

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

Executive Summary

Block 20

- The Air Force successfully completed conversion of two additional RQ-4B Block 20 air vehicles to the EQ-4B configuration equipped with the Battlefield Airborne Communications Node (BACN) payload. This increased the total number of BACN-equipped air vehicles supporting U.S. Central Command (USCENTCOM) operations to three. Developmental and operational testing of RQ-4B and EQ-4B Block 20 Global Hawk variants are complete.

Block 30

- The Air Force continued developmental testing of RQ-4B Block 30 capability upgrades and deficiency corrections at a reduced pace due to the FY13 budget proposal to terminate the program. The Air Force continued to improve RQ-4B Block availability by correcting air vehicle and sensor reliability problems and increasing the availability of spare parts.
- The Air Force has not conducted an RQ-4B Block 30 operational test to field deficiency corrections or previously planned new system capabilities to operational units since IOT&E in December 2010. Future plans for system development and testing depend upon final FY13 budget decisions.

Block 40

- The Air Force completed the initial phase of RQ-4B Block 40/Multi-Platform Radar Technology Insertion Program (MP-RTIP) radar system-level performance verification testing in July 2012, which demonstrated basic integration of the MP-RTIP radar with the Global Hawk air vehicle. This phase also focused on improving radar software stability, image quality, and moving target false alarm rates.
- In response to a USCENTCOM early operational need request, the Air Force is planning a limited operational utility evaluation in March 2013 to support early fielding of two developmental RQ-4B Block 40 systems to support USCENTCOM operations.

System

- The RQ-4 Global Hawk is a remotely-piloted, high-altitude, long-endurance airborne intelligence, surveillance, and reconnaissance 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 20 system is equipped with the Enhanced Integrated Sensor Suite (EISS) imagery intelligence payload. The EQ-4B Block 20 variant is equipped



with the BACN theater communications relay payload. The EISS sensor includes infrared, optical, and synthetic aperture radar sensors for collecting still imagery intelligence on ground targets. The BACN payload provides communications connectivity between geographically separated operational units.

- The RQ-4B Global Hawk Block 30 system is equipped with a multi-intelligence payload that includes both the EISS imagery intelligence payload and the Airborne Signals Intelligence Payload (ASIP) electronic signal collection sensor.
- The RQ-4B Global Hawk 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.

Mission

Commanders use RQ-4 Global Hawk reconnaissance units to provide high-altitude, long-endurance intelligence collection capabilities or theater communications relay capabilities to supported commanders.

- Operators collect imagery and signals data in order 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.
- Distributed intelligence processing, exploitation, and dissemination systems receive intelligence data directly from the air vehicle or from the Global Hawk ground station via intelligence data transmission systems.

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- Ground-based intelligence analysts exploit collected imagery and signals information to provide intelligence products in support of 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

Activity

Block 20

- In response to a USCENTCOM request, the Air Force successfully completed conversion of two additional RQ-4B Block 20 air vehicles to the EQ-4B configuration equipped with the BACN payload to support USCENTCOM operations. The Air Force completed testing, and deployed these modified systems to USCENTCOM in FY12.
- Three of the four operational EQ-4B Block 20 air vehicles are now supporting USCENTCOM operations with the BACN payload. The fourth aircraft is a RQ-4B test asset. Developmental and operational testing of this Global Hawk variant is complete.

Block 30

- Due to the FY13 budget proposal to terminate RQ-4B Block 30 production and retire all existing aircraft, USD(AT&L) deferred the planned RQ-4B Block 30 Full-Rate Production Decision from August 2011 until at least November 2012.
- The Air Force continued developmental testing of software improvements to correct operational deficiencies identified during the FY11 IOT&E. However, the Air Force did not complete planned RQ-4B Block 30 Force Development Evaluation follow-on operational testing in FY11 or FY12 to evaluate and field these improvements due to uncertainty resulting from the FY13 budget proposal to terminate the program. The Air Force continued to implement corrective actions to improve system reliability, availability, and maintainability for the RQ-4B Block 30 systems currently employed in USCENTCOM, U.S. Pacific Command, and U.S. European Command operational theaters.
- The Air Force continued planning for an RQ-4B Block 30 Force Development Evaluation operational test in FY13 to evaluate specific post-IOT&E air vehicle and sensor software upgrades and a new satellite communications link. Planning for a more comprehensive FY14 RQ-4B Block 30/ASIP FOT&E event to evaluate correction of all major system deficiencies identified during IOT&E remains on hold pending a final decision on the future of the RQ-4B Block 30 program.

