Unclassified Statement of

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Subcommittee on Strategic Forces

Regarding the

European Phased Adaptive Approach (EPAA)

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Good afternoon, Chairman Langevin, Ranking Member Turner, other distinguished Members of the subcommittee. It is an honor to testify before you today on the status of the European Phased Adaptive Approach (EPAA) for missile defense of our homeland, deployed forces, and NATO European allies. The Missile Defense Agency (or MDA) is committed to disciplined management to rapidly and efficiently create effective missile defense capability in four phases paced by progress in technology achievement, product development, and testing. The resulting highly integrated missile defense system will provide robust missile defense using advanced ground, airborne, seaborne, and space-based sensors and a combination of interceptors leveraging multiple intercept opportunities against Short-, Medium-, and Intermediate-Range Ballistic Missiles (SRBMs, MRBMs, and IRBMs) and Intercontinental Ballistic Missiles (ICBMs) from current and projected regional threats. As stated in the Ballistic Missile Defense Review (or BMDR), our highest priority remains strengthening our homeland missile defense in all phases of the EPAA by restarting our Ground Based Interceptor (GBI) production lines, upgrading our interceptor launch systems, expanding the network of sensors, enhancing the command and control of the Ground-based Midcourse Defense (GMD) system, and developing a new interceptor that will add an early intercept capability to our homeland defense arsenal against regional threats: the SM-3 IIB. Over the past year we have made significant progress and, combined with the results of the Joint Staff missile defense

capability (inventory) analysis and Combatant Commander's operational plans, our plans meet the policy objectives as described in the BMDR. I report to you that we are executing all of our program management baselines in accordance with the timelines announced by the President in September 2009 for the EPAA.

A robust missile defense architecture requires layers of sensor and interceptor systems integrated by a command, control, and communications network in order to have multiple threat missile tracking and intercept opportunities. The United States proposes its contribution to the missile defense of NATO Europe be U.S. "upper tier" missile defense systems (Aegis BMD and the AN/TPY-2 forward-based radar), which will typically provide the first opportunity to intercept MRBMs and IRBMs. Lower tier missile defense systems, provided by the United States and our NATO Allies and integrated with our territorial missile defense systems through the expansion of NATO's Active Layered Theater Ballistic Missile Defense, or ALTBMD, command and control system, would provide the second, or third, shot opportunity for the effective protection of European NATO countries.

Most of the capability required for the EPAA has been studied or developed by MDA for several years. These capabilities include the land-based SM-3, which is being developed under the name Aegis Ashore, the Standard Missile (SM) - 3 IB and IIA, the Airborne Infra-Red (ABIR) sensor, and Precision Tracking Space System (PTSS) programs. The only new program start resulting from the EPAA, the SM-3 IIB interceptor, was driven by the need for an early intercept capability against MRBMs and IRBMs and a hedge to augment homeland defense against future potential ICBMs launched by today's regional adversaries.

EPAA Phase 1 Progress

Starting in 2011, Phase 1 capability will provide initial protection of southern Europe from existing SRBM and MRBM threats using sea-based interceptors and SPY-1 radars, missile defense command and control suites, and a forward land-based AN/TPY-2 radar. Phase 1 sensors also will provide early tracking for GMD for improved homeland defense if an intercontinental missile threat emerges from the Middle East.

Phase 1 Aegis Ballistic Missile Defense (BMD) FY 2010 Progress. Multiple BMD-capable Aegis ships, equipped with the Aegis BMD 3.6.1 computer program, are already deployed with EPAA Phase 1 Aegis capabilities. During the past year, MDA completed installation of BMD capability on two Aegis cruisers, bringing the total number of U.S. BMD-capable Aegis ships to 20. We delivered all 26 FY 2010 SM-3 IAs six months ahead of schedule and are running four months ahead of schedule for FY 2011 deliveries. Additionally, in October, the Japanese conducted the 10th intercept using the SM-3 IA interceptor.

