

MQ-4C Triton Unmanned Aircraft System (UAS)

Executive Summary

- The Navy began an operational assessment (OA) of the MQ-4C Triton Unmanned Aircraft System (UAS) in November 2015 in support of a planned 2QFY16 Milestone C decision. The OA is anticipated to complete in 1QFY16. DOT&E will submit a classified OA report in 3QFY16.
- Developmental flight testing of the MQ-4C with integrated mission systems and the Integrated Functional Capability (IFC) 2.2 software began in April 2015, following a delay due to a lag in development of IFC 2.2. Poor system stability and defect discovery consistent with early developmental testing slowed the progress of developmental testing of the mission systems. The delay in the development of IFC 2.2 and the slower than anticipated pace of IFC 2.2 developmental testing postponed the start of the OA.
- The program continues to pursue a solution providing traffic de-confliction and collision avoidance capability (“due regard”) since stopping the development of the Air-to-Air Radar Subsystem. The program intends to select a technical solution in FY16 for delivery after Initial Operational Capability (IOC). The Navy is investigating alternative means of due regard compliance including procedures and other cooperative avoidance systems already integrated in the MQ-4C in order to support Triton operations at IOC.

System

- The MQ-4C Triton UAS is an Intelligence, Surveillance, and Reconnaissance system-of-systems consisting of the high-altitude, long endurance MQ-4C air vehicle, sensor payloads, and supporting ground control stations. The MQ-4C system is a part of the Navy Maritime Patrol and Reconnaissance family-of-systems and will provide multiple types of surveillance data over vast tracks of ocean and littoral areas; overland Intelligence, Surveillance, and Reconnaissance; signals intelligence and target acquisition capabilities designed to complement the P-8A Poseidon Multi-mission Maritime Patrol aircraft.
- The MQ-4C air vehicle design is based on the Air Force RQ-4B Global Hawk air vehicle with significant modifications that include strengthened wing structures and an anti-ice and de-icing system.
- Mission systems include a maritime surveillance radar to detect, identify, and track surface targets and produce high-resolution imagery.
 - An electro optical/infrared sensor provides full motion video and still imagery of surface targets and the electronic



support measures system detects, identifies, and geolocates radar threat signals.

- An Automatic Identification System (AIS) receiver permits the detection, identification, geolocation, and tracking of cooperative maritime vessels equipped with AIS transponders.
- Planned future system upgrades include an air traffic collision avoidance radar system and a signals intelligence collection system. Onboard line-of-sight and beyond line-of-sight datalink and transfer systems provide air vehicle command and control and transmit sensor data from the air vehicle to ground control stations for dissemination to fleet tactical operation centers and intelligence exploitation sites.

Mission

- Commanders use units equipped with MQ-4C to conduct long endurance maritime surveillance operations and provide high- and medium-altitude intelligence collection.
 - MQ-4C operators will detect, identify, track, and assess maritime and littoral targets of interest and collect imagery and signals intelligence information.
 - Operators disseminate sensor data to fleet units to support a wide range of maritime missions to include surface warfare, intelligence operations, strike warfare, maritime interdiction, amphibious warfare, homeland defense, and search and rescue.

Major Contractor

Northrop Grumman Aerospace Systems, Battle Management and Engagement Systems Division – Rancho Bernardo, California

FY15 NAVY PROGRAMS

Activity

- Developmental flight testing of the MQ-4C with integrated mission systems and IFC 2.2 began in April 2015. Poor system stability and defect discovery consistent with early developmental testing slowed the progress of developmental testing of the mission systems and delayed the start of the OA.
- The Navy began an OA of the MQ-4C in November 2015, in support of a planned 2QFY16, Milestone C decision. The OA is anticipated to complete in 1QFY16. DOT&E will submit a classified OA report in 3QFY16.
- The program continues to pursue a solution providing traffic de-confliction and collision avoidance capability since development of the Air-to-Air Radar Subsystem was stopped. The program intends to select a technical solution in FY16 for delivery after IOC. The Navy is investigating alternative means of due regard compliance including procedures and other cooperative avoidance systems already integrated in the MQ-4C in order to support MQ-4C operations at IOC.
- Since the MQ-4C is not yet authorized to operate on Navy operational networks, the Navy did not accomplish a cybersecurity Cooperative Vulnerability and Penetration Assessment (CVPA) of the MQ-4C during the OA.

Assessment

- Traffic de-confliction and collision avoidance provide critical mission capability for operation of the MQ-4C in civil and international airspace in support of global naval operations. Any limitation to this capability at IOT&E will reduce the effectiveness of the MQ-4C.
- When Triton can operate on operational networks, the Navy should accomplish a CVPA to allow the program to determine any cybersecurity vulnerabilities in the system.

Recommendations

- Status of Previous Recommendations. The Navy began the planned OA in FY15 and intends to demonstrate the tactics and procedures necessary that will enable Triton to descend to low and medium altitude.
- FY15 Recommendations. The Navy should:
 1. Demonstrate any alternative means of compliance with the due regard requirement during developmental testing under operationally realistic conditions prior to IOT&E.
 2. Conduct a CVPA sufficiently in advance of the Adversarial Assessment during IOT&E to allow the program to correct any discovered vulnerabilities.