



# MEADS: Evolving Capabilities

**T**he Medium Extended Air Defense System (MEADS) is a mobile air defense system being developed by Germany, Italy and the US. It will replace Patriot in the US, Hawk in Germany and Nike-Hercules in Italy and will supplement Patriot systems in Germany.

To meet the Army's scheduled fielding beginning in 2015, MEADS program engineers now are finalizing design drawings and test approaches for tri-national approval of the major end items that make up the advanced air and missile defense (AMD) system (see figure).

**Flexibility for the Air Defense Commander.** MEADS' major end items are smaller and designed for use in multiple configurations, so the system gives warfighters new options that increase flexibility, accessibility and response times.

MEADS will be able to drive or roll-on/roll-off C-130 and A400M aircraft and thus deploy quickly to the theater of operations. In the forward area, MEADS will be able to keep pace with fast-moving maneuver forces.

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By William C. Wiese

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"Plug-and-fight" flexibility is being developed that will allow MEADS to exchange data with non-MEADS sensors and shooters and to move with ground forces and interoperate with other allied forces. Netted and distributed battle management command, control, communications, computers and intelligence will permit battle elements to join in or break off to protect forces as they move.

MEADS is required to command several distributed missile launchers while simultaneously detecting and tracking hostile forces and targets. Multiple communication paths will result in a system that is highly robust against jamming, providing significant protection while maneuvering, yet allowing dispersion of units over a wide area. It will be possible to hand over command and control of the launchers and missiles to a neighboring battle management unit while the initial systems are moved.

The design approach emphasizes high firepower and performance, reducing the

number of assets required to defend a given area. Battle management decisions are made in the tactical operations center (TOC) shelter, which is vital to coupling both engagement operations and force operations with intra- and intersystem networks. The German, Italian, US and NATO command and control functionality is packaged in a single-shelter configuration carried on three separate national prime movers based on national operational preferences.

Each TOC version is capable of nation-specific air transport. There are three workstations in the shelter configuration; however, for normal engagement operations and force operations, only two operators are required.

All equipment within the TOC shelter is ruggedized commercial-off-the-shelf or military-off-the-shelf. The self-contained shelter equipment meets all of the operational, environmental, personal protection and transportability requirements of the International Technical Requirements Document that governs MEADS.

The MEADS requirements emphasize open architecture, plug-and-fight sys-

MSgt Ronnie Klipp, 403rd Aircraft Maintenance Squadron, monitors the loading of the Medium Extended Air Defense System onto an US Air Force C-130J during the Berlin Air Show, Berlin, Germany, 17 May 2006. (Photo by Wolfgang Hofman, Department of Defense)

tems capabilities and mandate that both MEADS and non-MEADS end items be integrated into a task force by MEADS. “The requirements mandate that MEADS must dynamically integrate both MEADS and non-MEADS major end items into a task force. We are also working to a performance objective that the MEADSTOC must be able to function as an AMD task force TOC,” said Jim Cravens, MEADS International president.

