



## Space and Missile Defense Challenges: The Army's Role in This Nation's Emerging Missile Defense Architecture

(First in a series of three Background Briefs based on information  
obtained from U.S. Army Space and Missile Defense Command)

*Unlike the Cold War, today's most urgent threat stems not from thousands of ballistic missiles in Soviet hands, but from a small number of missiles in the hands of states for whom terror and blackmail are a way of life. They seek weapons of mass destruction to intimidate their neighbors, and to keep the United States and other responsible nations from helping allies and friends in strategic parts of the world. . . . To maintain peace, to protect our own citizens and our allies and friends, we must seek security based on more than the grim premise that we can destroy those who seek to destroy us. This is an important opportunity for the world to rethink the unthinkable, and to find new ways to keep the peace.*

**President George W. Bush**  
**National Defense University, May 2001**

At the opening of the 21st century, nearly 30 countries have ballistic missiles and 14 produce and/or export those missiles and related technology. As the President said, some of these countries are among the world's least-responsible states. Countries like Iraq, Iran and North Korea have missiles that directly threaten our Army's ability to deploy and support American forces in a crisis as well as troops, allies and friends overseas, and they are developing capabilities to threaten American civilians at home.

The events of 11 September emphasize the fact that the missile threat to the homeland includes not only the ballistic missiles of these "states of concern," but other air threats in the hands of transnational, nonstate actors—in a word, terrorists. A hijacked airliner is, in effect, a cruise missile. A more sophisticated attacker could easily build or buy on the open market an assortment of unmanned aerial vehicles or cruise missiles. The trend is toward weapon systems with increased accuracy and greater lethality. Accuracy improvements will result from technological sophistication, while lethality increases result from employment of weapons of mass destruction including nuclear, biological and chemical warheads.

### Developments Since the Gulf War

In the decade since Army Patriot battalions fought missile defense battles against Iraqi SCUDs in the Gulf War, the Army and the other services have made steady progress toward the goal of a fully integrated joint air and missile defense family of systems for protection of U.S. and allied military forces and facilities overseas. The Army has demonstrated the *active defense* capability to reliably hit a missile in flight with an interceptor ("hit-to-kill" technology) in multiple tests of the Patriot Advanced

Capability-3 (PAC-3); with the longer-range Theater High Altitude Area Defense System (THAAD); and with the ground-based interceptor of the national missile defense (NMD) system. In coordination with Germany and Italy, the Army is developing the next-generation Medium Extended Air Defense System (MEADS). Directed Energy weapons have been proven feasible by Space and Missile Defense Command's successful development of a Tactical High Energy Laser, which engaged and destroyed 25 Katyusha rockets during tests at White Sands Missile Range, New Mexico, and could be deployed if needed.

The Army is also demonstrating the value added of an elevated sensor, the Joint Land Attack Cruise Missile Defense Elevated Netted Sensor (JLENS) system, to detect and track low-flying cruise missiles and to support the development of the Single Integrated Air Picture (SIAP). To enhance *attack operations* capability, the range of the Army Tactical Missile System (ATACMS) is being extended, forcing adversaries to move their missile launchers and associated command and control systems further away from our forces, reducing their lethal battlespace. Advances in information, space and sensor technologies are collectively providing opportunities to improve surveillance and focus reconnaissance in support of joint attack operations.

*Passive defense*, including early warning and dewatering of impending missile attack and possible resultant chemical, biological or nuclear effects, has been greatly improved by the forward deployment of the Joint Tactical Ground Stations (JTAGS) to Europe and Korea. These provide regional commanders in chief (CINCs) an in-theater capability to receive, process and disseminate space-based infrared sensor information on ballistic missile launches. And theater missile defense *battle management* techniques and procedures are being developed, tested and implemented by the 32<sup>nd</sup> Army Air and Missile Defense Command (AAMDC) and the 263d AAMDC (South Carolina Army National Guard), performing theater-level air and missile defense planning, integration, coordination and execution functions for the Army Forces/Joint Force Land Component Commander.

Missile defense is, however, an inherently joint mission. Several major joint initiatives are being pursued to evolve previous theater missile defense (TMD) capabilities into joint theater air and missile defense (JTAMD). These involve the capability to develop, disseminate and exploit a SIAP; improved combat identification to protect friendly platforms and eliminate the restrictive rules of engagement currently imposed on ground-based systems; automated battle management aids to reduce the timelines in assessing threats and prosecuting engagements; integrated fire control to assure tactical units use the optimal weapon to prosecute the engagement; and a joint defensive planner to assure that tactical commanders implement the most capable defense to achieve the warfighters' force protection objectives.

At the strategic level, the Department of Defense (DoD) has recognized that the national missile defense problem, much like the TMD problem, must be addressed by a multilayered capability to counter intercontinental ballistic missiles and other missile and aerial threats to the homeland in their boost, mid-course and terminal phases of flight. The architecture for a comprehensive system of systems encompassing sea-, air-, space- and land-based weapons and sensors is currently under development.