Phase 1 Sensors FY 2010 Progress. We have demonstrated increasing integration and capability of the AN/TPY-2 radar in 8 flight tests and 6 ground tests during FY 2010, including tests with the Patriot, THAAD, Aegis, and GMD systems. AN/TPY-2 radar (#4) environmental testing was completed nine months earlier than originally planned and that radar began refurbishment in August to be made available for deployment in Southern Europe next year as directed by the Joint Staff and the Office of the Secretary of Defense.

Phase 1 C2BMC FY 2010 Progress. Over the past year, we also completed development and entered qualification testing of Command, Control, Battle

Management and Communication (C2BMC) Spiral 6.4. This will enable control of multiple AN/TPY-2 radars and increase robustness for information assurance and computer network defense. In November 2009 and July 2010, we installed C2BMC hardware and software upgrades in command and control nodes at U.S. European Command (USEUCOM) to support Aegis operations. In July, we demonstrated NATO Active Layered Theater Ballistic Missile Defense interoperability with the U.S. C2BMC in Joint Project Optic Windmill. Deployment of C2BMC 6.2 began at U.S. Central Command in August. In early 2011, the BMDS C2BMC Spiral 6.4 will be installed in USEUCOM headquarters, also in support of Phase 1 operations.

FY 2010 Progress in Improving Homeland Defenses in Phase 1. During the past year, we restarted the dormant GBI production line and upgraded two of the original GBIs, and we will continue to replace the original interceptors with upgraded, or new, GBIs until the entire fleet of GBIs is incrementally replaced by 2015. In March, we installed a Ground-based Missile Defense fire control training node at Fort Greely to allow simultaneous operations and training of our Soldiers at the site. In May, we completed modifications to the Thule, Greenland Upgraded Early Warning Radar, which provides tracking capability of potential future ICBMs from the Middle East. In June, we conducted the 2-stage GBI flight test (BVT-01) as a potential hedge to allow for a longer intercept window of time if ICBMs were launched from Northeast Asia or the Middle East. In September, we emplaced the thirtieth GBI. Additionally, we emplaced all GBI silos and silo interface vaults in Missile Field 2 at Fort Greely, Alaska and will be ready to receive the first GBI in February 2012 and expand the total number of available GMD silos to 38 (30 operational silos with 8 available for additional GBIs, if warranted).

Phase 1 Support to USEUCOM FY 2010 Progress. MDA intensely interacts with the regional Combatant Commanders to conduct war games, exercises, and provide technical input for the development of contingency war plans. This past July, we conducted Joint Project Optic Windmill 2010 with our European allies and U.S. European Command (USEUCOM). USEUCOM used this exercise to explore joint concepts for the command and control of EPAA systems. We also participated in numerous war games and planning events during the year with U.S. Central Command, U.S. Strategic Command, and U.S. Northern Command.

EPAA Phase 2 Progress

During 2015, Phase 2 capability will be deployed to provide improved protection of southern Europe from ballistic missile threats with the deployment of the SM-3 IB (with Aegis BMD 4.0.1 software) and proven SM-3 IA interceptors at sea and at an Aegis Ashore site in Romania. Enhanced coordination and use of remote sensors by Aegis ships to launch interceptors earlier in an engagement will improve overall EPAA performance. During this timeframe we will focus technology development on prototype airborne sensor systems (carried on Remotely Piloted Vehicles or RPVs), enhanced command and control, and satellite sensor systems. EPAA Phases 2 and 3 will be supported by future C2BMC spirals to improve sensor management of multiple radars, deliver threat track information to Aegis BMD and Aegis Ashore, and improve connections to NATO command and control structures.

