

P-8A Poseidon Multi-Mission Maritime Aircraft (MMA)

Executive Summary

- The P-8A Engineering Change Proposal (ECP) 2 OT&E began in November 2016. Test events and data analysis are expected to continue through December 2017. Pending final DOT&E data analysis, preliminary test results indicate significant improvement in intelligence, surveillance, and reconnaissance (ISR) mission capabilities and successful integration of AGM-84D Block 1 advanced surface warfare (SUW) employment modes. Demonstrated P-8A air-to-air refueling capabilities support initial operational training and employment. P-8A Multi-static Active Coherent (MAC) sensor wide-area anti-submarine warfare (ASW) search test results are inconclusive because only 6 of 24 planned test events were accomplished, mainly due to lack of submarine target availability. DOT&E reviewed and approved a revised Navy proposal to complete P-8A MAC test events in future operational test periods.
- The Navy did not complete P-8A Increment 3 Test and Evaluation Master Plan (TEMP) development in FY17 due to program delays, budget uncertainty, and P-8A Increment 2 program delays. However, the Navy did complete detailed operational test plans for near-term Increment 3 ECP 4 and ECP 5 OT&E events in FY18 and FY19. These plans are adequate to evaluate initial Increment 3 capabilities. P-8A ECP 6 and ECP 7 detailed test strategy and TEMP development were deferred until final system operational requirements and capabilities are defined prior to the planned system critical design review in FY19.
- In FY17, the Navy initiated a re-evaluation of proposed high-altitude ASW operational concepts and requirements. Demonstration of an initial high-altitude sonobuoy employment capability is planned during the FY18 P-8A ECP 4 operational test event. High-Altitude ASW Weapon Capability (HAAWC) MK 54 torpedo developmental testing continued to progress in FY17. The Navy is scheduled to begin P-8A integration testing in FY18 leading to operational testing of the HAAWC system on the P-8A in FY19.
- In FY17, the Navy completed landing gear fatigue test assembly data analysis with no significant findings. Teardown of the full-scale aircraft fatigue test article will occur when all extended life test events are complete in January 2018. The program continues to review the full-scale test article data to refine fleet airframe inspection requirements and depot repair procedures to ensure the airframe meets the intended 25-year design life. To date, no significant long-term structural problems have been identified.

System

- The P-8A Poseidon Multi-mission Maritime Aircraft (MMA) design is based on the Boeing 737-800 aircraft with significant



- modifications to support Navy maritime patrol mission requirements. It is replacing the P-3C Orion.
- The P-8A incorporates an integrated sensor suite that includes radar, electro-optical, and electronic signal detection sensors to provide search, detection, location, tracking, and targeting capability against surface targets. An integrated acoustic sonobuoy launch and monitoring system provides search, detection, location, tracking, and targeting capability against submarine targets. Sensor systems also provide tactical situational awareness information for dissemination to fleet forces and ISR information for exploitation by the joint intelligence community.
- The P-8A carries MK 54 torpedoes and the AGM-84D Block 1C Harpoon anti-ship missile system to engage submarine and maritime surface targets.
- The P-8A aircraft incorporates aircraft survivability enhancement and vulnerability reduction systems. An integrated infrared missile detection system, flare dispenser, and directed infrared countermeasure system is designed to improve survivability against infrared missile threats. On- and off-board sensors and datalink systems are used to improve tactical situational awareness of expected threat systems. Fuel tank inerting and fire protection systems reduce aircraft vulnerability.
- The Navy is integrating the MAC sensor system into the P-8A to provide a wide-area, active ASW search capability.
- Planned future upgrades include the addition of the HAAWC MK 54 torpedo, AGM 84 Harpoon II+, MAC wide-area ASW search enhancements, signals intelligence sensors, and advanced mission system architectures and processing upgrades.

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Mission

- Theater Commanders primarily use units equipped with the P-8A MMA to conduct ASW operations including the detection, localization, tracking, and destruction of submarine targets.
- Additional P-8A maritime patrol missions include:
 - SUW operations to detect, identify, track, and destroy enemy surface combatants or other maritime targets
 - ISR operations to collect and disseminate imagery and signals information for exploitation by the joint intelligence community
 - Command, control, and communication (C3) operations to collect and disseminate tactical situation information to fleet forces
 - Identification and precise geolocation of targets ashore to support fleet strike warfare missions

