

AIM-9X Block II Sidewinder



In July 2024, DOT&E published a classified AIM-9X Block II Operational Flight Software (OFS) 9.411 Lethality and Cyber Survivability Annex. The AIM-9X Block II Sidewinder is undergoing several updates. FOT&E of OFS 9.5, a software update that includes performance improvements and two new capabilities, is scheduled to begin in 1QFY25. The current test concept for OFS 9.5 does not include sufficient live missile tests to adequately test the two new capabilities. The program office states the limited number of missiles is due to a program resource limitation. The Services have been notified of DOT&E's concern.

FOT&E of a new hardware configuration, OFS 10.4, that re-hosts the current fleet-released version (OFS 9.411) is scheduled to begin in 2QFY25. The current test concept for OFS 10.4 may be adequate to assess the new hardware, pending a configuration review by DOT&E of developmental test (DT)/integrated test (IT) live missile tests. The TEMP and test execution plan for OFS 10.4 still need to be submitted to DOT&E for review and approval.

SYSTEM DESCRIPTION

AIM-9X Block II is the latest-generation, infrared, short-range, air-intercept missile, designed to detect, acquire, intercept, and destroy a wide range of airborne threats. It is day and night capable, uses a passive infrared seeker, and is capable of large attack angles against a wide variety of enemy aircraft. The designated threshold platforms are the F/A-18C/D/E/F and the F-15C/D. Current and future integration efforts also include the F/A-18A/B, E/A-18G, F-15E/EX, F-16C/D, F-22A, F-35A/B/C, MQ-9, AV-8B, AH-1Z, and A-10.

AIM-9X Block II OFS 9.5 is a software update of the currently fielded OFS 9.411. This update is intended to incrementally improve missile performance and provide new capabilities. OFS 10.4 is a rehost of OFS 9.411 on new hardware, which includes new guidance control unit electronics and a new inertial measurement unit. OFS 10.5 will combine OFS 9.5 with the new hardware and will replace the current sapphire missile seeker dome with a new material.

MISSION

AIM-9X Block II is utilized by the U.S. Navy, Marine Corps, and Air Force, as well as several foreign military forces, to execute short-range offensive and defensive air-to-air combat missions. AIM-9X Block II is also a primary element of the

Integrated Air and Missile Defense and Theater Air and Missile Defense Family of Systems.

PROGRAM

AIM-9X Block II is an Acquisition Category IC program. It is a joint program led by the Navy's Air-to-Air Missiles Program Office (PMA-259). The Navy's Operational Test and Evaluation Force is the Operational Test Agency for OFS 9.5, 10.4, and 10.5 FOT&E efforts.

DOT&E published a classified AIM-9X Block II OFS 9.410 FOT&E report in September 2021 and a classified AIM-9X Block II OFS 9.411 Lethality and Cyber Survivability Annex in July 2024. The annex was delayed so the Navy could accredit the cyber test asset and the lethality models, completed in October 2023 and July 2024, respectively. OFS 9.410 and the currently fielded OFS 9.411 are functionally the same software with the same capabilities.

The Services are scheduled to start FOT&E for OFS 9.5 in 1QFY25 and OFS 10.4 in 2QFY25. The current test concept for OFS 9.5 does not include sufficient live missile tests to adequately test the two new capabilities provided by this update due to a program resource limitation. The current test concept for OFS 10.4 may be adequate to assess the new hardware, pending a configuration review by DOT&E of DT/IT live missile tests. The TEMP and test plan for OFS 10.4 still need to be submitted to DOT&E for review and approval. The Services are also in the process of test planning for AIM-9X Block II

OFS 10.5, with operational testing expected to begin in 2QFY26.

» MAJOR CONTRACTOR

- Raytheon, a subsidiary of RTX – Tucson, Arizona

TEST ADEQUACY

The Navy completed FOT&E of the AIM-9X Block II OFS 9.410 in October 2021, in accordance with DOT&E-approved test plans. DOT&E personnel observed the testing. Testing was adequate to assess the operational effectiveness, lethality, suitability, and cyber survivability of the missile.

The availability of threat surrogates for test remains a challenge when assessing missile effectiveness and lethality. OFS 9.5, 10.4, and 10.5 live missile tests may include limited or no full-scale targets due to test asset availability limitations. Additionally, surrogates for many other modern threats do not currently exist. These test asset limitations put greater importance on modeling and simulation to adequately characterize the performance of the AIM-9X Block II. However, verification, validation, and accreditation of modeling and simulation are also negatively affected, due to the lack of relevant flight test data against representative targets. The Services should fund, develop, and produce modern aerial targets such as fourth- and fifth-generation fighter aircraft, large bomber and mobility aircraft, helicopters,

and others as discussed in the Test and Evaluation Resources section of this Annual Report.

PERFORMANCE

» EFFECTIVENESS AND SUITABILITY

DOT&E assessed AIM-9X Block II OFS 9.410 as being operationally effective and suitable in a FOT&E report completed in September 2021. AIM-9X Block II remains on oversight and DOT&E will continue to evaluate operational effectiveness and suitability in upcoming operational testing.

» LETHALITY AND SURVIVABILITY

AIM-9X Block II OFS 9.411 lethality and cyber survivability evaluation details and recommendations are available in the classified DOT&E AIM-9X Block II OFS 9.411 Lethality and Cyber Survivability Annex of July 2024. The report includes one classified recommendation to improve lethality and four to improve cyber survivability.

3. Submit the TEMP and test plan to support OFS 10.4 operational testing, in accordance with published timelines to DOT&E for approval.
4. Fund, develop, and produce modern aerial targets, such as fourth- and fifth-generation fighter aircraft, large bomber and mobility aircraft, helicopters, and others, as discussed in the Test and Evaluation Resources section of this Annual Report. This shortfall is beyond the scope of the AIM-9X Block II program and must be addressed at the Department of the Navy and Department of the Air Force levels.

RECOMMENDATIONS

The Navy should:

1. Adequately test the operational effectiveness and suitability of the two new capabilities delivered in OFS 9.5.
2. Submit configuration data for OFS 10.4 DT/IT live missile tests to DOT&E for review.