

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

Executive Summary

Block 30

- Since the RQ-4B Block 30 IOT&E in 2011, which also served as the IOT&E event for the Airborne Signals Intelligence Payload (ASIP) program, 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 decision to retire this system, the Air Force reduced developmental test activities and has not conducted a comprehensive FOT&E to verify correction of all major IOT&E deficiencies. As a result, currently fielded RQ-4B Block 30 systems continue to operate with some operational performance and ASIP signals intelligence (SIGINT) mission deficiencies identified during IOT&E. Current program plans call for limiting future test activity to the minimum necessary to sustain and support fielded systems.
- The Air Force has not completed all ASIP corrective action plans or conducted follow-on operational testing to verify improved ASIP SIGINT mission capabilities. No formal plan to re-evaluate documented ASIP system performance deficiencies has been established, even though the Air Force continues to acquire and field additional ASIP production units. The Air Force is currently re-evaluating options to conduct ASIP FOT&E on either the RQ-4B Block 30 or the U-2 Dragon Lady.

Block 40

- In August 2013, DOT&E published the RQ-4B Block 40/Multi-Platform Radar Technology Insertion Program (MP-RTIP) Early Fielding Report that provided an assessment of system capability to support U.S. Central Command (USCENTCOM) early fielding requirements for surveillance of vehicle ground moving targets. This report concluded that RQ-4B Block 40/MP-RTIP early operational capabilities are limited, but adequate to provide additional near real-time vehicle ground moving target capabilities necessary to support the USCENTCOM early fielding concept of employment. The Air Force deployed two RQ-4B Block 40 systems to the USCENTCOM operating area in September 2013.
- Based on operational testing conducted to support early fielding, the RQ-4B Block 40 system provides an effective vehicle moving target and detection capability at short to medium ranges. The system is interoperable with interim USCENTCOM command and control networks and target data dissemination architecture. For early fielding operations, operational units are capable of generating long-endurance sorties at the planned operational tempo of



two to three sorties per week using two aircraft. However, contractor maintenance and supply support is required to compensate for immature system-level reliability, maintenance training, documentation, and logistics support systems.

- Although not required for USCENTCOM early fielding, early operational test results indicate that RQ-4B Block 40/MP-RTIP synthetic aperture radar (SAR) stationary target imagery capabilities are immature and do not currently meet established operational requirement thresholds for image resolution. MP-RTIP operator displays and control interfaces are also immature, which significantly increases operator workload during target-intense operations. During operational testing, frequent MP-RTIP sensor faults required sensor operators to halt intelligence collection operations to reset or restart the system. Resulting sensor downtime reduced on-station intelligence collection time by 23 percent. The demonstrated sensor availability rate of 77 percent falls short of the 90 percent availability expected at system maturity. The Air Force is conducting additional development and test activities to improve performance in these areas prior to the planned FY14 IOT&E.

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

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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 (EISS) imagery intelligence payload and the ASIP signals intelligence sensor.
- The RQ-4B Global Hawk Block 40 system is equipped with the MP-RTIP SAR 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.
- 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

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- Since RQ-4B Block 30 IOT&E completion and initial fielding in 2011, the Air Force has implemented some minor system upgrades and deficiency corrections.
 - In March 2013, the Air Force completed a limited force development evaluation to support fielding of previously planned air vehicle and sensor upgrades and a new satellite communications link.
 - Due to the decision to retire the RQ-4B Block 30 system, the Air Force halted planning for a comprehensive RQ-4B Block 30 FOT&E intended to evaluate correction of all major RQ-4B and ASIP SIGINT mission capability shortfalls identified during IOT&E.
- The Air Force is continuing to acquire and pursue upgrade programs for the ASIP sensor. In addition, the Air Force is planning to modify some RQ-4B Block 30 ASIP sensors for transfer and deployment on the U-2 Dragon Lady in FY14.

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- The Air Force continued to execute the RQ-4B Block 40/MP-RTIP test program leading to a projected Initial Operational Capability in FY15. In FY13, the program successfully completed initial MP-RTIP sensor integration and performance developmental testing. Additional performance and interoperability testing will continue into FY14. Planning is in progress for the RQ-4B Block 40/MP-RTIP IOT&E event in 4QFY14. Based on current production and delivery schedules, the Air Force will deliver all 11 RQ-4B Global Hawk Block 40 systems to Grand Forks AFB, North Dakota, prior to IOT&E.
- In response to a USCENTCOM urgent operational need request, the Air Force accelerated the fielding of two RQ-4B Block 40/MP-RTIP aircraft to provide additional surveillance and tracking capabilities for vehicle ground moving targets. In March 2013, the Air Force Operational

Test and Evaluation Center (AFOTEC) conducted a DOT&E-approved RQ-4B Global Hawk Block 40 Operational Utility Evaluation (OUE) to evaluate early system capabilities for this purpose. DOT&E and AFOTEC published RQ-4B Global Hawk Block 40 Early Fielding Reports based on this test in August 2013. The Air Force deployed two aircraft to support USCENTCOM operations in September 2013.

