

## RQ-4B Global Hawk High-Altitude Long-Endurance Unmanned Aerial System (UAS)

### Executive Summary

- In February 2015, USD(AT&L) approved a multi-year, \$3.5 Billion upgrade and modernization development program to accomplish the following: correct previous capability shortfalls identified during the 2011 RQ-4B Block 30 IOT&E; address emerging component obsolescence problems; and significantly upgrade system sensor, ground station, and communication systems. The Air Force is currently developing a comprehensive program test strategy and Test and Evaluation Master Plan (TEMP) to guide development and testing for the extensive system architecture and capability upgrades included in the new program baseline and future modernization programs.
- The Air Force is currently planning to conduct RQ-4B Block 30/Airborne Signals Intelligence Payload (ASIP) FOT&E in conjunction with the initial phases of the RQ-4B modernization program in FY18. This test should include a complete re-evaluation of the RQ-4B Block 30 Signals Intelligence (SIGINT) mission capabilities with the ASIP sensor as well as an assessment of previously identified ground station, air vehicle, communication system, interoperability, and cybersecurity shortfalls.
- Following numerous developmental test delays, the RQ-4B Block 40/Multi Platform Radar Technology Insertion Program (MP-RTIP) IOT&E began in September 2015 and completed in December 2015. The Air Force conducted testing in accordance with the DOT&E-approved test plan.

### System

- The RQ-4B Global Hawk is a remotely-piloted, high altitude, long-endurance airborne Intelligence, Surveillance, and Reconnaissance (ISR) system that includes the Global Hawk unmanned air vehicle, various intelligence and communications relay mission payloads, and supporting command and control ground stations.
- The RQ-4B Global Hawk Block 30 system is equipped with a multi-intelligence payload that includes both the Enhanced Integrated Sensor Suite imagery intelligence payload and ASIP SIGINT sensor.
- The RQ-4B Block 40 system is equipped with the MP-RTIP synthetic aperture radar payload designed to simultaneously collect imagery intelligence on stationary ground targets and track ground-moving targets.
- All RQ-4B systems use line-of-sight and beyond-line-of-sight communication systems to provide air vehicle command and control and transfer collected intelligence data to ground stations for exploitation and dissemination.
- The Air Force Distributed Common Ground System (AF DCGS) supports ISR collection, processing, exploitation,



analysis, and dissemination for both Block 30 and 40 RQ-4B Global Hawk systems. The AF DCGS employs global communications architecture to connect multiple intelligence platforms and sensors to numerous Distributed Ground Stations where intelligence analysts produce and disseminate intelligence products.

### Mission

- Commanders use RQ-4 Global Hawk reconnaissance units to provide high-altitude, long-endurance intelligence collection capabilities to support theater operations.
- Operators collect imagery and SIGNINT data to support ground units and to identify intelligence-essential elements of information for theater commanders. Units equipped with RQ-4B Global Hawk use line-of-sight and beyond line-of-sight satellite datalinks to control the Global Hawk system and transmit collected intelligence data.
- Ground-based intelligence analysts exploit collected imagery, ground-moving target, and SIGINT to provide intelligence products that support theater operations.
- Global Hawk can also provide imagery intelligence directly to forward-based personnel through direct line-of-sight datalink systems.

### Major Contractor

Northrop Grumman Aerospace Systems, Strike and Surveillance Systems Division – San Diego, California

# FY15 AIR FORCE PROGRAMS

## Activity

- The 2015 Presidential Budget fully funded the Global Hawk program, resolving several years of programmatic uncertainty. As of September 2015, the Air Force has taken delivery of 18 of 21 RQ-4B Block 30 air vehicles and all 11 RQ-4B Block 40 air vehicles, along with 9 Mission Control and 10 Launch and Recovery ground stations.
- In February 2015, USD(AT&L) approved a multi-year, \$3.5 Billion upgrade and modernization development program to accomplish the following: correct previous capability shortfalls identified during the 2011 RQ-4B Block 30 IOT&E; address emerging component obsolescence problems; and significantly upgrade system sensor, ground station, and communication systems.
- The Air Force is currently developing a comprehensive program test strategy and TEMP to guide development and testing for the extensive system architecture and capability upgrades included in the new program baseline and future modernization programs.

