

E-2D Advanced Hawkeye

Executive Summary

- The Commander, Operational Test and Evaluation Force (COTF) conducted the first E-2D Advanced Hawkeye FOT&E period in 2QFY14 to evaluate the E-2D Initial Operational Capability hardware and software configuration: Delta System/Software Configuration (DSSC) Build 1. COTF completed testing in 3QFY15.
- FOT&E showed the E-2D had no significant performance differences compared to IOT&E and was adequate to assess E-2D suitability and effectiveness for legacy E-2C missions. Unlike the IOT&E, FOT&E included adequate E-2D carrier testing. An evaluation on E-2D's capability to perform the Theater Air and Mission Defense (TAMD) mission cannot be made until future FOT&E periods. DOT&E will submit an FOT&E report on the E-2D in 2QFY16.
- Change 1 to the E-2D Test and Evaluation Master Plan (TEMP) revision D supports the second FOT&E period, which includes requirements or resources for integration and operational testing of Naval Integrated Fire Control-Counter Air (NIFC-CA) From the Air (FTA). Change 1 will address NIFC-CA FTA areas relevant to E-2D only, and to support DSSC Build 2 in 3QFY16 for FOT&E.

System

- The E-2D is a carrier-based Airborne Early Warning and Command and Control aircraft.
- Significant changes to this variant of the E-2 include upgraded engines to provide increased electrical power and cooling relative to current E-2C aircraft; a strengthened fuselage to support increased aircraft weight; replacement of the radar system, the communications suite, and the mission computer; and the incorporation of an all-glass cockpit, which permits the co-pilot to act as a tactical fourth operator in support of the system operators in the rear of the aircraft.
- The radar upgrade replaces the E-2C mechanically scanned radar with a phased-array radar that has combined mechanical and Electronically Scanned Array capabilities.

Activity

- COTF conducted E-2D carrier testing, a major shortfall of the IOT&E, in September and October 2014, onboard the USS *Theodore Roosevelt*.
- In 2QFY14, COTF conducted the E-2D's first FOT&E period to assess the operational effectiveness and suitability of hardware and software changes incorporated in DSSC Build 1 and to support the TAMD mission. The Navy conducted testing at Naval Air Station (NAS) Patuxent River, Maryland; Holloman AFB, New Mexico; White Sands Missile Range,



- The upgraded radar is intended to provide significant improvement in littoral and overland detection performance and TAMD capabilities.
- The E-2D Advanced Hawkeye Integrated Training System includes all simulators, interactive computer media, and documentation to conduct maintenance, as well as aircrew shore-based initial and follow-on training.

Mission

The Combatant Commander, whether operating from the aircraft carrier or from land, will use the E-2D Advanced Hawkeye to accomplish the following missions:

- Theater air and missile sensing and early warning
- Battlefield management, command, and control
- Acquisition, tracking, and targeting of surface warfare contacts
- Surveillance of littoral area objectives and targets
- Tracking of strike warfare assets

Major Contractor

Northrop Grumman Aerospace Systems – Melbourne, Florida

New Mexico; NAS Point Mugu, California; NAS Norfolk, Virginia; USS *Theodore Roosevelt* (CVN 71); and Naval Air Weapons Station China Lake, California, in accordance with the DOT&E-approved TEMP and test plan. FOT&E completed in 3QFY15.

- Per the FOT&E test plan, the Navy only conducted a qualitative assessment on E-2D training devices (such as simulators) and student training time. The second FOT&E period will have a full training assessment.

FY15 NAVY PROGRAMS

- In 2QFY16, DOT&E will submit an FOT&E report on the E-2D.
- Change 1 to the E-2D TEMP revision D supports the second FOT&E period, which includes requirements for resources and integration of operational testing of NIFC-CA FTA. Change 1 will address NIFC-CA FTA areas relevant to E-2D only, and to support DSSC Build 2 in 3QFY16 for FOT&E. Change 1 will also include cybersecurity testing in accordance with DOT&E's guidelines detailed in Procedures for Operational Test and Evaluation of Cybersecurity Acquisition Programs, dated August 1, 2014.
- The Navy continues to correct deficiencies with E-2D Cooperative Engagement Capability performance with a plan to have deficiencies remedied in 1QFY19 with fielding of DSSC Build 3.

Assessment

- E-2D carrier suitability performance is similar to the aircraft's performance when it is disembarked.
 - FOT&E showed the E-2D has no significant performance differences compared to IOT&E, but has similar shortfalls on some radar reliability, availability, and weapon system metrics. FOT&E was adequate to assess E 2D suitability and effectiveness for legacy E-2C missions. An evaluation on E-2D's capability to perform the TAMD mission cannot be made until future FOT&E periods.
 - DOT&E's classified report will explain all findings in more detail.
- Change 1 to the E-2D TEMP revision D will address requirements and resources for integrated or operational testing of NIFC-CA FTA and will include more evolved cybersecurity testing. DOT&E is providing cybersecurity guidance to Change 1 and all subsequent TEMPs for future FOT&E periods.
 - A full assessment of E-2D operational capabilities will require future FOT&Es and systematic updates.

Recommendations

- Status of Previous Recommendations. The Navy continues to improve radar and mission system performance and to improve radar and overall weapon system reliability and availability as previously recommended.
- FY15 Recommendations. The Navy should:
 1. Provide complete training on all components of the E-2D system and missions.
 2. Complete the Change 1 to the E-2D TEMP revision D and test plan.
 3. Incorporate DOT&E guidance in its cybersecurity testing for all subsequent FOT&E periods.
 4. Improve radar and overall weapon system reliability and availability.
 5. Continue to correct E-2D Cooperative Engagement Capability performance deficiencies.