Phase 2 Aegis Ballistic Missile Defense (BMD) FY 2010 Progress. In October 2009, we simulated the intercept of two SRBM targets and 1 separating SRBM target using Aegis 4.0.1 software on the USS Lake Erie. Over the past year, we also conducted

ground tests of the SM-3 IB interceptor kill vehicle. This past August we awarded Lockheed Martin Maritime Systems and Sensors a contract (through April 2011) to provide the systems engineering and adaptation of the Aegis Weapon System equipment and computer programs for the Aegis Ashore configuration. From July through September, a joint U.S.-Romanian team assessed and evaluated candidate sites for Aegis Ashore in support of the State Department-led Ballistic Missile Defense Agreement negotiations. In October 2010, we completed the Aegis Ashore System Requirements Review. Also in October, we commenced at-sea operational testing of the Aegis BMD 4.0.1 system on the USS Lake Erie, which is scheduled for certification in FY 2011. The Aegis BMD 4.0.1/SM-3 IB combination brings improved capability against complex targets and increased raid capacity to the Navy's BMD-capable Aegis ships. Aegis BMD 5.0 (to be used in Aegis Ashore) with the SM-3 IA and IB interceptors, extends the Aegis BMD 4.0.1 capability into an open architecture computing environment integrated with the Navy's Aegis modernization program.

Phase 2 C2BMC FY 2010 Progress. We started engineering and design work on the next generation C2BMC, which will provide initial battle management aids for enhanced coordination of interceptor systems, multiple radars and infra-red sensors, and the integrated BMDS Overhead Persistent Infrared (OPIR) satellite architecture for improved cueing and early warning on boosting threats from satellites. In support of this, we also purchased Phase 2 communications equipment in 2010 for the Air Operations Center in Ramstein, Germany.

EPAA Phase 3 Progress

In 2018, we will deploy the SM-3 IIA interceptor on land in Poland as well as Romania and at sea and Aegis BMD 5.1 software to protect NATO European countries from SRBM, MRBM, and IRBM threats. System improvements include expanded interceptor system coordination and improvements to radar discrimination. We will deploy the Precision Tracking Space System (PTSS) and Airborne Infrared (ABIR) to simultaneously track large numbers of hostile ballistic missiles and enable earlier intercepts.

Phase 3 ABIRS Capability Development FY 2010 Progress. In 2010, MDA conducted key experiments with sensors on RPVs to assess alternatives for simultaneous tracking and discriminating large numbers of threat missiles in flight. From December through June, we executed five flight tests demonstrating sensor accuracy and passing real-time target tracks to ground stations. In October, we purchased four Multi-spectral Targeting System (MTS) infra-red sensors for higher fidelity testing of early missile tracking concepts. In June, we completed an analysis of alternatives with the Air Force that recommended continuing to use the Reaper RPV platform and the MTS class sensors for completing our ABIR concept development.

Phase 3 PTSS Capability Development FY 2010 Progress. Based on studies by MDA and Federally Funded Research and Development Centers and University Affiliated Research Centers, MDA presented a government concept for the acquisition of the PTSS to industry to facilitate competition for near-term production planning contracts. In July, we demonstrated the ability of the Space Surveillance and Tracking System satellites to acquire and track boosting missiles. In August, we demonstrated in

a laboratory environment the ability to pass satellite sensor generated missile tracks into the C2BMC that can be used by Aegis for launch on remote. We established Air Force and Navy Service Cells in August to ensure the PTSS will be successfully controlled by the Air Force and used by the Army and Navy to enhance Aegis, THAAD, and GMD capability. The Agency also completed preliminary analyses and trade studies leading to a successful PTSS System Concept Review in August.

Phase 3 Enhanced C2BMC Capability Development FY 2010 Progress. This past year we initiated development of an Integrated Sensor Manager that combines Airborne and Space sensors (including ABIR and PTSS) for experiments to validate impacts of these systems on our ability to track large raids of missiles In July, we awarded contracts to develop next generation Command and Control architectures and defined functional allocation to integrate PTSS into the BMDS. In August, we also awarded a contract to Purdue University for revolutionary research in reconfigurable networks.

