

## Advanced Medium Range Air-to-Air Missile (AMRAAM)

### Executive Summary

- The next update to the AIM-120 Advanced Medium-Range Air-to-Air Missile (AMRAAM), the AIM-120D, is currently in developmental testing by both the Air Force and Navy at Eglin AFB, Florida, and China Lake Naval Weapons Station, California.
- Key stakeholders, including the program office and DOT&E, suspended AIM-120D progression to operational testing (OT), pending resolution of four key technical deficiencies. These deficiencies include missile lockup, built-in test (BIT) failures, aircraft integration problems, and poor GPS satellite acquisition.

### 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. A single launch aircraft can engage multiple targets with multiple missiles simultaneously when using AMRAAM.
- The AMRAAM program develops and incorporates phased upgrades periodically.
- The latest version, the AIM-120C-7, completed operational testing in August 2007. It incorporated 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 is intended to deliver performance improvements over the AIM-120C-7 through



the use of an internal GPS, an enhanced datalink, 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.

### Major Contractor

Raytheon Missile Systems – Tucson, Arizona

### Activity

- Production of AIM-120D began in 2006, and developmental testing (DT) began in 2007.
- In 2009, key stakeholders, including the program office and DOT&E, suspended progression of the AIM-120D to OT due to four performance and reliability deficiencies, including missile lockup, BIT failures, aircraft integration problems, and poor GPS satellite acquisition.
- The Air Force accomplished the final DT/OT shot successfully in August 2011, but Raytheon has not yet resolved missile lockup or aircraft integration problems. The Air Force has not set a date for the Operational Test Readiness Review (OTRR).

### Assessment

- The AIM-120D was originally scheduled to begin OT in 2008; it is now more than three years behind schedule.
- DOT&E's approval of the Test and Evaluation Master Plan and OT plan are pending resolution of the deficiencies that

- suspended OT in 2009. Raytheon has solved the BIT fail problem and has developed a pending solution to the GPS failure problem. Weapons failure and aircraft integration deficiencies remain; therefore, the AIM-120D is not production-representative with stable hardware and software.
- The program office is pursuing advancement to OT without solutions to two major technical problems: weapons failure and aircraft integration. The program office should address and produce adequate solutions to these deficiencies before commencing OT.

### Recommendations

- Status of Previous Recommendations. The FY05 recommendation for the program office to include enough test missiles to adequately characterize effectiveness and suitability for the AIM-120D remains valid. The FY07 recommendation for the program office to seek changes to the Air Force's

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full-scale and sub-scale target programs to ensure proper target presentation, target reliability, and availability, also remains valid.

- FY11 Recommendation.
  1. The program office should produce adequate solutions to the identified technical deficiencies before initiating OT and should begin OT only when AIM-120D is production-representative, with stable hardware and software.