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

Executive Summary

- The Air Force Operational Test and Evaluation Center (AFOTEC) conducted the Operational Utility Evaluation (OUE) for the RQ-4B Global Hawk Block 30 Multi-Spectral (MS) – 177 from June through November 2019. Based on preliminary analysis, the system demonstrated the capability to provide electro-optical (EO) and infrared (IR) imagery data. The sensor can support long-endurance missions necessary to support operations at a peacetime or a non-crisis operational tempo. Although the system did not meet all of the joint interoperability requirements, it did not significantly degrade mission effectiveness.
- The Air Force conducted a Cooperative Vulnerability and Penetration Assessment (CVPA) in conjunction with the OUE. It identified vulnerabilities that will be documented in the classified DOT&E OUE report. The report is expected to be available March 2020.

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 (E-ISS) imagery intelligence payload and Airborne Signals Intelligence Payload (ASIP) sensor. The Air Force has retrofitted two Block 30 aircraft with the 7-band MS-177 sensor, in-place of the E-ISS to provide high resolution MS imaging capability with accurate and automatic geolocation capabilities at high stand-off ranges.
- The RQ-4B Block 30 MS Intelligence program replaces the E-ISS with a 10-band multi-spectral sensor referred to as MS-177A while retaining the ability to operate ASIP concurrently. The MS-177A sensor is capable of generating multi-spectral images that combine the expanded visible and IR ranges to provide a unique and highly exploitable form of intelligence. The Air Force is conducting an early fielding of two 7-band multi-spectral sensors, known as MS-177, to enhance immediate capabilities and serve as a risk reduction

Multi-Spectral (MS)-177 Sensor

exercise for the development and fielding of the full 10-band sensor.

- The RQ-4B Block 30 MS Intelligence program added the Goshawk network and Swift Broadband to the Global Hawk system. The Goshawk network is a new way to utilize the Ku Satellite system and operators use the network for aircraft and sensor command and control, as well as imagery and signal dissemination. The new Swift Broadband assists operators with weather radar activities and adds an additional air traffic control voice communication path.
- The Air Force – Distributed Common Ground System (AF DCGS) supports ISR collection, processing, exploitation, analysis, and dissemination for the Global Hawk Block 30 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.

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 conducted the RQ-4B Global Hawk Block 30 MS-177 OUE from June through September 2019. AFOTEC conducted most of the testing in accordance with

the DOT&E-approved test plan. However, due to attempting to remain on the Air Combat Command (ACC) early fielding schedule, AFOTEC did not accomplish all of the imagery

testing documented in the test plan. DOT&E is analyzing the OUE test data and intends to produce a classified report in March 2020.
- ACC plans to field two aircraft with the MS-177 sensor installed to support Combatant Command operations in 2QFY20.
- AFOTEC conducted the CVPA in conjunction with the OUE. The vulnerabilities identified in the CVPA will be documented in the classified DOT&E OUE report.

Assessment
- Based on preliminary analysis, the system demonstrated the capability to provide EO and IR imagery data. The sensor can support long-endurance missions necessary to support operations at a peacetime or a non-crisis operational tempo. Although the system did not meet all of the joint interoperability requirements, it did not significantly degrade mission effectiveness.
- Implementation of the Goshawk network architecture and Swift Broadband added system complexity that resulted in increased datalink outages.
- Any datalink bandwidth restrictions may result in the system not being suitable for some sensor modes, such as persistent imaging.

Recommendation
1. The Air Force should correct RQ-4B Global Hawk Block 30 MS-177 sensor vulnerabilities discovered during the OUE to improve system survivability.