

## P-8A Poseidon

### Executive Summary

- The first P-8A test aircraft rolled off the assembly line in July 2008. The first flight by the system contractor is scheduled for March 2009. The contractor will deliver the test aircraft to the Navy for their first test flight in August 2009.
- The detailed test planning for the System Development and Demonstration (SDD) phase began in FY08. There will be approximately 30 test flights per month during the SDD phase, which precedes the IOT&E beginning in 2012.
- 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 (ASE) suite that consists of a radar warning receiver, chaff/flare dispenser, MWS, directed infrared countermeasures (DIRCM), and electronic Warfare Management Unit (EWMU) 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:

- 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

- Boeing

### Activity

- DOT&E approved the updated Test and Evaluation Master Plan (TEMP) in 2007 with the provision that the Navy retain P-3 flights in the test program to validate the modeling and simulation efforts used to characterize the P-3 baseline performance.
- The contractor is integrating and testing the actual system hardware in their Systems Integration Lab (SIL) prior to the beginning of flight testing. The contractor's SIL includes multiple simulators, benches, and workstations.
- The first P-8A test aircraft left the assembly line in July 2008. The first flight by the system contractor, Boeing, is scheduled

- for March 2009. The contractor will deliver the test aircraft to the Navy for their first test flight in August 2009.
- The Integrated Test Team (ITT) began detailed planning for the first five test aircraft being tested during the SDD phase. Once the contractor delivers the aircraft to the Navy, there will be approximately 30 test flights per month during the SDD phase. The IOT&E is scheduled to begin in January 2012.
- The program is updating the TEMP to support the Milestone C decision in 2010.
- The contractor completed developmental ballistic testing to determine the P-8A dry bay fire vulnerabilities and to define

the dry bay fire suppression requirements. The FY08 portion of the ballistic testing concentrated on vulnerabilities of and fire suppression requirements for:

- The aft electronic equipment bay
- The aft integral and mid auxiliary fuel tanks
- The forward auxiliary fuel tanks

## Assessment

- The Navy's evaluation of the P-8A should include a comparison to the current mission capabilities of the Navy's P-3 aircraft. If data from modeling and simulation is used in lieu of side-by-side flight testing, the Navy needs to develop a methodology to collect P-3 data to validate further the models that characterize the P-3 baseline performance. The Navy has not yet developed a data collection plan.
- The SIL build-up of capabilities is progressing satisfactorily.
- The contractor-developed dry bay fire suppression system did not consistently suppress all dry bay fires. The program is reviewing the results and formulating a plan of action that may include additional testing.
- 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 is under consideration for incorporation to resolve this issue. Further testing is required to establish the adequacy of this approach.

- Developmental testing has shown the possibility of fuel and fire entering the crew cabin in some cases of fuel tank ballistic penetrations. The Navy will further assess this issue in full-scale testing to be conducted in FY12.

## Recommendations

- Status of Previous Recommendations. The Navy addressed all previous recommendations.
- FY08 Recommendations.
  1. The Navy's future full-scale testing should include measurements to determine:
    - The effectiveness of lower lobe ventilation systems in reducing aircraft vulnerability to lower fuselage fuel vapor explosion
    - The vulnerability/crew casualty potential resulting from fire spread into the cabin from the lower fuselage
  2. The Navy must develop a methodology and data collection criteria to perform the P-3/P-8A comparison and document in the next TEMP update.