**New Capabilities for the Warfighter.**

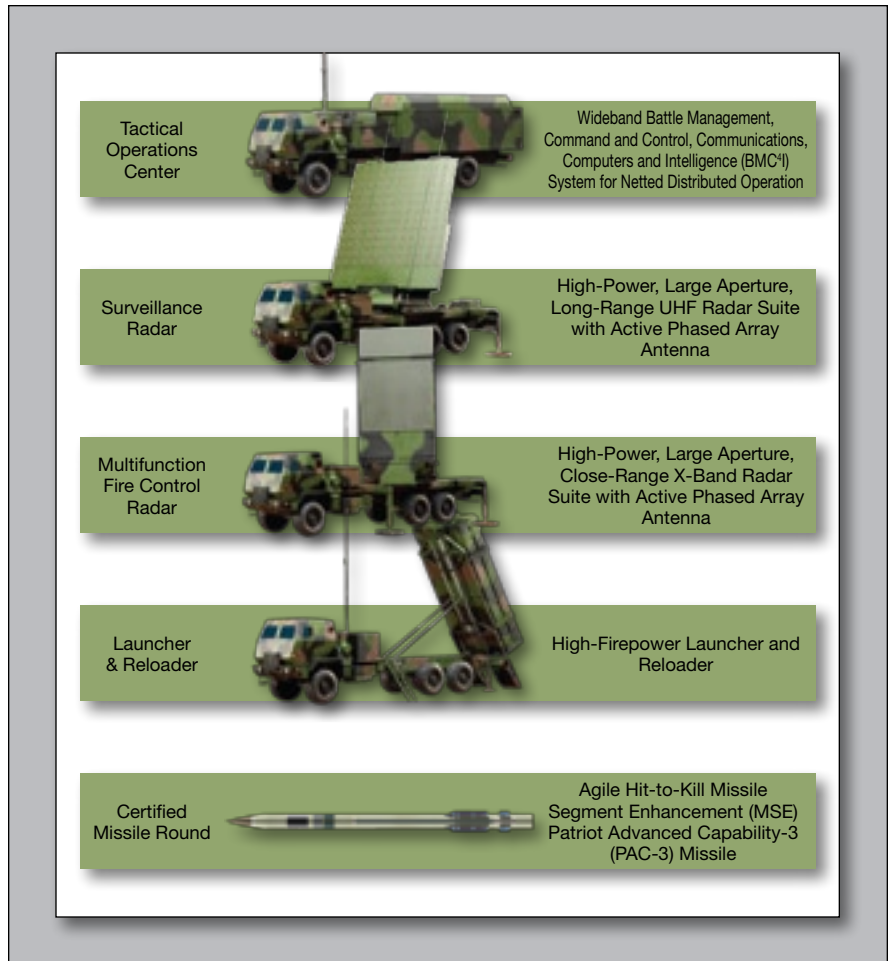
A more powerful Missile Segment Enhancement (MSE) variant of the hit-to-kill Patriot Advanced Capability 3 (PAC-3) missile is being incorporated into the MEADS system by MEADS International.

When completed, MEADS will provide capabilities well beyond any currently fielded AMD system. MEADS includes 360-degree surveillance and fire control sensors, high-firepower launchers and “plug-and-fight” battle management command and control abilities. The system will combine superior battlefield protection with flexibility, allowing it to protect maneuver forces and provide homeland defense against tactical ballistic missiles, cruise missiles, unmanned aerial vehicles and aircraft.

Testifying before the House Armed Services Committee Strategic Forces Subcommittee on 17 April, Lieutenant General Kevin T. Campbell, Commander of the US Army Space and Missile Defense Command/US Army Forces Strategic Command and Joint Functional Component Command, said, “MEADS, a cooperative development program with Germany and Italy, will provide a lighter, more deployable, maneuverable, lethal, network-centric AMD capability.

“The program also includes development of the PAC-3 MSE as the objective tri-national MEADS missile. The PAC-3 MSE is currently under development and will be integrated into the MEADS program. The MSE missile will provide a more agile and lethal interceptor that expands the engagement envelope of this system...”

**Added Capabilities, Expanded Lethality.** A key benefit of the MEADS plug-and-fight capability will be command and control over other AMD system



**End Items of the Medium Extended Air Defense System**

elements through standardized interfaces. Germany, for example, plans to use a surface launched variant of its Infrared Imaging System—Tail/Thrust Vector Control (IRIS-T) air-to-air missile with MEADS, while the US Army is considering the Surface Launched Air-to-Air Medium-Range Missile (SLAAMRAM) as a secondary missile in the US MEADS configuration.

In the past, incorporating additional missiles or sensors into an AMD system would have been difficult, but MEADS will provide a unique ability to work with secondary missile systems, if selected by the participating countries, and to evolve as other capabilities are developed.

This flexibility was demonstrated in 2006 when the MEADS Steering Committee decided to upgrade the baseline PAC-3 missile used in the MEADS system, authorizing a move to the PAC-3 MSE version that currently is in development. The new interceptor increases the system’s range and lethality over the baseline PAC-3, which was selected as the primary missile for MEADS when the design and development program

began in 2004.

The MSE missile, under development by Lockheed Martin Missiles and Fire Control, is an even more powerful version of the combat-proven hit-to-kill missile now in production. It increases the engagement envelope and defended area by using more responsive control surfaces and a more powerful rocket motor.

“We are confident that this path [fielding MEADS] will provide our forces, allies, friends and our nation with the most capable air and missile defense system possible,” General Campbell said in his testimony.

**William C. “W.C.” Wiese is the Communications Manager for MEADS International, the multinational joint venture—between Lockheed Martin and partner companies in Italy and Germany—that is developing the Medium-Extended Air Defense System (MEADS). His 36-year career at Lockheed Martin includes communications work on Patriot, Copperhead, strategic air defense and the Terminal Guidance Warhead for the Multiple-Launch Rocket System.**