

MQ-4C Triton Broad Area Maritime Surveillance (BAMS)

Executive Summary

- DOT&E approved the MQ-4C Triton Broad Area Maritime Surveillance (BAMS) Test and Evaluation Master Plan (TEMP) in January 2012 to guide system development and operational testing through an initial operational assessment and Milestone C Low-Rate Initial Production (LRIP) decision.
- The Navy postponed MQ-4C first flight and the start of developmental flight testing from May 2012 until at least January 2013 due to aircraft flight control computer software stability problems. Resulting test schedule revisions compress developmental and operational test events and significantly increase schedule risk prior to the planned operational assessment in June 2013 and the Milestone C decision in October 2013. The reduction in planned developmental testing means that evaluating the planned operational assessment is particularly critical to an informed production decision.
- The Navy began the Multi-Function Active Sensor (MFAS) radar payload risk-reduction flight test program in December 2011 using a Northrop Grumman surrogate test bed aircraft to identify and resolve potential radar performance problems prior to integration on the MQ-4C air vehicle.
- In June 2012, a Navy BAMS-Demonstrator (BAMS-D) aircraft crashed during a training mission near Patuxent River Naval Air Station, Maryland. The aircraft was one of five Air Force RQ-4A Global Hawk Block 10 aircraft acquired by the Navy to provide interim support for U.S. Central Command operations and develop unmanned maritime surveillance tactics and doctrine. This mishap did not affect the MQ-4C Triton development and test program.

System

- The MQ-4C Triton BAMS unmanned aircraft system is an Intelligence, Surveillance, and Reconnaissance system-of-systems consisting of the high-altitude, long-endurance MQ-4C air vehicle, sensor payloads, and supporting ground control stations. The MQ-4C system is a part of the Navy Maritime Patrol and Reconnaissance family-of-systems, with capabilities designed to complement the P-8A Poseidon.
- The MQ-4C air vehicle design is based on the Air Force RQ-4B Global Hawk air vehicle with significant modifications that include strengthened wing structures, anti-ice and de-icing systems, and an air traffic de-confliction and collision avoidance radar system.



- The MQ-4C is equipped with the MFAS maritime surveillance radar to detect, identify, and track surface targets and produce high-resolution imagery. The BAMS Electro-Optical Infrared Sensor provides full motion video and still imagery of surface targets. An Electronic Support Measures system detects, identifies, and geo-locates radar threat signals. An Automatic Identification System (AIS) receiver permits the detection, identification, geo-location, and tracking of cooperative vessels equipped with AIS transponders.
- Onboard line-of-sight and beyond line-of-sight datalink systems transmit sensor data from the air vehicle to ground control stations for dissemination to fleet tactical operation centers and intelligence exploitation sites.

Mission

- Commanders use units equipped with MQ-4C to conduct maritime surveillance operations and provide high-altitude, long-endurance intelligence collection.
- MQ-4C operators detect, identify, track, and assess maritime and littoral targets of interest and collect imagery and signals intelligence information. Operators disseminate sensor data to fleet units to support a wide range of maritime missions to include surface warfare, intelligence operations, strike warfare, maritime interdiction, amphibious warfare, homeland defense, and search and rescue.

Major Contractor

Northrop Grumman Aerospace Systems, Battle Management and Engagement Systems Division – Bethpage, New York

Activity

- DOT&E approved the MQ-4C TEMP in January 2012 to guide system development and operational testing through an initial operational assessment and Milestone C LRIP decision.
 - The Navy postponed MQ-4C first flight and the start of developmental flight testing from May 2012 until at least December 2012 due to aircraft mission computer software stability problems.
 - The program also deferred development and testing of some air vehicle and sensor capabilities until after Milestone C in order to reduce current test schedule pressures. The program is currently assessing the potential effect of these deferrals on post-Milestone C test schedules leading to the planned IOT&E in FY15.
 - In June 2012, the first MQ-4C developmental test aircraft began initial ground test activities leading to first flight.
 - The Navy began MFAS radar payload risk-reduction flight test program in December 2011 using a Northrop Grumman surrogate test bed aircraft to identify and resolve potential radar performance problems prior to integration on the MQ-4C air vehicle.
- more slowly than expected. Additional ground test delays encountered in early FY13 may result in further delays in the flight test program.
- The MFAS radar risk-reduction flight test program progressed more slowly than the Navy expected in FY12. The program is currently focusing MFAS flight test activities on improving identified sensor software stability, maritime target detection and tracking consistency, and radar image quality issues.
 - In June 2012, a Navy BAMS-D aircraft crashed during a training mission near Patuxent River Naval Air Station, Maryland. The aircraft was one of five Air Force RQ-4A Global Hawk Block 10 aircraft acquired by the Navy to provide interim support for U.S. Central Command operations and develop unmanned maritime surveillance tactics and doctrine. BAMS-D airframe design, aircraft systems, and sensor payloads differ significantly from the more advanced MQ-4C Triton system that will begin flight test in FY13. This mishap did not affect the MQ-4C Triton development and test program.

Assessment

- The MQ-4C program experienced a significant test schedule delay in 2012, primarily due to aircraft flight control computer software stability problems discovered during laboratory testing. These problems delayed first flight of the MQ-4C developmental test aircraft from May 2012 until at least January 2013. The revised program test schedule compresses developmental and operational test events and significantly increases schedule risk prior to the planned operational assessment in June 2013 and the Milestone C decision in October 2013. If developmental flight testing identifies any significant air vehicle, ground station, or mission system deficiencies, additional program schedule delays are possible.
- Following delivery of the first flight test air vehicle in June 2012, acceptance and ground testing proceeded

Recommendations

- Status of Previous Recommendations. This is the first annual report for this program.
- FY12 Recommendation.
 1. The Navy should fully implement the event-driven test and evaluation strategy outlined in the January 2012 TEMP to ensure that the program completes the previously approved system maturity demonstrations and operational assessments prior to a Milestone C LRIP decision. Given the reductions in developmental testing that are occurring, the operational assessment will be a key, critical source of information on the system's performance prior to the production decision.