F-15EX Eagle II

The F-15EX Eagle II was approved for full-rate production (FRP) in June 2024. The Air Force is developing a plan for FOT&E based on DOT&E recommendations in the November 2023 combined IOT&E and LFT&E report. The Air Force completed cyber survivability testing on a Lot 1B aircraft and is developing a plan to assess a Lot 2 aircraft. The cyber survivability evaluation will continue with Lot 2 aircraft due to planned changes in the fielding configuration and will be included in the FOT&E. DOT&E is currently analyzing the results of the survivability studies and will submit an annex to the November 2023 combined IOT&E and LFT&E report in 2QFY25.

SYSTEM DESCRIPTION

The F-15EX is a two-seat, twin-engine, multi-role fighter aircraft. It is a derivative of the Qatari F-15QA, which is a derivative of the Air Force F-15E Strike Eagle. The F-15EX inherits modern advances such as "fly-by-wire" flight controls, dual Digital Helmet Mounted Cueing Systems, a large touchscreen display, and additional improvements, such as the AN/ALQ-250(V)1 Eagle Passive Active Warning Survivability System for electronic warfare, which is being reported on in a separate annual report article.

MISSION

Although the aircraft is multi-role capable, the Air Force intends to use the F-15EX initially in an air superiority role, then expand to a multi-role mission. Units equipped with the F-15EX will provide offensive counterair, cruise-missile defense, and defensive counter-air capabilities, including escort of high-value airborne assets. The F-15EX can employ a full complement of air-to-air weapons and has four additional air-to-air weapons stations compared to the F-15E. The F-15EX has a limited capability to employ precision-guided, air-to-surface munitions, in addition to its primary air superiority mission.

PROGRAM

The F-15EX is an Acquisition Category IB program that transitioned from a rapid fielding Middle Tier of Acquisition program to a major capability acquisition program in September 2022. The Air Force intends to procure 98 F-15EX aircraft, training systems, and support equipment over 6 procurement lots. As part of the transition process, DOT&E approved the OT&E section of the Program Strategy Document in October 2022. DOT&E published the F-15EX combined IOT&E and LFT&E report with classified annex in November 2023 to support the program's FRP decision in June 2024. The live fire data collection and analysis was incomplete in the LFT&E portion of the November 2023 report. After the data collection and analysis are complete, DOT&E plans to submit an additional annex to the combined IOT&E and LFT&E report in 2QFY25.

» MAJOR CONTRACTORS

- Boeing Defense, Space & Security – St. Louis, Missouri
- RTX, Agile Radar Solutions – El Segundo, California
- General Electric – Cincinnati, Ohio

TEST ADEQUACY

During IOT&E, the threat level was adequate for the current F-15EX mission set. However, the mission-level testing did not include some advanced, longer-range threat weapons becoming operational at the time of F-15EX fielding. Subsequent FOT&E testing will be required to assess the system against higher threat levels in more complex mission scenarios. The Air Force successfully used Open Air Battle Shaping (OABS) instrumentation during the F-15EX IOT&E. However, due to limitations in open air range infrastructure, the Air Force is exploring incorporating the F-15EX into the Joint Simulation Environment (JSE) to enable testing and training that cannot currently be conducted on DoD's major test and training ranges.

In FY24, the Air Force completed remaining data collection for the alternative LFT&E strategy that DOT&E approved in January 2021. These studies were approved by DOT&E and include susceptibility and vulnerability analyses, while accounting for the F-15EX's performance, configuration, tactics, techniques, procedures, and countermeasures.

In June 2024, the Air Force Operational Test Center conducted – and DOT&E observed – a cooperative vulnerability and penetration assessment (CVPA) at Eglin AFB, Florida, which generated some of the data needed to characterize the performance of the F-15EX while under cyber-attack. A subset of the new systems in the Lot 1B F-15EX was investigated during the event. The program office held a Mission-Based Risk Assessment Process – Cyber (MRAP-C) in May 2024. The results from that MRAP-C will aid

in the planning of a cybersecurity vulnerability identification for a Lot 2 aircraft, to be conducted in FY25. Additional cooperative and adversarial cyber testing is necessary before DOT&E can evaluate the platform. In FY25, the Air Force will submit for DOT&E approval an FOT&E test plan that will include cyber testing.

PERFORMANCE

» EFFECTIVENESS

DOT&E published the combined IOT&E and LFT&E report with classified annex in November 2023 to support the June 2024 FRP decision. Against the level of threat tested, the F-15EX is operationally effective in all its air superiority roles, including defensive and offensive counter-air against surrogate fifth-generation adversary aircraft, as well as basic air-to-ground capability against the tested threats. The F-15EX was able to detect and track all threats at advantageous ranges, use onboard and off-board systems to identify them, and deliver weapons while surviving. No further operational testing is planned until the test fleet is modified to the Lot 2 configuration. The Air Force Operational Test and Evaluation Center's Detachment 6 is currently drafting the test plan for DOT&E approval to support FOT&E in FY25 – 26 on F-15EX aircraft that are representative of Lot 2 or later configurations.

» SUITABILITY

DOT&E's final assessment of F-15EX suitability was in the F-15EX combined IOT&E and LFT&E report, which was published in November 2023 to support the June 2024 FRP decision. The F-15EX met all its reliability, availability, and maintainability requirements and achieved nearly all objectives although maintenance technical orders were still immature. Survey data assessing human-systems interactions show the pilots had positive opinions of F-15EX cockpit usability. While training for both pilots and maintainers on the new systems is currently lacking, the Air Force plans to have all training available in time for initial operational capability. At the time of the combined IOT&E and LFT&E report, the F-15EX Program Office had only completed Pre-Published and Preliminary Technical Order (TO) delivery for the Lot 1 aircraft TOs. The program has since completed delivery of all TOs for the Lot 1 fielding configuration and has completed certification and verification of 70 percent of them with a planned certification and verification completion date of November 2024. The TOs, for the Lot 2 configuration that is planned for the FOT&E, are expected to be completed in 3QFY25.

» SURVIVABILITY

In FY24, the Air Force completed all survivability studies in the DOT&E-approved Alternative LFT&E Strategy. DOT&E is currently analyzing the results of the survivability studies and will submit an additional annex to the November 2023 combined IOT&E and LFT&E report in 2QFY25.

As noted in the FY23 Annual Report and program strategy document that supports the FRP decision, DOT&E cannot evaluate the cyber posture of the F-15EX without additional cooperative and adversarial testing, to include a Lot 2 or later production aircraft. The Air Force will incorporate results from the CVPA and MRAP-C into the FOT&E test plan and submit it to DOT&E for approval.

RECOMMENDATIONS

The F-15EX Program Office should:

1. Ensure the F-15EX test fleet is production representative by modifying test aircraft to include any configuration or equipment changes that occur in future production lots, as recommended in the FY22 Annual Report.
2. Submit a TEMP that outlines test events and allocates resources for the period between the FY24 FRP decision and the fielding of Lot 6, as recommended in the FY23 Annual Report.
3. Continue to incorporate OABS and high-fidelity threat radar emulators into the F-15EX FOT&E, as recommended in the FY23 Annual Report.
4. Procure an F-15EX platform model for use in JSE. To ensure concurrence with fleet aircraft, the JSE model should be based on actual Operational

Flight Program and accurate weapons capabilities.

5. Incorporate results from the CVPA and MRAP-C into the FOT&E test plan and submit it to DOT&E for approval.