

QF-16 Full-Scale Aerial Target (FSAT)

Executive Summary

- The Air Force executed 99 QF-16 developmental and operational test sorties in FY13 and 14, completing IOT&E in September 2014.
- The QF-16 demonstrated progress toward mission effectiveness and suitability as a fourth-generation Full-Scale Aerial Target (FSAT) to support test, evaluation, and training of U.S. weapon systems at the Eglin Gulf Test and Training Range, Florida, and White Sands Missile Range, New Mexico.
- The Air Force should complete QF-16 radar cross section measurements and ensure procurement funding provides at least 25 FSAT targets per year beginning in FY16 to meet Service-coordinated aerial target requirements, in compliance with Resource Management Decision 700.
- The Air Force should provide plans for Phase II of the Air Superiority Target program to address shortfalls in testing against fifth-generation airborne threats.

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 (NULLO) 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 engines, 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 Title 10 U.S. Code, Section 2366
- 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

- QF-16 completed its last IOT&E flight on September 5, 2014. In total, QF-16 flew 99 developmental and operational test sorties, 19 of which were integrated test, and 4 dedicated operational test sorties (2 manned and 2 NULLO).
- The QF-16 program met Milestone C in October 2013 after nine months of developmental and integrated testing with the Eglin Gulf Test and Training Range at Tyndall AFB and Cecil Field in Florida.
- The QF-16 program relocated to Holloman AFB, New Mexico, to conduct developmental, integrated, and operational

testing, including integration with the White Sands Integrated Target Control System.

- On May 8, 2014, the Program Executive Officer convened the Operational Test Readiness Review and certified QF-16 to begin IOT&E.
- QF-16 completed its first of two operational test flights in the NULLO configuration on June 25, 2014, at Holloman AFB. Mission events included testing of the Vector Scoring System utilizing the Center for Countermeasures at White Sands Missile Range and two surface-to-air missiles.

FY14 AIR FORCE PROGRAMS

- The final operational test NULLO flight occurred on September 5, 2014, in conjunction with an AIM-9X Block II operational test live missile shot, which provided a realistic test of the QF-16 Vector Scoring System.
- The program scheduled the QF-16 Full-Rate Production decision for 2QFY15 with first delivery to the 82d Aerial Targets Squadron, Tyndall AFB, at the end of February 2015. The Air Force plans to achieve Initial Operational Capability at Tyndall AFB in 1QFY16.
- The Air Force conducted the IOT&E in accordance with the DOT&E-approved Test and Evaluation Master Plan.

Assessment

- QF-16 has demonstrated progress to provide an FSAT representing fourth-generation airborne threats for U.S. weapon systems testing. Analysis and reporting of IOT&E is incomplete but will conclude in 2QFY15; in particular, fixes to the Vector Scoring System that were identified in developmental testing remain to be verified.
- QF-16 has demonstrated progress in suitability metrics under the current Air Force concept of operations that generates a primary and backup FSAT for each chargeable scheduled sortie to achieve a 95 percent threshold supportability rating (defined as the ability to successfully launch in support of a scheduled test event). The Drone-Peculiar Equipment operating time totaled 776.6 hours with 25 failures, resulting in a 31.1-hour Mean Time Between Failure, below the Capabilities Development Document threshold requirement of 45 hours. The Army Materiel Systems Analysis Activity Maturity Project Model predicts QF-16 will reach 31.2 hours by Full Operational Capability in FY17.
- 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 existing aerial targets, including the QF-16, are insufficient for adequate operational testing of U.S. weapon systems.

- 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 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.

Recommendations

- Status of Previous Recommendations. This is the first annual report for this program.
- FY14 Recommendations. The Air Force should:
 1. Complete radar cross section measurements for QF-16 to ensure current and future U.S. weapon systems programs have precise, reliable data on system performance against measured, low-observable target presentations.
 2. Ensure QF-16 procurement funding continues to comply with Resource Memorandum Decision 700-mandated levels of 25 aircraft per year beginning in FY16, in order to meet Service-coordinated and approved test and training resource requirements.
 3. Complete the user requirements and current capabilities studies and provide plans for Phase II of the Air Superiority Target program to address test and evaluation shortfalls for U.S. weapon systems with respect to threat-representative, fifth-generation FSATs.