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Space and Missile Defense Challenges:

Army Theater Missile Defense— Challenges for 2010 and Beyond

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

Progress—and change—since Desert Storm. Nearly a decade ago, Army Patriot interceptors fought the world's first active defense battles against ballistic missiles. Since the Gulf War, the Army and the other services have steadily progressed toward the goal of fully integrated joint theater missile defense (TMD). One Joint Tactical Ground Station (JTAGS) has been forward-deployed in Europe and another in Korea, providing those commanders in chief (CINCs) a limited in-theater capability to receive, process and disseminate space-based infrared sensor information on tactical ballistic missile launches. The Army has established the 32nd Army Air and Missile Defense Command, commanded by a general officer, to perform theater-level air and missile defense planning, integration, coordination and execution functions for the Army Forces/Joint Force Land Component Commander. The range of the Army Tactical Missile System (ATACMS) is being extended, forcing our adversaries to pull their missile launchers and associated command and control systems further back from our forces. The Army is demonstrating the warfighting value-added of an aerial sensor, the Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS), to detect and track low-flying cruise missiles and to act as a communications relay. Today, continental United States (CONUS)-based computer models and simulations virtually train TMD forces deployed overseas. Most recently, the Army has successfully conducted hit-to-kill intercepts of ballistic missiles with both Patriot Advanced Capability 3 (PAC-3) and Theater High Altitude Area Defense (THAAD), proving the technology required for complete negation of chemical and biological warheads. PAC-3 has been approved to move into Low Rate Initial Production and THAAD is preparing to move into the Engineering, Manufacture and Development phase. The Army is also working very closely with the Navy and Air Force to ensure its TMD systems are interoperable with theirs. In short, the Army TMD team is on track to provide reliable, multitiered, robust theater missile defense against much of the threat set as we move into the 21st century.

The Army is also looking ahead to longer-term joint and combined TMD needs. These needs stem from a threat which has evolved to a family of increasingly capable theater ballistic missiles, land attack cruise missiles, rockets and unmanned aerial vehicles. Adding to this is the ability of many of these systems to deliver weapons of mass destruction. It is this varied threat set that is driving the evolution of joint and Army TMD in the following areas:

- *TMD has evolved into Joint Theater Air and Missile Defense (JTAMD).* There is increased emphasis on jointness and combined operations. Interoperability, sensor netting, integrated fire control, a single integrated air picture, and combat identification are emphasized when determining requirements.

- *A variety of engagement options against an expanded threat set are being analyzed.* There is a need to intercept and destroy shorter-range ballistic missiles and rockets, and there is a need to intercept land attack cruise missiles at longer ranges, destroying them over enemy territory or, as a minimum, before they can disperse weapons of mass destruction (WMD) over friendly forces.
- *Strategic deployability and tactical mobility are receiving renewed emphasis.* Assured access for our forces is a growing concern. The emerging capstone concept places a premium on getting to the fight rapidly, quickly organizing and transitioning into combat operations to thwart antiaccess strategies.
- *There is continued improvement of attack operations against time-critical ground targets.* Advances in information, space and sensor technologies are collectively providing opportunities to improve surveillance and focused reconnaissance in support of attack operations. Improvements in munitions ranges, selection, accuracy and lethality among all services are also enhancing attack operations capabilities.

Joint TMD for 2010 and beyond. Four representative efforts illustrate the Army's broad-based approach to tomorrow's TMD. Each is being developed in the context of joint and combined operations, while leveraging the Army's core competencies in land-based air and missile defense operations, and the Army's space support to land force operations.

- *The Joint Land Attack Cruise Missile Defense Elevated-Netted Sensor System (JLENS).* JLENS, an Army-led, joint Acquisition Category II program, is being developed to provide lightweight, advanced technology, three-dimensional surveillance and precision track and illumination radars for the detection of low-flying cruise missiles and other airborne and ballistic missile targets. Additionally, it can act as a communications relay. JLENS consists of a sensor and communications package attached to the underbelly of a 71-meter tethered aerostat. JLENS passes target tracks and data to air defense systems on the ground, at sea or in the air, so cruise missiles and other airborne threats can be countered. In so doing, JLENS provides joint services the ability to share over-the-horizon radar data across a series of communication networks and defense platforms. The JLENS Joint Project Office plans to have an aerostat prototype ready as early as 2005, and production models in 2010. The Department of Defense (DoD) plans to fund a total of 15 complete JLENS systems, of both fire control and surveillance radars—a total of 30 aerostats.
- *Directed Energy Weapons.* The Tactical High Energy Laser (THEL) is a cooperative program with Israel to develop a transportable air defense weapon system demonstrator designed to counter terrorist attacks from Katusha and similar artillery rockets which threaten urban areas. A THEL will be able to fire with the speed-of-light flyout for close-in engagements where time lines are very short. Though the effectiveness of high energy lasers against short-range rockets has been tested and demonstrated in very controlled environments, the THEL demonstrator will provide the first opportunity to assess the utility of high-energy lasers in an operational scenario. Participation of the U.S. Army in field testing in Israel of the THEL demonstrator will provide valuable operational data for determining future applicability of directed-energy candidates to documented shortfalls in the ability to effectively counter this target set.
- *Medium Extended Air Defense System (MEADS).* MEADS, an international cooperative initiative, will defend the maneuver forces and fixed assets from short-range ballistic missiles, cruise missiles and other air-breathing threats such as aircraft or unmanned aerial vehicles. The role of MEADS in the ballistic missile defense architecture will be to bridge the gap between man-portable systems like the Stinger and the higher levels of the missile defense structure like PAC-3 or the THAAD system while providing continuous coverage for rapidly advancing maneuver forces.

- *Battlefield Ordnance Awareness (BOA)*. BOA is a U.S. Army Space and Missile Defense Command program for application of modern space-based and aircraft-mounted sensor technology to address the needs of the Army warfighter. This unique sensor application will collect and process ordnance event data (e.g., time, type, rate and precise location) and provide this information to the commander in real time. This information will be useful for targeting, intelligence preparation of the battlefield, battlefield damage assessment and even friendly ordnance expenditure. For TMD this capability will assist in attack operations following the launch of ballistic missiles and large caliber rockets.

Stay the course . . . support efforts to find new solutions. The Army continues to support the joint and combined focus on multielement TMD, acknowledging the need to fight TMD in coordination with ground and aerial air defense. Such fundamental requirements as a single integrated air picture, interoperable systems, and redundant, robust and survivable high-capacity communications are essential. Also essential are the continuing development of the Army's multitier approach to active defense and the integration of that capability into sea-, air- and space-based capabilities. Progressively evolving joint capabilities into a family of systems will ensure we stay on the path to full-dimensional protection as described in the joint operational vision.