Block 40

- Due to FY13 budget uncertainties, USD(AT&L) deferred the RQ-4B Global Hawk Block 40 Milestone C Decision from August 2011 until FY13.

- In preparation for a Milestone C decision, the Air Force is developing a revised RQ-4B Block 40 Capability Production Document for Joint Staff approval, which removes Battle Management Command and Control mission capabilities as a threshold requirement and lowers overall system reliability and availability requirements. The Air Force also initiated development of an RQ-4B Block 40 Milestone C Test and Evaluation Master Plan to guide system developmental and operational test activities leading to a combined RQ-4B Block 40/MP-RTIP IOT&E in FY14 and FOT&E of future capabilities and system improvements.
- The Air Force continued execution of the current RQ-4B Block 40/MP-RTIP development and test program. The Air Force completed the first phase of RQ-4B Block 40/MP-RTIP radar system-level performance verification testing in July 2012 to verify basic integration of the MP-RTIP radar with the air vehicle platform. Additional radar control, performance, and interoperability testing is in progress and will continue until IOT&E in FY14.
- In response to a USCENTCOM early operational need request, the Air Force is planning a limited operational utility evaluation in March 2013 to support early fielding of two developmental RQ-4B Block 40 systems to support USCENTCOM operations.
- Accelerated delivery of RQ-4B Block 40 air vehicles and MP-RTIP sensor systems continued in FY12. The Air Force will accept delivery of at least 9 of the 11 procured RQ-4B Block 40 systems at Grand Forks AFB, North Dakota, prior to IOT&E and initial operational capability in FY14.

Assessment

Block 20

- Correction of previously identified EQ-4B air vehicle reliability problems and procurement of additional spare parts increased the system reliability and availability.

Block 30

- Due to FY13 budget uncertainties and lack of planned follow-on operational testing, the Air Force has not fielded software deficiency corrections or previously planned additional capabilities to operational units. Future plans for system development and testing depend upon final FY13 budget decisions.

- The Air Force continued to improve RQ-4B Block 30 reliability and availability by correcting air vehicle and sensor reliability problems and increasing the availability of spare parts. Maintenance training and technical order improvements also improved system maintainability. As a result, RQ-4B Block 30 mission capable rates increased from approximately 52 percent during the FY11 IOT&E to over 80 percent in FY12. At these rates, RQ-4B Block 30 effective-time-on-station performance at near continuous operational tempos should be sufficient to meet the minimum 55 percent effective-time-on-station operational requirement for single vehicle operations, if sufficient spare parts remain available.

Block 40

- The RQ-4B Block 40 and MP-RTIP development program made significant progress in FY12. The initial phase of radar system-level performance verification test in July 2012 demonstrated basic integration of the MP-RTIP radar with the air vehicle. This phase also focused on improving radar software stability, image quality, and moving target false alarm rates
- The RQ-4B Block 40/MP-RTIP test schedule to support early fielding of two systems to USCENTCOM in May 2013 and the FY14 IOT&E is aggressive with little room for recovery if ongoing developmental tests discover any significant system performance problems. Ongoing sensor data transfer and interoperability challenges and potential winter weather delays at the Grand Forks, North Dakota, test site further increase schedule risks.

Recommendations

- **Status of Previous Recommendations.** The Air Force made progress in addressing previous DOT&E recommendations to implement RQ-4B Block 30 system reliability, interoperability, and Information Assurance improvements. The Air Force delayed full implementation of the ASIP sensor performance improvement plans and other post-IOT&E RQ-4B Block 30 improvements due to the FY13 budget proposal to terminate the program. The Air Force successfully addressed DOT&E recommendations to revise RQ-4B Block 40 operational capability requirements and define related end-to-end operational architectures and interoperability requirements.
- **FY12 Recommendations.** The Air Force should:
 1. Develop an RQ-4B Block 30 test strategy to complete post-IOT&E corrective actions and conduct a comprehensive FOT&E if the decision is made to continue the program. If terminated, the Air Force should conduct FOT&E of the ASIP sensor on the U-2 aircraft to verify correction of serious performance deficiencies identified during IOT&E.
 2. Conduct an operational test to support early fielding of RQ-4B Block 40 developmental systems to meet the FY13 USCENTCOM operational need request.
 3. Complete an RQ-4B Block 40 Test and Evaluation Master Plan to guide system test activities leading to a combined RQ-4B Block 40/MP-RTIP IOT&E in FY14 and the required follow-on developmental and operational testing of planned future Global Hawk capabilities and system improvements.

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