

MQ-9 Reaper Armed Unmanned Aircraft System (UAS)

Executive Summary

- The MQ-9 Reaper Unmanned Aircraft System (UAS) continues to support ongoing global combat operations with primary programmatic focus on production and delivery of Remotely Piloted Aircraft (RPA) and incorporation of evolving and emergent sensor and system technologies outside of the MQ-9 baseline program of record.
- The MQ-9 program notified the Secretary of the Air Force of an Acquisition Program Baseline (APB) breach in May 2013 due to the inability to meet the program of record development schedule. Ongoing schedule challenges, combined with RPA production emphasis, increase the likelihood that the MQ-9 UAS will complete the delivery of planned RPAs under low-rate initial production.
- The program will not be able to execute the planned 2014 FOT&E of the final configuration of the Increment One system consisting of the Block 5 RPA, Block 30 Ground Control Station (GCS), and Operational Flight Program (OFP) 904.6 due to delays in software and technical order development.
- Ongoing developmental challenges delayed operational testing and subsequent fielding of enhanced baseline program capabilities to operational MQ-9 units in FY13 including OFP 904.2, and GBU-38 Joint Direct Attack Munition (JDAM). Challenges are likely to persist in the long-term and significantly delay the operational testing and fielding of the final configuration of the Increment One system.
- Air Force Air Combat Command (ACC) began a Force Development Evaluation (FDE) of OFP 904.2 in July 2013. Operational testing of this software OFP will continue through early FY14.

System

- The MQ-9 Reaper UAS is a remotely-piloted, armed, air vehicle that uses optical, infrared, and radar sensors to locate, identify, target, and attack ground targets.
 - The MQ-9 RPA is a medium-sized aircraft that has an operating ceiling up to 50,000 feet, an internal sensor payload of 800 pounds, an external payload of 3,000 pounds, and an endurance of approximately 14 hours.
 - The GCS commands the MQ-9 RPA for launch, recovery, and mission control of sensors and weapons. C-band line-of-sight datalinks are used for RPA launch and recovery operations, and Ku-band satellite links are used for RPA mission control.



- The MQ-9 RPA carries AGM-114, Hellfire II anti-armor precision laser-guided missiles and GBU-12, 500-pound laser guided bombs.
- The Air Force is using an evolutionary acquisition approach for meeting Increment One Capability Production Document (CPD) requirements, with Block 1 and Block 5 RPAs and Block 15 and Block 30 GCSs.
- The Air Force is currently fielding the Block 1 RPA and the Block 15 GCS.
- The Air Force designed the Block 5 RPA to incorporate improved main landing gear, an upgraded electrical system with more power, an additional ARC-210 radio, encrypted datalinks, a redesigned avionics bay and digital electronic engine control system, the BRU-71 bomb rack, high-definition video, and upgraded software to allow the two-person aircrew to operate all onboard systems.

Mission

- Combatant Commanders use the MQ-9 onboard sensors and weapons to conduct armed reconnaissance and pre-planned strikes. Units equipped with MQ-9s can find, fix, track, target, engage, and assess critical emerging targets (both moving and stationary).
- MQ-9 units can also conduct aerial intelligence gathering, reconnaissance, surveillance, and target acquisition for other airborne platforms.

Major Contractor

General Atomics Aeronautical Systems Inc. – San Diego, California

Activity

- The Air Force conducted MQ-9 testing in accordance with the DOT&E-approved Test and Evaluation Master Plan and test plan.
- The MQ-9 program notified the Secretary of the Air Force of an APB breach in May 2013 due to the inability to meet the program's development schedule. The program will not be able to execute the planned 2014 FOT&E due to delays in software and technical data development.
- ACC began the FDE of OFP 904.2 in July 2013 on the Block 1 RPA to test improvements to optical and infrared sensor target location accuracy, establish a baseline measurement of radar target location accuracy, and evaluate system user interface improvements. The FDE will continue into early FY14.
- Air Force Special Operations Command (AFSOC) executed a limited evaluation of OFP 904.4 in September 2013 in order to deliver a limited capability of encrypted high-definition full motion video transmission to remote video terminal-equipped ground units with Video Oriented Transceiver for Exchange of information. The Air Force completed risk reduction demonstration flights of the Block 5 RPA and Block 30 GCS in FY13; however, planned formal developmental testing did not begin as planned in FY13. Formal Block 5 RPA and Block 30 GCS developmental testing is projected to begin in early FY14.
- DOT&E rescinded the 2009 GBU-38 500-pound JDAM FDE plan in February 2013 due to lack of progress in maturing software capabilities to support an operational evaluation with the current MQ-9 OFPs. AFOTEC will test JDAM during FOT&E of the MQ-9 Increment One system.
- Significant programmatic and developmental delays caused by software maturity challenges, technical data development, and competing schedule priorities for non-program of record capabilities continued to delay the program test schedule.
- Development, operational testing, and fielding of Increment One program of record capabilities will likely experience continued delays until the program is able to better prioritize and control maturation of these capabilities in accordance with a predictable schedule. Ongoing schedule challenges, combined with RPA production emphasis, increase the likelihood that the MQ-9 UAS will complete the delivery of all planned MQ-9 RPAs under low-rate initial production. FOT&E of the Increment One UAS configuration, originally planned for 2013, will likely be delayed several years beyond FY14.
- The Air Force intends to fulfill the MQ-9 Increment One CPD requirements with a final UAS configuration consisting of the Block 5 RPA, Block 30 GCS, and OFP 904.6. AFOTEC will conduct formal operational testing of the final MQ-9 Increment One UAS. This operational testing will assess Increment One UAS effectiveness, suitability, mission capabilities, and satisfaction of CPD key performance parameters.
- AFSOC demonstrated the successful transmission of encrypted, high-definition full motion video from the RPA to remote video terminal-equipped ground units in support of urgent AFSOC capabilities needs. AFOTEC will conduct formal evaluation of full motion video transmission during FOT&E of the MQ-9 Increment One system.
- As has been the case since FY11, Information Assurance (IA) vulnerabilities and deficiencies are not well characterized because the Air Force has only completed limited IA testing on the MQ-9 system. Currently, the system is operating under an Interim Authority to Test, pending full system IA testing.

Assessment

- The MQ-9 program continues to face systemic challenges in prioritizing and maturing software OFPs and developing technical order data to meet development and fielding timelines for the MQ-9 Increment One program of record. The lack of a program Integrated Master Schedule to support the development of capabilities continues to exacerbate these difficulties. As in previous years, such challenges significantly extended the time to complete development of planned software upgrades (OFPs 904.2 and 904.4). The planned FY12 OFP 904.2 FDE test did not begin until late FY13. OFP 904.4 development delays led the Air Force to cancel planned operational testing and fielding within the ACC fleet, and defer incorporation of intended capabilities to future OFP 904.6.

Recommendations

- Status of Previous Recommendations. In FY13, the Air Force made progress toward, but did not satisfy, the FY12 recommendation to complete the development of the Increment One UAS hardware and software to support FOT&E of the Increment One system. The Air Force also did not satisfy the outstanding FY11 recommendations to complete the JDAM FDE and conduct IA testing.
- FY13 Recommendations. The Air Force should:
 1. Complete the MQ-9 Increment One UAS Integrated Master Schedule.
 2. Complete the development of the Increment One UAS hardware and software to support FOT&E of the Increment One system.
 3. Complete the development of the GBU-38 JDAM capability for MQ-9 and test it during the FDE or FOT&E.
 4. Complete IA vulnerability testing and correct or mitigate any deficiencies prior to FOT&E.