### Block 30

- No RQ-4B Block 30 operational testing was conducted in FY15. The Air Force continued to sustain operations for 18 Block 30 aircraft at Beale AFB, California, and at forward operating bases in U.S. Pacific Command (USPACOM), U.S. Central Command (USCENTCOM), and U.S. European Command (USEUCOM) operating areas.
- The Air Force is currently developing a comprehensive program test strategy and TEMP to correct previously identified RQ-4B Block 30 capability shortfalls and test a series of other modernization upgrades. This strategy will identify the next collection of significant RQ-4B Block 30 FOT&E events planned for FY18. Events include re-evaluation of previously identified ASIP/SIGINT mission capability shortfalls, interoperability deficiencies, MS-177 sensor integration, weather radar performance, mission planning upgrades, and other system modernization changes.

### Block 40

- In FY15, the Air Force continued to employ two RQ-4B Block 40 development systems with limited operational capabilities in the USCENTCOM area of operations. Two additional systems are deployed in the USPACOM area of operations. These systems were fielded in FY13 and FY14 to support Combatant Command requests for additional airborne ISR support.
- Following numerous developmental test delays, the RQ-4B Block 40/MP-RTIP IOT&E began in September 2015, and completed in December 2015. The Air Force conducted testing in accordance with the DOT&E-approved test plan. Initial schedule delays were associated with synthetic aperture radar image quality problems and system stability problems observed during the FY13 RQ-4B Block 40 Operational Utility Evaluation (OUE). Delayed delivery of AF DCGS system software changes necessary to support RQ-4B Block 40 operations further delayed the start of IOT&E.
- DOT&E approved the Block 40 IOT&E test plan in May 2015.

## Assessment

### Block 30

- Since the combined RQ-4B Block 30/ASIP IOT&E in 2011, the Air Force has corrected most RQ-4B air vehicle reliability and availability problems and implemented a limited number of previously planned system improvements. However, due to the program uncertainty driven by the FY13 DOD decision to retire the RQ-4B fleet, and the subsequent reversal of that decision, the Air Force has not yet conducted a comprehensive FOT&E to verify correction of all major IOT&E deficiencies. Currently fielded RQ-4B Block 30 systems continue to operate with many of the same operational performance, interoperability, and SIGINT mission deficiencies identified during IOT&E.
- The Air Force is currently planning to conduct FOT&E in conjunction with the initial phases of the RQ-4B modernization program in FY18. This test should include a complete re-evaluation of the RQ-4B Block 30 SIGINT mission capabilities with the ASIP sensor as well as an assessment of previously identified ground station, air vehicle, communication system, interoperability, and cybersecurity shortfalls.

### Block 40

- Since the FY13 RQ-4B Block 40 OUE, the Air Force has implemented a series of software changes to improve MP-RTIP sensor stability and performance. Field data from USCENTCOM early fielding activities indicate that software changes and procedural workarounds have improved sensor stability.
- IOT&E began in September 2015 and included 10 sorties that concluded in October 2015; additional data collection and analysis continued until the end of December 2015.
- DOT&E intends to submit a report on the RQ-4B Block 40 IOT&E in 2QFY16.

## Recommendations

- Status of Previous Recommendations. The Air Force made limited progress toward addressing FY14 recommendations. The Air Force has not completed an RQ-4B Block 30 or RQ-4B Block 40 TEMP to guide developmental and operational testing of these systems or proceeded with an ASIP sensor FOT&E event to verify correction of performance deficiencies identified during the 2011 RQ-4B Block 30 IOT&E. The Air Force has identified and corrected some persistent RQ-4B Block 40/MP-RTIP sensor stability problems, but has not verified whether these corrections will provide enough improvement to correct the significant operational performance shortfalls that have been identified since the initial AFOTEC MP-RTIP operational assessment in 2008. The Air Force did implement corrective actions for the MP-RTIP synthetic aperture radar image resolution problems observed during the 2013 RQ-4B Block 40 OUE.

## FY15 AIR FORCE PROGRAMS

- FY15 Recommendations. The Air Force should:
  1. Develop an RQ-4B program TEMP to guide completion of post-IOT&E corrective actions and to define operational test requirements for future Block 30 and Block 40 system upgrades.
  2. Develop a plan to complete the FOT&E for the RQ-4B Block 30 SIGINT mission using the ASIP sensor.

# FY15 AIR FORCE PROGRAMS