

AIM-9X Air-to-Air Missile Upgrade

Executive Summary

- On July 29, 2013, the Program Executive Officer formally decertified AIM-9X Block II due to deficiencies discovered during IOT&E that affected missile performance. As of November 2013, the root causes of these deficiencies were still under investigation.
- The Navy and Air Force began IOT&E on April 27, 2012. Prior to decertification to continue operational testing, the Navy completed 18 of 22 planned captive-carry events, 5 of 9 live missile shots, and 1 repeat test shot. The Air Force completed 18 of 22 captive-carry events and 6 of 8 live missile shots. Of the 12 live missile shots, 7 were within lethal radius of the target. The Services plan to return to IOT&E in 3QFY14.
- As of July 29, 2013, the Navy and Air Force accomplished 6,353 total operating hours with 22 failures resulting in a Mean Time Between Critical Failure (MTBCF) of 288.79 hours. The current system reliability is significantly below the value on the reliability growth curve consistent with reaching the requirement of 500 hours MTBCF at 80,000 hours.

System

- AIM-9X is the latest generation short-range, heat-seeking, air-to-air missile. The currently fielded version of the missile is AIM-9X Block I, Operational Flight Software (OFS) 8.220, which includes limited lock-on-after-launch, full envelope off boresight capability without a helmet-mounted cueing system, and improved flare rejection performance.
- AIM-9X is highly maneuverable, day/night capable, and includes the warhead, fuze, and rocket motor from the previous AIM-9M missile.
- AIM-9X added a new imaging infrared seeker, vector controlled thrust, digital processor, and autopilot.
- F-15C/D, F-16C/D, and F/A-18C/D/E/F aircraft are capable of employing the AIM-9X.
- The AIM-9X Block II is the combination of AIM-9X-2 hardware and OFS 9.3.
 - AIM-9X-2 is the latest hardware version and is designed to prevent parts obsolescence and provide processing

Activity

- On July 29, 2013, the Program Executive Officer formally decertified AIM-9X Block II (AIM-9X-2 with OFS 9.311) for operational testing due to deficiencies discovered during IOT&E that affected missile performance. As of November 2013, the root causes of these deficiencies were still under investigation.



capability for the OFS 9.3 upgrade. The AIM 9X-2 missile includes a new processor, a new ignition battery for the rocket motor, an electronic ignition safety/arm device, and the DSU-41/B Active Optical Target Detector fuze/datalink assembly.

- OFS 9.3 is a software upgrade that is intended to add trajectory management to improve range, datalink with the launching aircraft, improved lock-on-after-launch, target re-acquisition, and improved fuzing.

Mission

Air combat units use the AIM-9X to:

- Conduct short-range offensive and defensive air-to-air combat
- Engage multiple enemy aircraft types with passive infrared guidance in the missile seeker
- Seek and attack enemy aircraft at large angles away from the heading of the launch aircraft

Major Contractor

Raytheon Missile Systems – Tucson, Arizona

- Between the start of IOT&E on April 27, 2012, and decertification, the Navy completed 18 of 22 planned captive-carry events, 5 of 9 planned live missile shots, and 1 repeat test shot. The Air Force completed 18 of 22 captive-carry events and 6 of 8 live missile shots. Of the

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12 live missile shots conducted during operational testing, 7 were within lethal radius of the target.

- After the Program Office identifies the root causes for deficiencies and implements hardware and/or software solutions, they will request recertification for IOT&E.
- Before decertification, the Navy and Air Force intended to complete IOT&E in July 2013, with a Full-Rate Production decision in April 2014 and Initial Operational Capability in September 2014. The Services plan to return to IOT&E in 3QFY14.
- The Program Office conducted the IOT&E in accordance with the DOT&E-approved Test and Evaluation Master Plan.

Assessment

- During operational testing, 7 of 12 total AIM-9X Block II shots guided to within lethal radius of the drone. The developmental testing record was 9 of 12 shots within lethal radius; however, one missile did not receive a fuze pulse. As of July 29, 2013, the total hit rate was assessed as 15 of 24.
- Aircrew observed missile flyout for 8 of the 12 operational test shots. For seven of the eight shots, they witnessed excessive oscillations, or “porpoising.” The Navy and Air Force assessed two of the observed missile shots as “misses” due to internal measurement unit errors. Data from four shots show possible deficiencies with the guidance, navigation, and control software or the internal measurement unit hardware.

- All captive-carry missions were nominal, but the Air Force repeatedly highlighted one performance discrepancy with AIM-9X Block II Helmet-less High Off-Boresight (HHOBS) performance. Aircrew reported that Block II is slower to acquire targets in HHOBS than Block I. The Capability Production Document requires Block II performance be equal to or better than baseline AIM-9X performance.
- At the Operational Test Readiness Review, reliability was 232 hours MTBCF and was projected to reach 316 hours at the end of IOT&E. The Navy and Air Force accomplished 6,353 total operating hours with 22 failures, resulting in an MTBCF of 288.79 hours. The current system reliability is significantly below the value on the reliability growth curve consistent with reaching the requirement of 500 hours MTBCF at 80,000 hours. DOT&E will track reliability in the IOT&E.

Recommendations

- Status of Previous Recommendations. The Navy addressed the previous recommendations.
- FY13 Recommendation.
 1. The Navy should submit for approval an updated operational test plan after implementing hardware and/or software solutions to fix identified deficiencies.