

QF-16 Full-Scale Aerial Target (FSAT)

Executive Summary

- The Air Force completed QF-16 radar cross section (RCS) measurements in FY16.
- The Air Force has not accomplished cybersecurity testing in accordance with the DOT&E IOT&E recommendation and cybersecurity policy memorandum, dated August 1, 2014.
- The Air Force should continue, as it did in FY16 and FY17, to provide procurement funding for at least 25 Full-Scale Aerial Targets (FSATs) per year to meet Service-coordinated aerial target requirements, in compliance with Resource Management Decision 700.
- The Air Force should support the OSD-sponsored study to address shortfalls in testing against fifth-generation airborne threats, and be prepared to fund and implement the recommendations that are assigned for Air Force execution.



System

- The QF-16 is the latest FSAT designed to test and evaluate U.S. weapon systems and assist in developing tactics, techniques, and procedures to counter fighter-size airborne threats. The DOD is replacing the current FSAT, the QF-4, due to its increasing dissimilarity from current and projected air-superiority threats, declining supportability, and depletion of suitable F-4 airframes.
- The QF-16 system is composed of regenerated F-16 Block 15, 25, and 30 aircraft equipped with Drone-Peculiar Equipment to enable remote command and control, missile trajectory scoring, and safe flight termination. Like the QF-4, the QF-16 is capable of manned and Not Under Live Local Operator flight operations. It will operate from Tyndall AFB, Florida, using the Gulf Range Drone Control System, and Holloman AFB, New Mexico, using the White Sands Integrated Target System located at White Sands Missile Range, New Mexico.

- The QF-16 retains F-16 flight performance characteristics and payload capabilities including supersonic, after-burning engine, high-G maneuvering, complex electronic attack, and expendable countermeasures.

Mission

The DOD uses FSATs to:

- Provide threat-representative presentations for developmental and operational test and evaluation for U.S. weapon systems, as mandated by section 2366, title 10 U.S. Code.
- Continuously evaluate fielded air-to-air missile capabilities while providing live missile training for combat air crews through Air Force and Navy Weapon Systems Evaluation Programs.

Major Contractor

The Boeing Company – St. Louis, Missouri

Activity

- The Air Force completed RCS measurements in FY16 and demonstrated that the QF-16 meets the Capability Development Document requirements.
- The Air Force Life Cycle Management Center, with the support of the Air Force Operational Test and Evaluation Center, is in the process of test planning to comply with DOT&E cybersecurity testing requirements.

Assessment

- The QF-16 program currently lacks Air Force funding to complete additional cybersecurity testing. Using current program funding, the Air Force Life Cycle Management Center awarded a contract to Boeing to continue cybersecurity test planning in accordance with DOT&E guidance.

- The Air Force did not require QF-16 to represent fifth generation airborne threat systems (including radio frequency low-observability characteristics, internally-carried advanced electronic attack, and low probability of intercept sensors). DOT&E continues to emphasize that existing aerial targets, including the QF-16, are insufficient for adequate operational testing of U.S. weapon systems. Air Force RCS measurements show that QF-16 can only partially satisfy the test requirements for fifth generation full-scale targets.
 - In the Air Superiority Target Phase I Analysis of Alternatives Final Report (March 15, 2007), the Air Force recommended further study to produce user consensus on critical characteristics of future aerial targets and

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to determine capabilities and shortfalls in existing test resources.

- Multiple stakeholders within Congress, OSD, the Air Force, and the Navy, support the requirement for a fifth generation FSAT. OSD is leading a study to assess both short- and long-term fifth generation FSAT options, with a scheduled completion of March 2017.
- Vector Scoring System (VSS) reliability was noted as a problem in the 2015 QF-16 IOT&E report. The Air Force continues to monitor VSS reliability. The VSS hardware changes made for production aircraft, along with checkout and maintenance procedure updates, have shown improvement in VSS reliability. Additional data collection is ongoing to fully assess if the system will support compliance with the QF-16's Mean Time Between Failure requirement.
- In late June 2015, Boeing performed sample inspections on a QF-16 at Cecil Field, Florida, and discovered workmanship deficiencies with wire splices, termination, and routing. As a result of these findings, they broadened the inspection population to the first three production aircraft already delivered to Tyndall AFB, Florida, and found similar problems. Corrective actions were completed and the Program Office

received clearance in FY16 to provide full QF-16 services. Air Combat Command declared QF-16 Initial Operational Capability at Tyndall AFB, Florida, in September 2016, with a total of 15 QF-16s available for target operations.

Recommendations

- Status of Previous Recommendations. The Air Force completed RCS measurements in FY16 and has continued to monitor and improve VSS reliability. The Air Force still needs to address the recommendations to accomplish cybersecurity testing in accordance with the DOT&E cybersecurity policy memorandum, dated August 1, 2014.
- FY16 Recommendations. The Air Force should:
 1. Support the OSD-sponsored study to address shortfalls in testing against fifth-generation airborne threats, and be prepared to fund and implement the recommendations that are assigned for Air Force execution.
 2. Continue to monitor VSS reliability to ensure the corrections that were implemented in production aircraft will support compliance with the QF-16's Mean Time Between Failure requirement.