

## P-8A Poseidon

### Executive Summary

- DOT&E approved an operational assessment (OA) test plan in September 2009. The Navy began testing in the Systems Integration Lab (SIL) to support the Milestone C decision.
- Contractor developmental live fire ballistic vulnerability testing determined fire suppression system design requirements.

### System

- The P-8A Poseidon is the Navy's next generation maritime patrol aircraft that will replace the P-3C.
- The P-8A is based on the Boeing 737-800 aircraft, but uses the 737-900 extended-range wing.
- It carries and employs anti-ship missiles, air-to-surface weapons, torpedoes, naval mines, sonobuoys, and other expendables.
- The P-8A onboard sensors include acoustics, radar, missile warning system (MWS), and electro-optic sensors.
- Survivability enhancement and vulnerability reduction features are incorporated into the P-8A design.
  - Susceptibility is reduced with an integrated Aircraft Survivability Equipment suite that consists of a radar warning receiver, chaff/flare dispenser, MWS, directed infrared countermeasures, and Electronic Warfare Management Unit to control the system. Radio frequency countermeasures, based on a towed decoy, are planned for spiral development with installation provisions (including wiring and mounting pylons) incorporated into all production aircraft.
  - Vulnerability is reduced through the addition of fuel tank inerting systems and fire protection systems for the vulnerable dry bays that surround aircraft fuel tanks.



### Mission

Units equipped with the P-8 will perform a wide-range of patrol missions including the following:

- Armed anti-submarine warfare
- Armed anti-surface warfare
- Intelligence collection, processing, evaluation, and dissemination to Naval and joint forces
- Maritime and littoral reconnaissance missions

### Prime Contractor

- The Boeing Company, Integrated Defense Systems, St. Louis, Missouri

### Activity

- The Boeing Company conducted the first contractor test flight of the T-1 (test) aircraft on April 25, 2009, and the first contractor test flight of the T-2 aircraft on June 5, 2009. Both test flights were approximately three-hour limited systems check flights conducted in the Seattle, Washington, area.
- The Boeing Company conducted structural testing on the S-1 (static test) aircraft throughout 2009 in order to support the airworthiness flight testing. The initial structural testing was required to clear 80 percent of the flight envelope. Structural testing will continue through 2010 to clear 100 percent of the flight envelope.
- DOT&E approved an OA test plan in September 2009. The Navy began testing in the SIL to support the Milestone C decision. The focus of the OA is to test the software and

- hardware functionality, integration, and interoperability in a laboratory environment using actual P-8A hardware and software. The Navy conducted the tests using scenarios in simulated, yet operationally representative, environments. Navy personnel operated the P-8A equipment during testing, i.e., flying the aircraft simulator and manning the aircrew workstations. The OA is scheduled to conclude in November 2009.
- Detailed planning continued for the first five test aircraft being tested during the system development and demonstration (SDD) phase. Once all test aircraft are delivered to the Navy, there will be approximately 35 test flights per month during SDD. The IOT&E is scheduled to begin in February 2012.

# NAVY PROGRAMS

- Flight testing of the T-1 began in October 2009. The T-1 test aircraft is used for airworthiness testing; it is heavily instrumented, but does not have the mission systems (e.g., sensors) integrated onboard the aircraft. Flight testing of T-2 is scheduled to start in February 2010. The T-2 aircraft has the full mission equipment (e.g., sensors, onboard computers, and aircrew workstations) integrated onboard.
- The Navy has collected reliability and maintainability data throughout the OA and flight testing. A separate maintainability demonstration is scheduled to begin in November 2009.
- The Test and Evaluation Master Plan is being updated to support the Milestone C decision in May 2010.
- Contractor developmental ballistic testing showed that fuel spillage from threat-damaged lower fuselage fuel tanks results in fuel vapor build-up and potential for explosion in the lower fuselage. A lower fuselage liquid fuel drain and fuel vapor

ventilation system and explosive fuel vapor sensors are being incorporated into the P-8A design to address these issues.

## **Assessment**

- The structural testing required to clear 80 percent of the flight envelope was successful. Structural testing to clear 100 percent of the flight envelope has taken longer than expected and requires an additional seven months of scheduled testing on the S-1 test aircraft. The scheduled initial operational capability is not impacted.
- Live Fire testing planned for FY12 will assess the effectiveness of the design changes.

## **Recommendations**

- Status of Previous Recommendations. The Navy is addressing previous recommendations.
- FY09 Recommendations. None