EPAA Phase 4 Progress

In 2020, the Phase 4 architecture features the higher velocity SM-3 IIB interceptor and enhanced command and control system to provide early intercept capability against large raids of MRBM and IRBM missiles and potential ICBMs emerging from today's regional ballistic missile threats. The SM-3 IIB will be the first layer of our homeland defense system with GMD providing the second layer to enhance overall probability of intercepting ICBMs from different missile defense systems.

Phase 4 SM-3 IIB Capability Development FY 2010 Progress. In 2010, we completed an initial government assessment of technology readiness and the desired SM-3 IIB performance characteristics. We assessed alternative missile architectures

and technologies to define trade space across cost, risk, and missile performance to establish feasible and affordable missile requirements. In August, we completed a System Concept Review, which defined the engineering trade space for concept development and identified priorities for technology risk reduction to be completed prior to product development. In September, in partnership with the Navy, we completed the first phase of a feasibility assessment on concepts to modify the launcher modules of the Aegis MK 41 Vertical Launcher System to accommodate the SM-3 IIB missile.

THAAD FY 2010 Progress

While it is not a part of the EPAA, Terminal High Altitude Area Defense (THAAD) will be available for deployment globally. In February, THAAD completed its ground component testing involving natural environments. The first THAAD battery completed the Force Development Experiment last February and, in June, we completed the Limited User Test to validate initial operational capability. Also in June, we intercepted a target representing the shortest range threat that could be engaged by THAAD while injecting nine simulated SRBMs into the THAAD radar processor. In July and August, THAAD completed mobility and safety and electromagnetic environment effects testing in support of the Army's THAAD Materiel Release decision in early 2011. This decision will determine whether THAAD is safe for soldiers to operate, suitable for use, supportable, and represents the formal acceptance of the first THAAD battery by the Army. In August, we also completed delivery of the hardware for the second THAAD battery, integrated it with the AN-TPY-2 radar, and began training. In September, we awarded the THAAD initial production contract for 26 interceptors and batteries 3 and 4 ground systems.

FY 2010 Testing Progress

In FY 2010 the Agency, in full collaboration with Combatant Commands, Service Operational Test Agencies, the Director, Operational Test & Evaluation, and the Director, Developmental Test & Evaluation, developed and approved the Integrated Master Test Plan (IMTP) versions 10.1 and 10.2, which aligned the missile defense test program to the EPAA phases for proven capability delivery. MDA is working closely with USEUCOM and Joint Forces Component Command Integrated Missile Defense to develop test plans and test designs for flight and ground testing to collect data necessary to assess Phase I capability by the end of 2011 in support of Joint Staff and OSD for Phase I. War fighters operate our missile defense systems during all of our flight tests under simulated wartime conditions using approved concepts of operation and tactics, techniques and procedures. IMTP 10.2 includes all testing requirements for EPAA Phases 1 through 3, which include 72 flight tests and 107 ground tests from FY 2010 through FY 2021.

There are several major test activities in support of EPAA Phase 1 assessment during FY 2011. This spring we will conduct FTM-15 to intercept an IRBM target using the EPAA Phase 1 architecture, including a SM-3 IA interceptor, forward-based AN/TPY-2 radar, and EPAA Phase 1 C2BMC and Aegis software configurations. We are conducting two critical ground tests to demonstrate the EPAA Phase 1 capability to defend European allies and deployed forces from multiple and simultaneous SRBM and MRBM threats: Ground Test Integrated-04d (3Q FY 2011) is a hardware-in-the-loop system level test, and Ground Test Distributed-04d (4Q FY 2011) uses operational communications and equipment. Additionally, in support of Phase 2 assessment, MDA

also will conduct FTM-16 (2 events) in FY 2011 to demonstrate Aegis BMD 4.0.1 and the SM-3 IB missile.

