

AIM-9X Air-to-Air Missile Upgrade

Executive Summary

- The AIM-9X program plans to complete development of software updates to the baseline missile in FY07.
- The program office halted developmental testing to review mission failures of two new capabilities: lock-on-after-launch and a rudimentary air-to-ground capability.
- Program office efforts to identify technical risks and conduct thorough developmental testing highlight the value of realistic, end-to-end testing prior to operational testing.
- The Services should carefully consider the results of the lock-on-after-launch and air-to-ground operational testing before committing to fielding the new capabilities.
- Future (beyond FY12) AIM-9X operational testing will not be adequate without a full-scale target. The Services should begin a target development program as soon as practical.



System

- AIM-9X is the latest generation short-range, heat-seeking, air-to-air missile.
- It is highly maneuverable, day/night capable, and includes the warhead, fuse, and rocket motor from the previous AIM-9M missile.
- AIM-9X adds a new imaging infrared seeker, vector-controlled thrust, digital processor, and autopilot. It can be carried by F-15C/D, F/A-18 C/D, and F/A-18 E/F aircraft and includes a container for storage and maintenance.
- Engage multiple enemy aircraft types using passive infrared guidance in the missile seeker, using external cues (other than the missile seeker itself) from multiple aircraft systems, including radar and the Joint Helmet Mounted Cueing System
- Seek and attack enemy aircraft at large angles away from the launch aircraft
- AIM-9X helps close the gap in short-range combat capability between U.S. aircraft and primary enemy threat aircraft.

Mission

- Air combat units use the AIM-9X to:
 - Conduct short-range offensive and defensive air-to-air combat

Activity

- The AIM-9X program continued development of software updates to the baseline missile.
- The program completed several flights in support of development as well as recurring weapon system evaluation flight tests. A number of these missions failed to destroy the target, even though the missile functioned correctly.
- Before entering operational testing, the program office halted developmental testing to verify the technical risks and the incremental steps in adding the new capabilities.
- The program office conducted an extensive review of all failures and test environments and verified that remaining testing would provide the desired information to evaluate the improved capabilities.
- The program resumed developmental testing in October 2006, and will begin the next phase of operational testing in 2007.
- DOT&E received the operational test concept briefing from the Commander, Operational Test and Evaluation Force test team in July 2006. The program is coordinating a Test and Evaluation Master Plan page change update to document the test approach. DOT&E expects to approve the related operational test plan shortly thereafter, prior to the December start of operational testing.

Assessment

- The ongoing AIM-9X development is intended to rectify the two most significant deficiencies found during operational testing. The development also provides the first step in reaching a lock-on-after-launch capability. In addition, the Air Force requested a Wartime Rapid Acquisition Program to develop a rudimentary AIM-9X air-to-ground capability.

AIM-9X needs hardware and software updates to fully achieve the lock-on-after-launch (and possibly air-to-ground) capability.

- Analysis and review of two failed missions found the tests occurred during environmental conditions (not obvious to the test crews) that provide the greatest challenge to any infrared missile.
- Early analysis indicates that the lock-on-after-launch capability may be too challenging for the current software and hardware design.
- The missile may not achieve a useful capability against ground targets without more extensive development and software/hardware changes that exceed the rapid acquisition program's schedule and funds.
- The test results indicate the value of robust, end-to-end developmental testing at the limits of hardware and software capabilities, prior to producing and delivering missiles for operational testing.
- The AIM-9X program has sufficient assets for near-term testing. However, full-scale targets will not be available after FY12. Future development and ongoing fleet evaluations will require a new full-scale target for adequate operational testing.

Recommendations

- Status of Previous Recommendations. The program took action on all but one of the FY05 DOT&E recommendations: FY05 #3: DOT&E recommended that the program plan a robust, event-driven test strategy for the next increment in the program. Planning for this increment is not yet complete.
- FY06 Recommendations.
 1. The Services should carefully consider the results of the lock-on-after-launch and air-to-ground operational testing before committing to fielding the new capabilities.
 2. The next AIM-9X increment (referred to as Block II) will add new hardware and software capabilities well beyond the current system. The program should plan a test strategy to conduct robust, end-to-end testing at the limits of capability before producing and delivering missiles for operational testing.
 3. The program should not commit beyond initial production of the next increment until operational testing and reporting is complete.
 4. The Services should begin planning and development of a full-scale target for program testing beyond FY12.