Major Contractor

Boeing Defense, Space, and Security – St. Louis, Missouri

Activity

- The P-8A ECP 2 OT&E, originally planned for early FY16, began in November 2016 following delays due to ASW software deficiencies discovered in developmental testing. P-8A ECP 2 OT&E events and data analysis are expected to continue through December 2017. This operational test includes evaluation of:
 - P-8A wide-area ASW search capability with the MAC sensor system
 - P-8A ISR mission capabilities following system improvements to address previous operational test failures
 - A system-level cybersecurity assessment
 - Air-to-air refueling capabilities
 - Advanced AGM-84 Block 1C Harpoon missile employment modes
 - Communication system enhancements
 - Operational availability with a fully mature logistics support system
 - Corrective actions for at least 37 significant operational deficiencies identified during previous test periods
- In April 2016, USD(AT&L) approved a revised Navy P-8A acquisition strategy that incorporated all P-8A Increment 3 capability requirements into the baseline P-8A program. These capabilities will now be developed and delivered as a series of ECPs (4 through 7). P-8A ECP 4 and ECP 5 are limited to software-based improvements to the P-8 AN/APY-10 radar, AGM-84D Block 2+ anti-ship missile integration, and communication system enhancements.
- The Navy did not complete P-8A Increment 3 (ECP 4 through 7) TEMP development in FY17 due to program delays, budget uncertainty, and P-8A Increment 2 program delays. However, the Navy did complete detailed operational test plans for near-term ECP 4 and ECP 5 OT&E events in FY18 and FY19. P-8A ECP 6 and ECP 7 TEMP and test design development was deferred until final system operational requirements and capabilities are defined prior to the planned system critical design review in FY19.
- The Navy continues to plan and progressively execute the P-8A MAC wide-area ASW search operational test events as defined in the 2013 P-8A TEMP. Some P-8A MAC test events were conducted in conjunction with the P-8A ECP 2 OT&E period. Future P-8A MAC test events are planned for the ECP 4, ECP 5, and ECP 7 operational test periods. Additional dedicated P-8A MAC test events may also be conducted as appropriate submarine targets become available.
- In FY17, the Navy initiated a re-evaluation of proposed high-altitude ASW operational concepts and requirements. HAAWC MK 54 torpedo system developmental testing continued to progress in FY17. Demonstration of an initial high-altitude sonobuoy employment capability is planned during the FY18 P-8A ECP 4 operational test event. Following a review of operational concepts and requirements, P-8A integration testing is scheduled to begin in FY18 leading to operational testing of the HAAWC MK 54 torpedo system on the P-8A in FY19.
- The Navy completed the distributed load, extended lifetime of fatigue and durability testing on P-8A full-scale test aircraft and is continuing extended lifetime testing. Full-scale aircraft testing is expected to be complete in January 2018 followed by teardown and final data analysis. The horizontal stabilizer subsystem completed three lifetimes of fatigue testing in FY17. Final teardown and data analysis for this subsystem is in progress.

Assessment

- Pending final DOT&E data analysis, preliminary P-8A ECP 2 test results indicate significant improvement in ISR mission capabilities and successful integration of AGM-84D Block 1 advanced employment modes. Demonstrated P-8A air-to-air refueling capabilities support initial operational training and employment. P-8A MAC ASW wide-area search test results were inconclusive because only 6 of 24 planned test events were accomplished, mainly due to lack of submarine target availability. DOT&E reviewed and approved a revised Navy proposal to complete P-8A MAC test events in future operational test periods.
- The plans for near-term P-8A Increment 3 ECP 4 and ECP 5 OT&E events are adequate to evaluate initial Increment 3 capabilities. These tests are on track to begin as scheduled in early FY 18.
- Operational testing of the emerging P-8A high-altitude ASW capability, including the HAAWC MK 54 torpedo system, is currently planned for FY19. However, the lack of clear

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Navy high-altitude ASW concept of operations has delayed development of employment tactics and operational test plans.

- In FY17, the Navy completed landing gear fatigue test assembly data analysis with no significant findings. Teardown of the full-scale aircraft fatigue test article will occur when all extended life test events are complete in January 2018. The program continues to review the full-scale test article data to refine fleet airframe inspection requirements and depot repair procedures to ensure the airframe meets the intended 25-year design life. To date, no significant long-term structural problems have been identified.

Recommendations

- Status of Previous Recommendations. The Navy made progress on two of three FY16 recommendations. Corrective actions were implemented for at least 37 of 106 operationally significant system deficiencies identified in previous P-8A operational test reports. A more comprehensive P-8A cybersecurity assessment was conducted as part of the P-8A ECP 2 OT&E. The Navy did not complete development of a P-8A Increment 3 TEMP due to program funding uncertainty and delayed execution of the ECP 2 OT&E.
- FY17 Recommendations. The Navy should:
 1. Complete P-8A MAC ASW wide-area search operational testing as defined in the 2013 P-8A TEMP and the updated FY17 test execution strategy.
 2. Coordinate with DOT&E to develop a detailed P-8A Increment 3 ECP 6/7 test strategy prior to system critical design review in FY19.
 3. Conduct operational testing of the complete P-8A high-altitude ASW operational capability in conjunction with planned integration of the HAAWC MK 54 torpedo system.

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