May 2008 prior to the completion of the FOT&E period. COTF promulgated an interim report stating that the program manager made significant progress, but certain deficiencies have not been corrected.

System

- The Super Hornet is replacing earlier F/A-18 variants in the Navy's carrier air wings. The F/A-18E is a single-seat aircraft and the F model has two seats.
- The H3E software upgrade provides functionality essential to the integration and operation of all Super Hornet Block 2 hardware upgrades. These upgrades provide capabilities including:
 - Single pass multiple targeting for GPS weapons
 - Use of all AIM-9 series infrared-guided missiles, AIM-120, and AIM-7 radar-guided missiles
 - Off-board target designation
 - Improved data link target coordinate precision
 - Implementation of air-to-ground target points
- The APG-79 radar is one of several sub-systems that comprise the F/A-18E/F planned common avionics suite upgrade (Block 2), which will be integrated into Lot 26 aircraft and beyond.
- The aircraft carries the Advanced Targeting Forward Looking Infrared (ATFLIR) system that the aircrew uses in order to locate surface and airborne targets. The ATFLIR will have an infrared marker and laser target designator/ranger capability in addition to being able to provide infrared and/or electro-optical streaming video via data link. The laser target designator/ranger provides the F/A-18E/F with the ability to obtain GPS-guided weapons-quality target coordinates. The



Navy can also use the laser designator/ranger for delivery of laser-guided bombs, while the infrared marker provides air-to-ground cueing to both ground and aerial observers equipped with night vision devices.

- The Super Hornet is also fitted with the Shared Reconnaissance Pod, the Multi-Functional Information Distribution System for Link 16 tactical data link connectivity, the Joint Helmet-Mounted Cueing System, and the Integrated Defensive Electronic Countermeasures system. The Joint Mission Planning System-Maritime is the fleet mission planning system.

Mission

Carrier Strike Group Commanders and Joint Force Air Component Commanders use the F/A-18E/F to:

- Conduct air combat missions
- Attack ground targets with most of the U.S. inventory of GPS-guided, laser-guided, and free-fall weapons, as well as the 20 mm cannon
- Fire the High-Speed Anti-Radiation missile at enemy radar systems
- Provide in-flight refueling for other tactical aircraft
- Provide the fleet with an organic tactical reconnaissance capability available for tasking by the Carrier Strike Group Commander and supported Joint Task Force

Prime Contractor

- Boeing

NAVY PROGRAMS

Activity

- The Navy conducted the first FOT&E of the APG-79 AESA concurrent with the Software Configuration Set (SCS) H4E Software Qualification Test (SQT) from November 2007 through July 2008. F/A-18E/F aircraft with H4E software installed with APG-79 AESA radars flew 154 flight hours in 111 sorties.
- FOT&E included a detachment to Eglin AFB, Florida, where the F/A-18E/F flew against Air Force F-15C aircraft.
- H4E testing intended to address the last two remaining capability waivers from the F/A-18E/F OPEVAL - Advanced Navigation Accuracy and Electronic Protection. Testing included aircraft with Advanced Navigation, Digital Memory Devices, BRU-55 Smart Rack (for smart and conventional weapons), AIM-120 High-Off Boresight (HOBS) capability, and Type 3 Advanced Mission Computers. The ATFLIR targeting pod and the APG-79 AESA radar were two major subsystems also under test.
- The Program Office conducted two AIM-120 live fire events to demonstrate APG-73 HOBS capability.
- The Navy intended the APG-79 AESA testing to support the first fleet deployment of this system by verifying correction of deficiencies identified in OPEVAL, evaluating Anti-Tamper capability, and the inherent electronic protection capability of the radar. The Program Office deferred development of the full electronic warfare capability of the radar to subsequent SCS iterations.
- The COTF assessment concluded that routine operational deployment, specifically the use of air-to-ground ordnance in Operations Iraqi and Enduring Freedom was low risk. COTF also assessed that employment in other classified threat environments remained high risks.
- The Navy acquired the APG-79 radar to improve capability over the legacy APG-73 radar in terms of independent cockpits, detection range, and electronic protection. The APG-79 has shown capability in these three areas; detailed results are classified. APG-79 system reliability remains below expected thresholds, with both hardware and software failures.
- DOT&E concurs with both COTF assessments stated above.
- The program did not demonstrate the APG-79's ability to support multiple AIM-120 missiles in-flight with data link. This capability for the warfighter must be demonstrated.
- The Navy's test squadron has made significant advances in data collection and analysis. Data provided from this FOT&E period represents a major improvement relating to data collection, reduction, and analysis.

Recommendations

- Status of Previous Recommendations. The Navy has yet to complete either of the two FY07 recommendations.
- FY08 Recommendation.
 1. The Navy should correct the major deficiencies identified in the COTF interim and final FOT&E reports.

Assessment

- COTF submitted an interim report to support the fleet deployment of the APG-79 prior to the completion of FOT&E. COTF stated that significant progress had been made, but certain deficiencies had not been corrected.