Advanced Medium-Range Air-to-Air Missile (AMRAAM) AIM-120

Executive Summary
- AIM-120C-7 Advanced Medium-Range Air-to-Air Missile (AMRAAM) operational testing completed in August 2007. Nine of 11 operational test events were successful.
- AIM-120D is currently in developmental testing by the Air Force and Navy at Eglin Air Force Base and China Lake Naval Weapons Station.

System
- The AIM-120 AMRAAM is an all-weather, radar-guided air-to-air missile with capability in both the beyond-visual-range and within-visual-range arenas.
- The AMRAAM program develops and incorporates phased upgrades periodically.
- The latest version, the AIM-120C-7, completed operational testing in August 2007. It incorporates an upgraded antenna, receiver, signal processor, and new software algorithms to counter new threats. The use of smaller system components creates room for future growth.
- The AIM-120D, the next upgrade to the AMRAAM, is currently in development and will deliver performance improvements over the AIM-120C-7 through the use of an internal Global Positioning System, an enhanced data link, and new software.

Mission
- The Air Force and Navy, as well as several foreign military forces, use various versions of the AIM-120 AMRAAM to shoot down enemy aircraft.

- All U.S. fighter aircraft use the AMRAAM as the primary beyond-visual-range air-to-air weapon to shoot down enemy aircraft.
- A single launch aircraft can engage multiple targets with multiple missiles simultaneously when using AMRAAM.

Activity
- The AIM-120C-7 operational testing started in February 2005 and was originally scheduled to complete in March 2006. Air Force and Navy operational testing discovered two minor software deficiencies. The Air Force lead test agency combined operational testing with the software corrections into the remaining test period in 2007. Of 11 operational test events scheduled, nine were successful in completing their objectives.
- Developmental testing of AIM-120D, the next variant of AMRAAM, continues. The AIM-120D is planned to provide significant improvements in capability, to include Global Positioning System-assisted guidance and data link.

Assessment
- The AIM-120C-7 completed operational testing over a year behind schedule.
- With the exception of the timeline, testing to-date has been in accordance with the DOT&E-approved Test and Evaluation Master Plan and associated test plan.
- AIM-120D developmental and operational testing has been impacted by AIM-120C-7 developmental delays. The model for AIM-120C-7 must be validated prior to modeling for the AIM-120D.
- Range scheduling priorities between major defense programs, coupled with target presentation failures, have caused significant delays in completing live fire and captive carry tests.
- Potential software changes made as a result of operational testing may need to be retested on AIM-120D to ensure operational effectiveness.
- Failed target presentations of full-scale targets (QF-4) and sub-scale targets (MQM-107) caused multiple missile shoot

delays. Failures included availability, operator performance, and in-flight malfunctions altering target presentation and/or delayed testing. DOT&E estimates there were 6-8 months in program delays due to target related issues.

Recommendation

- Status of Previous Recommendations. The following FY05 and FY06 recommendations remain valid:
  - DOT&E recommended the program office include enough test missiles to adequately characterize effectiveness and suitability for the AIM-120D. DOT&E remains concerned the current number of shots planned may be insufficient to address all requirements and fully characterize operational effectiveness.
  - The Navy and Air Force should establish an independent validation plan for the models used for effectiveness evaluation. This plan must be approved by DOT&E prior to use.
  - The Range Commander's Council, in coordination with all test ranges and laboratories, must incorporate a seamless exchange of information between the various range and laboratory subject matter experts and provide better access to test resource availability for range users.
- FY07 Recommendations. The program office should:
  1. Ensure that modeling is complete and validated for the AIM-120C-7 prior to modeling for the AIM-120D.
  2. Seek changes to the Air Force full-scale and sub-scale target programs to ensure proper target presentation, target reliability, and availability.