FY 2010 EPAA Acquisition Strategies and Contract Actions

MDA has several acquisition strategies and on-going contract actions supporting the Phased Adaptive Approach, including Aegis Ashore, Targets, the SM-3 IIB, Precision Tracking Space System, Airborne Infra-Red, and Directed Energy Research.

Aegis Ashore Acquisition Strategy. We are leveraging existing and future contracts through MDA, the Navy, and the Army to procure Aegis Ashore elements. A systems engineering and adaptation of the Aegis Weapon System equipment and software has been initiated.

Targets Acquisition Strategy. In order to test the EPAA, we must provide low cost, highly reliable targets for successful BMDS and element data collection and intercept tests by using common components to achieve efficiency and reliability. The Agency developed the IMTP to support validation of all BMDS models and simulations and, specifically, the EPAA. We are procuring IRBM and ICBM targets to support requirements through the Future Years Defense Plan, to include baseline manufacturing configurations, complex target configurations, and unique target configurations procured in low unit quantities. Each target class will be solicited, evaluated, and awarded independently to meet the requirements in the IMTP. We are on track to award a contract for IRBM target procurement in the second quarter of FY 2011 to support EPAA phases 1 through 3 and operational testing. We anticipate a fourth quarter FY 2011 contract award for ICBM target procurement in support of phases 2 and 3 and operational testing.

SM-3 IIB Acquisition Strategy. In early FY 2011, MDA plans to award three competitive concept definition and program planning contracts to define and assess viable and affordable missile configurations, conduct trade studies, and define an executable development plan. One of these three companies will be selected in 2013 to complete the design and begin flight testing the SM-3 IIB in 2016. In parallel with our concept definition efforts, we are developing technologies with component vendors to mature key critical technologies to increase missile performance prior to the Product Development Phase, which begins in early 2013.

Precision Tracking Space System Acquisition Strategy. We are using existing MDA and external contract vehicles from the Air Force, Navy, and the Department of Energy to execute PTSS trade study and system engineering efforts. To support MDA's goal of developing the PTSS system to address the ascent phase midcourse-tracking mission in a cost-effective manner, PTSS will be developed in two distinct capability phases, each with its own acquisition strategy. The first capability will be the System Prototype Baseline Design. Five contractor teams will be selected to participate in prototype development. The second capability phase will be the production of the PTSS System. We plan to conduct a Preliminary Design Review in the fourth quarter of FY 2011. MDA will acquire the Production PTSS constellation through a down-select to one of the participating contractors in FY 2014.

Airborne Infrared Acquisition Strategy. We will demonstrate an airborne solution to prove forward-based fire control and raid size handling using Multispectral Targeting System family infrared sensors and the MQ-9 Reaper RPV. Upon successful demonstration, we will work with our Service partners on long-term acquisition and

deployment strategies. In the near-term, we will use the Air Force and Navy contracts to do initial risk reduction, develop and buy sensors, and execute flight testing. Beginning in first quarter of FY 2011, we will modify ABIR platforms and sensors for experimentation.

Summary

The Department is on track to meet key milestones in the development of homeland missile defense and the President's Phased Adaptive Approach to deploy missile defenses in Europe against a growing and increasingly sophisticated ballistic missile threat. Planned EPAA capability deliveries and development efforts reflect the war fighting priorities of the U.S. European Command. We have established clear baselines for the product development of all ballistic missile defense capabilities, which I believe will enhance rigor and discipline in our acquisitions and provide better control of BMDS cost, schedule, and technical performance. We also are developing potential technological solutions to EPAA capability shortfalls with analysis and technology development activities for the deployment of precision tracking sensors in space and a new higher velocity interceptor on land and at sea. Finally, to help ensure capabilities we deliver have been adequately proven, the Integrated Master Test Plan documents BMDS testing requirements for the EPAA phases in full partnership with independent testers and the war fighter.

Thank you and I look forward to answering your questions.