

## **MEDIUM EXTENDED AIR DEFENSE SYSTEM (MEADS)**



### **Army ACAT IC Program**

Total Number of Systems:	TBD
Total Program Cost (TY\$):	TBD
Average Unit Cost (TY\$):	TBD
Milestone B:	FY04
Milestone C:	FY09
FUE:	FY12

### **Prime Contractor**

MEADS International (Lockheed Martin,  
Daimler Chrysler Aerospace and Alenia)

### **SYSTEM DESCRIPTION & CONTRIBUTION TO JOINT VISION 2020**

The Medium Extended Air Defense System (MEADS) will be a highly mobile, low to medium altitude air defense system designed to ensure protection of maneuver forces. It will be a key element of the theater missile defense in the Army Air and Missile Defense architecture. The system will provide area and point defense capabilities against multiple, simultaneous, 360° attacks by ballistic missiles and rockets, air-to-surface missiles, cruise missiles, and aircraft. These threats may employ conventional and/or weapons of mass destruction warheads.

A MEADS battle element will consist of 360° surveillance and fire control radars, launchers, missiles, and Tactical Operations Centers (TOC). MEADS will be capable of deployment as a single battle element or as a battalion operating from geographically displaced locations. All system components will be employed in a distributed architecture using high-capacity tactical communications. Netted and distributed sensors will provide continuous, redundant, and optimized target tracking. TOCs can control launchers from other battle elements if tactical circumstances require it. As part of the Army

Air and Missile Defense Architecture, the system will be compatible and interoperable with other Army, Joint Service, and allied systems expected to participate in joint/combined operations in the 21<sup>st</sup> century.

The MEADS system is a response to ensure protection of maneuver forces. The system will provide area and point defense capabilities against tactical missiles and air breathing threats. MEADS will contribute to three of the four *Joint Vision 2020* operational concepts: *precision engagement*, *full-dimensional protection*, and *dominant maneuver* forces. MEADS incorporates state-of-the-art technologies in its sensors, weapons, and BM/C<sup>4</sup>I systems. *Information superiority* will enable MEADS to be fully capable of operating autonomously or in a network, receiving and exchanging data with other theater air and missile defense systems and external sensors. The MEADS system will help ensure that Joint Forces enjoy *full-spectrum dominance* in the theater by being a primary contributor to *full-dimensional protection* of the *dominant maneuver* forces through *precision engagement* of threat tactical missiles and air breathing threats.

## **BACKGROUND INFORMATION**

The MEADS program was scheduled to transition to the Design and Development Phase in FY99. However, given competing priorities for U.S. Ballistic Missile Defense resources, the U.S. proposed a restructured MEADS program to include a three-year Risk-Reduction Effort. This restructured program is based on the PAC-3 missile. Germany and Italy have accepted the PAC-3 missile as the initial interceptor for MEADS. The U.S. has fully funded the MEADS program by adding \$721M from FY02-FY05, and the program schedule supports the first MEADS flight test in FY06 and a U.S. First Unit Equipped (FUE) in FY12. The Army modernization plan for MEADS initially replaces four PATRIOT battalions with MEADS battalions by FY15, and eventually replaces all PATRIOT battalions with MEADS battalions.

On November 15, 1999, the NATO MEADS Management Agency (NAMEADSMA) awarded a contract to MEADS International [a partnership between Lockheed Martin, Daimler Chrysler Aerospace AG (now European Aeronautic Defence and Space Company), and Alenia Marconi Systems] to begin work on the next phase of the program. This effort supported the transition of MEADS into the Risk-Reduction Effort. The three-year Risk-Reduction Effort contract is expected to be awarded to MEADS International in early FY01.

The proposed program management structure includes both U.S. and international arrangements. U.S. oversight is planned to be accomplished through the Integrated Product Team (IPT) process. The Army's MEADS National Product Office oversees U.S. requirements development and serves as the single point of contact for U.S. support to NAMEADSMA. International oversight is accomplished through the National Armaments Directors and a MEADS Steering Committee. The Army PEO for Air and Missile Defense represents the United States on the Steering Committee. Leadership positions of NAMEADSMA will rotate among the nations.

The MEADS acquisition concept will tailor new DoD 5000.2 guidance with the NATO acquisition process. Since NATO defers most risk-reduction activity to the Design and Development Phase, the program will be reviewed at the following key acquisition points:

- The end of Program Definition/Validation and Risk-Reduction phases (the Milestone B D&D decision).

- After the Critical Design Review (a Milestone II-like system development decision).
- Before starting Low Rate Initial Production (LRIP) (the Milestone C LRIP decision).
- Two years into the NATO production phase (a Milestone III-like decision).

Program documentation at each decision point will match what would normally be available for U.S. milestone decisions.

### **TEST & EVALUATION ACTIVITY**

Several T&E IPTs were held during this reporting period to begin planning the test program. Now that the program has been restructured to incorporate the PAC-3 interceptor, the T&E IPT needs to develop a T&E strategy that builds on the testing conducted as part of the PAC-3 program. A U.S. Lethality Working Group will be formed to develop a U.S. LFT&E Strategy. A NAMEADSMA Lethality Working Group will also address lethality issues of concern to the international partners. T&E activity is currently on hold pending the signing of the international contract, but contractor testing will begin during RRE and lead up to an RRE Exit Demonstration where prototype MEADS elements will detect and track fixed-wing targets, generate missile-fire solutions, and conduct virtual intercepts.

### **TEST & EVALUATION ASSESSMENT**

The sponsoring countries have together developed the MEADS system international-operational requirements. According to the requirements, the MEADS system must provide area and point defense capabilities against a variety of tactical-missile and air-breathing threats. The MEADS mission is complicated by having to accomplish its mission in a maneuver area that can be densely populated with both friendly forces and threat targets. The system development risks and challenges that exist for all other missile defense systems also exist for MEADS. The MEADS system must acquire, track, and identify both friendly and threat targets, fuse the data, and then effectively engage and kill the threat targets. The difficulty and risk associated with MEADS development is high, and includes issues with the following major end items:

- ***X-Band Fire Control Radar:*** Producibility of high power and high-efficiency transmit/receive modules; thermal performance; performance of a low noise exciter; jamming and clutter cancellation; classification, discrimination, and identification in ECM and/or clutter environments; and operation while rotating 360 degrees.
- ***BM/C<sup>4</sup>I:*** Development of the netted and distributed architecture; sensor management and track fusion for multiple radars (both X-band fire control and UHF surveillance); and incorporation of external cues.
- ***PAC-3 Missile:*** Demonstration of hit probability against the MEADS target set in stressing environments; demonstration of lethality against the MEADS target set; integration of the PAC-3 missile into the MEADS system (including potential modifications to add X-band communications).

Due to the requirement to effectively kill multiple types of targets, the T&E program will be complex, difficult, and costly compared to other Theater Missile Defense (TMD) systems. Its LFT&E program will need to address lethality against a broader target set and a more diverse intercept space than those of other TMD systems. The flight-test matrix is being restructured to make use of PAC-3 missile testing, but some PAC-3 capabilities are being deferred until after the PAC-3 Milestone III Decision; PAC-3 follow-on testing is still undefined. During FY01, we will develop a MEADS test program that includes a balanced mix of testing supported by modeling and simulation. We will coordinate with the U.S. National Product Office to plan a thorough T&E program for MEADS that satisfies U.S. T&E requirements and meets the needs of the partner nations.