

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

AIM-120 is an all weather, radar-guided, air-to-air missile with launch-and-leave capability in both the beyond-visual-range and within-visual-range arenas, enabling a single aircraft to simultaneously engage multiple targets with multiple missiles. The Air Force and Navy, as well as several foreign military forces, use the AIM-120. Currently employed by the F-15C, F-15E, F-16, F/A-18C/D, and F/A-18E/F, AIM-120 will also be employed by the F/A-18E/F, F/A-22, and Joint Strike Fighter.

The AIM-120C variant with clipped wings was developed to reduce missile size in order to allow for increased internal carriage in the F/A-22. Lethality improvements have been incorporated into the missile, culminating in a new warhead and lengthened rocket motor. All current U.S. deliveries are of the AIM-120C configuration. The program's acquisition strategy is to improve missile capability incrementally through software and hardware modifications that are grouped in three pre-planned product improvement (P³I) phases, the first two of which have completed development and are fielded.

The third phase of the development program is underway to improve weapons system effectiveness and lethality. The Phase 3 missile, scheduled to begin production in FY04 as the AIM-120C-7, will include new guidance section hardware and software. The antenna, receiver, and signal processing portions of the system are being upgraded to handle the requirements to counter new threats, and will be compressed to create room for future growth. Some existing software will be re-hosted to a new higher-order language (C++), some existing software will be re-hosted and modified to function with the new hardware, and some additional software algorithms are being written to react to the new Phase 3 threats.

TEST & EVALUATION ACTIVITY

DOT&E approved the Test and Evaluation Master Plan (TEMP) for the P³I Phase 3 missile in June 2002. Developmental test and evaluation of the Phase 3 missile has started with a small number of captive carry missions, hardware-in-the-loop testing, and end-to-end shots. The Air Force's Air Combat Command and the Navy's Air Test and Evaluation Squadron will conduct the operational test and evaluation under the oversight of the Air Force Operational Test and Evaluation Center and the Navy's Commander Operational Test and Evaluation Force in FY04. The operational test and evaluation will consist of captive carry, simulations using the contractor's model, and ten guided free-flight evaluations against threat representative targets. The evaluation will include integration on F-15, F-16, F/A-18C/D, and F-/A-18E/F aircraft. In accordance with the TEMP, free-flight events will be repeated as necessary to ensure that missile capabilities in the discrete scenarios are fully evaluated.

TEST & EVALUATION ASSESSMENT

The Phase 3 P³I missile is largely a new missile with distinct capabilities from previous variants of the AIM-120. Hardware and software changes in the guidance section are significant. The improvements sought by the user are intended to increase the air-to-air combat capability of both Services. However, as acknowledged in the TEMP, the program will not deliver all of the Phase 3 requirements called for in its joint operational requirements document. In the upcoming follow-on operational test and evaluation, DOT&E will independently assess the impact of any required capability that is not developed and operationally tested when reporting the operational effectiveness and suitability of performance of the missiles actually tested.

Three of four Phase 3 developmental test shots were unsuccessful due to a variety of factors dealing with aircraft integration and materiel failures that are currently assessed by the Air



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AIR FORCE PROGRAMS

Force as not pertinent to technical development of the Phase 3 missile. A fourth shot was successfully conducted. DOT&E continues to monitor progress towards accreditation of the model and readiness for operational testing. The limited number of planned live shots places a strong reliance on modeling and simulation to confirm the full weapons employment envelope and operational effectiveness of the Phase 3 P³I AMRAAM missile. The modeling and simulation suite has not yet been delivered to the government organizations that must understand and validate it. If this situation is not corrected, completion of operational testing on schedule is in jeopardy. Additional live test shots will have to be added to the planned operational test to ensure an adequate effectiveness evaluation in the event that the modeling and simulation suite cannot be validated.