As the Lead Service (less acquisition), the Army will field, operate and sustain the Ground-based Midcourse Defense System (GMDS), the ground component of NMD. Program funding is provided by the Ballistic Missile Defense Organization (BMDO), and the NMD Program Executive Officer (PEO) reports to the Director, BMDO. U.S. Army Space and Missile Defense Command is the combat developer, with responsibility for identifying, coordinating and documenting the doctrine, training, organizational and operational requirements for the GMDS. The Army Corps of Engineers is responsible for deployment planning and site preparation. In keeping with its traditional mission of homeland defense, units of the Army National Guard from many states will operate the system under the command and control of the Commander in Chief, U.S. Space Command.

## Evolution to Integrated Missile Defense

The Bush administration, in the 2001 Quadrennial Defense Review report, has identified defense of the U.S. homeland as DoD's primary mission. This is followed by deterring aggression forward, swiftly defeating aggression in major overlapping conflicts if deterrence fails, and conducting a limited number of smaller-scale contingency operations. Among the "critical operational goals" of DoD transformation, therefore, are the protection of key bases of operation—the U.S. homeland, military forces abroad, allies and friends—from chemical, biological, radiological, nuclear and enhanced high explosive (CBRNE) weapons and their means of delivery; protection and sustainment of deployed U.S. forces' lines of communication; and defeating anti-access and area-denial threats to those forces.

The missile defense mission, therefore, is evolving beyond distinct strategic and theater missions to one of *Integrated Missile Defense* (IMD) that extends in one comprehensive, multilayered architecture from the continental United States to regional missile defense of forces or allies supporting our operations, to direct support of U.S. and allied forces in the theater of operations. IMD will encompass preemptive attack operations (both pre- and postlaunch attack of enemy missile launchers and supporting infrastructure); boost-phase, mid-course and terminal active defenses including ground-based, space, sea and airborne sensors, interceptors and directed energy weapons against postlaunch ballistic missiles; passive defense measures, primarily early warning; and a battle management system to integrate missile defense operations at all levels of conflict.

This Integrated Missile Defense will be a joint effort, executed by the CINCs with assets from all the services:

- ◆ The Army's contribution will include GMDS, Patriot PAC-3, THAAD, MEADS and short-range air defense (SHORAD) systems, attack aviation and artillery, early warning and dewarning systems, and their associated sensors and communications networks. As transformation of the Army proceeds, new weapons and "leap-ahead" technologies will be incorporated into the Objective Force.
- ◆ The other services are also developing promising components of the layered missile defense system, including Air Force airborne laser (ABL) and space-based laser (SBL) and the Navy's area and theater-wide missile defense systems to be deployed on Aegis ships. DoD also plans for a Pacific "testbed," including the Army's missile test range at Kwajalein, which will provide facilities for more frequent, realistic and challenging testing of various systems.
- ◆ The Joint Theater Air and Missile Defense Organization (JTAMDO), working closely with the CINCs and services, has developed a 2001 JTAMD Master Plan which documents the work done to date on a Joint TAMD Operational Concept, a 2010 Integrated Architecture, Joint Capabilities and Joint Acquisition Roadmaps, and analysis and demonstration objectives. The Joint Staff, JTAMDO, BMDO and the services are now examining how JTAMDO can expand its focus from TAMD to the development of Air and Missile Defense Operational Concepts and Operational Architectures.
- ◆ Joint Forces Command (JFCOM) has the mission to develop, explore and assess these new joint concepts, organizational structures and emerging technologies through experimentation to drive the doctrine, organization, training, materiel, leadership and personnel changes that will result in the optimal Future Joint Force Capability.

## Army Participation in Joint Efforts

The Army is deeply involved with the joint community—BMDO, JTAMDO, JFCOM and other organizations, as well as the warfighting CINCs—in defining and building the architecture of integrated missile defense at all levels, from strategic defense of the homeland against ballistic and cruise missiles

and aircraft, to regional and theater defenses of deployed forces, friends and allies. It is also working across all the operational pillars—active defense, attack operations, passive defense and battle management/command, control, communications, computers and intelligence. The Army Staff, U.S. Army Space and Missile Defense Command, the Army Training and Doctrine Command (TRADOC) Schools and centers, and others participate in numerous working groups, technology demonstrations, wargames, experiments and simulations.

The most familiar parts of the emerging architecture are the weapons and sensors—systems like the GMDS, the Space-based Infrared System (SBIRS), Patriot, THAAD, ATACMS, Comanche and Apache attack helicopters, JLENS, and so on. Integration, however, results principally from the battle management coordination—horizontally between systems and staffs, and vertically between echelons—of weapons, radars and decisionmaking nodes to ensure the most efficient and effective use of the air defense and missile defense resources available to the commander. The Army and its sister services continue to make progress in developing the SIAP, advanced means of combat identification of friends and foes, automated battle management decision aids to speed up the processing of data by machines and operators, and advanced weapons including directed energy and other technologies. The joint community, with the Army and the other services, is developing the operational concepts, doctrine and the experimentation techniques needed to design, test and refine the most effective missile defense architectures that will contribute to the goals of Full Dimensional Protection of populations and military forces against weapons of mass destruction and Full-Spectrum Dominance of the battlespace in the 21st century.