- Due to continuing uncertainty regarding the future of the RQ-4B program, USD(AT&L) again deferred the originally planned June 2011 RQ-4B Global Hawk Block 40 Milestone C decision to FY14 and the Joint Staff did not proceed with approval of the RQ-4B Block 40 Capabilities Production Document (CPD). As a result, the Air Force deferred completion of a program Test and Evaluation Master Plan intended to define the RQ-4B Block 40/MP-RTIP developmental and operational test and evaluation strategy.

Assessment

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- Since the combined RQ-4B Block 30 IOT&E and ASIP IOT&E event 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 decision to retire this system, the Air Force reduced developmental test activities and has not conducted a comprehensive developmental test and FOT&E to verify correction of all major deficiencies identified during the 2011 IOT&E. As a result, fielded RQ-4B Block 30 systems continue to operate with some operational performance and ASIP SIGINT mission deficiencies identified during IOT&E. Current program plans call for limiting future RQ-4B Block 30 test

activity to the minimum necessary to sustain and support fielded systems. No additional RQ-4B Block 30 follow-on operational testing is currently planned.

- The Air Force has not completed all post-IOT&E ASIP corrective action plans or conducted follow-on operational testing to verify improved ASIP SIGINT mission capabilities. No formal plan to re-evaluate previously identified ASIP system performance deficiencies has been established, even though the Air Force continues to acquire and field additional ASIP production units and pursue incremental system upgrades. The Air Force is currently re-evaluating options to conduct the required ASIP SIGINT mission FOT&E on either the RQ-4B Block 30 or the U-2 Dragon Lady. Conducting ASIP FOT&E on the U-2 may be a viable option since the Air Force is planning to transfer additional RQ-4B Block 30 ASIP sensors to the U-2 platform.

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- In August 2013, DOT&E published the RQ-4B Block 40/MP-RTIP Early Fielding Report based on test results from the RQ-4B Block 40 OUE. This report provided an assessment of system capability to support USCENTCOM early fielding requirements for surveillance of vehicle ground moving targets and an in-progress assessment of system progress toward full maturity and IOT&E readiness. The Air Force deployed two RQ-4B Block 40 systems to the USCENTCOM operating area in September 2013.
- Based on the March 2013 OUE results, RQ-4B Block 40/MP-RTIP early operational capabilities are limited, but adequate to provide additional near real-time vehicle ground moving target capabilities necessary to support the USCENTCOM early fielding concept of employment.
 - The system provides an effective vehicle ground moving target and detection capability at short to medium ranges.
 - RQ-4B Block 40 air vehicle and ground station performance is similar to previously fielded RQ-4B Block 30 systems and compatible with the planned USCENTCOM operating environment.
 - Air vehicle long endurance flight capabilities exceed 30 hours.
 - Adverse weather operations remain limited due to a lack of anti-ice/de-icing systems and real-time severe weather detection and avoidance capabilities.
 - The system is interoperable with interim USCENTCOM command and control networks and target data dissemination architecture.
 - For early fielding operations, operational units are capable of generating long-endurance sorties at the planned operational tempo of two to three sorties per week using two aircraft. However, contractor

maintenance and supply support is required to compensate for immature system-level reliability, maintenance training, documentation, and logistics support systems.

- Although not required for USCENTCOM early fielding, the March 2013 OUE results indicate that RQ-4B Block 40/MP-RTIP SAR stationary target imagery capabilities are immature and do not currently meet established operational requirement thresholds for image resolution. MP-RTIP operator control interfaces, sensor stability, and sensor reliability are also immature. During OUE missions, frequent MP-RTIP sensor faults required sensor operators to halt intelligence collection operations to reset or restart the system. Resulting sensor downtime reduced on-station intelligence collection time by 23 percent. The demonstrated sensor availability rate of 77 percent falls short of the 90 percent availability expected at system maturity. Sensor stability problems, combined with identified sensor control and interface deficiencies, significantly increase operator workload in target-dense operating environments. The Air Force is conducting additional development and test activities to improve performance in these areas prior to the planned FY14 IOT&E.

Recommendations

- Status of Previous Recommendations. The Air Force conducted an operational test to support early fielding of the RQ-4B Block 40 systems to support USCENTCOM operational requirement. Due to the decision to retire the RQ-4B Block 30 system, the Air Force did not address the following previous recommendations.
 1. Develop or implement a comprehensive development and FOT&E strategy to complete correction of RQ-4B Block 30 system deficiencies.
 2. Establish a plan to conduct an ASIP sensor FOT&E on either the RQ-4B Block 30 or U-2 to verify correction of ASIP SIGINT operational capability deficiencies identified during IOT&E.
 3. Complete an RQ-4B Block 40 Test and Evaluation Master Plan to guide developmental and operational testing of this system.
- FY13 Recommendations. The Air Force should:
 1. Plan and conduct an RQ-4B Block 40/MP-RTIP IOT&E event to evaluate delivered mission capabilities.
 2. Identify and correct persistent RQ-4B Block 40/MP-RTIP sensor stability problems. Operational and developmental testing has consistently identified sensor instability as a significant operational performance shortfall since the initial AFOTEC MP-RTIP Operational Assessment in 2008.
 3. Identify and correct RQ-4B Block 40/MP-RTIP SAR image resolution performance prior to IOT&E.

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