

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

Executive Summary

The Air Force Operational Test and Evaluation Center (AFOTEC) originally planned to execute an Operational Utility Evaluation (OUE) on the RQ-4B Block 30 Global Hawk Multi-Spectral (MS) – 177 system in mid-2017. However, delays to the start of the OUE occurred due to problems with weather radar testing, technical order development, and a software deficiency on a new software build that had the potential to result in loss of RQ-4B Global Hawk aircraft control while in flight. The program resolved the weather radar testing problems and completed technical order development in September 2018. Northrop Grumman modified software code to address the software deficiency and completed testing in October 2018. The OUE is planned to begin March 2019 and conclude in spring 2019.

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 Airborne Signals Intelligence Payload sensor. The Air Force has retrofitted two Block 30 aircraft with the MS-177 sensor to provide high resolution MS imaging capability with accurate and automatic geolocation capabilities at high stand-off ranges.
- All RQ-4B systems use line-of-sight and beyond line-of-sight communication systems to provide air vehicle command and control and to 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 the Block 30 Global Hawk



- system. The AF DCGS employs global communications architecture to connect multiple intelligence platforms and sensors to numerous DCGS installations where intelligence analysts produce and disseminate intelligence products.
- The Air Force has taken delivery of all 21 RQ-4B Block 30 air vehicles along with 9 Mission Control and 10 Launch and Recovery ground stations. Each Launch and Recovery ground station controls one air vehicle. The Air Force does not intend to procure any additional Mission Control or Launch and Recovery ground stations.

Mission

Commanders use RQ-4B Global Hawk reconnaissance units to provide high-altitude, long-endurance intelligence collection capabilities to support theater operations.

Major Contractor

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

Activity

- AFOTEC originally planned to execute an OUE on the RQ-4B Block 30 Global Hawk MS-177 system in mid-2017. However, delays to the start of the OUE occurred due to problems with weather radar testing, technical order development, and a software deficiency on a new software build that occurred during ground testing of the RQ-4B Global Hawk Battlefield Airborne Control Network (BACN) aircraft.

The software deficiency could result in loss of RQ-4B Global Hawk aircraft control while in flight. This same software is utilized for the RQ-4B Global Hawk MS-177 aircraft. The program completed technical order development in September 2018.

- Northrop Grumman modified the software code to address the software deficiency. The 53rd Test and Evaluation Group,

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Detachment 2 observed system integration laboratory testing and developmental ground and flight tests in October 2018, and witnessed that the software deficiency, which could cause loss of aircraft control, was mitigated by the new software code.

- The program addressed three weather radar deficiencies associated with the KVM switch that were identified by the 53rd Test and Evaluation Group, Detachment 2 while conducting a Force Development Evaluation from July through August 2017. The program accomplished the following:
 - Relocated the switch to facilitate pilot access.
 - Modified the switch button logic, due to the need for pilots to display the weather radar information while manipulating the SIPRNET functions simultaneously.
 - Moved switch power access to reduce time required for operators and maintenance to recycle power when necessary.

- The OUE is planned to begin in March 2019 and conclude in spring 2019.

Assessment

- The 53rd Test and Evaluation Group, Detachment 2 validated the KVM switch modifications as adequate in March 2018. DOT&E concurs with this assessment.
- The 53rd Test and Evaluation Group, Detachment 2 validated the adequacy of the software modification addressing the potential loss of aircraft control deficiency as adequate in October 2018. DOT&E concurs with this assessment.

Recommendation

1. The Air Force should conduct operational testing of the MS-177 system to evaluate operational effectiveness, suitability, and mission capability