Unclassified Statement of

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Before the

Senate Appropriations Committee
Defense Subcommittee

Regarding the

Fiscal Year 2012 Budget Request
Ballistic Missile Defense Programs

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Good morning, Chairman Inouye, Ranking Member Cochran, other distinguished Members of the subcommittee. I thank you for the opportunity to testify today on the Missile Defense Agency's (MDA) $8.6 billion Fiscal Year (FY) 2012 budget request to develop protection for our Nation, our Armed Forces, allies, and friends against a growing threat - the proliferation of increasingly capable ballistic missiles of all ranges. We continue to test and improve the reliability and performance of our homeland and regional missile defenses to defeat a growing variety of ballistic missiles over the next decade while posturing our Nation to respond to the uncertainties in estimates of future missile threats. By the end of FY 2012, we will complete the initial fielding of the Ground-based Midcourse Defense (GMD) system for homeland defense against first generation Intercontinental Ballistic Missiles (ICBMs) potentially being developed by current regional threat actors. We will also continue our initial fielding of regional defenses against today's short-range (1,000 km or less), medium-range (1,000 to 3,000 km), and intermediate-range ballistic missiles (3,000 to 5,500 km), or SRBMs, MRBMs and IRBMs, respectively.

Fiscal Year 2010 Accomplishment Highlights

During this past year, we have improved our homeland defense by emplacing the 30th Ground Based Interceptor (GBI), upgrading two additional GBIs, installing a training node at Fort Greely, Alaska (FGA), and completing a significant upgrade of the Early Warning Radar in Thule, Greenland. Additionally, we had a successful two-stage

Ground Based Interceptor (GBI) booster test and conducted a three-stage GBI intercept test where we did not achieve our primary objective, but we did demonstrate integrated sensors and command, control, battle management, and communication (C2BMC) during the longest range flight test to date. In FY 2010, we also improved our regional defenses by converting two Aegis BMD ships, delivering 25 SM-3 IA interceptors, and increasing the Aegis BMD fleet to 20 operationally configured BMD ships. Aegis BMD ships carrying SM-3 IA interceptors are currently deployed and on-station in forward operating areas, including the USS Monterey as part of the first phase of the European Phased Adaptive Approach (EPAA). We also commenced production of Terminal High Altitude Area Defense (THAAD) Batteries 3 and 4 and the associated interceptors. We accelerated the refurbishment of an AN/TPY-2 radar for phase 1 of the EPAA and installed a C2BMC system and prepared a second AN/TPY-2 for deployment to U.S. Central Command. Moreover, we successfully flew 14 target missions, including a successful intercept of a separating MRBM with our Japanese allies using an SM-3 IA interceptor (thus completing the first BMD Foreign Military Sales (FMS) case), and conducted a successful intercept of a unitary SRBM with THAAD. For future capabilities, we demonstrated the ability of the two Space Tracking and Surveillance System (STSS) satellites to provide stereo, high-fidelity tracking capabilities and transfer tracks into C2BMC. Our Airborne Laser Test Bed successfully destroyed two boosting ballistic missiles. We achieved our goal of demonstrating NATO Active Layered Theater Ballistic Missile Defense interoperability with the U.S. C2BMC in Joint Project Optic Windmill. Finally, we completed U.S. and Israeli Government project agreements on the Arrow 3 Upper Tier Interceptor, the David's Sling Weapon System,

and an Israeli Test Bed. Recently, we supported Israel's successful intercept mission of a separating threat missile off the coast of California.

Enhancing Homeland Defense

MDA's top priority is to confirm the root cause of the most recent GBI flight test failure, verify the resolution of the problem, and successfully execute the previous flight test. The Failure Review Board (FRB) has identified the most likely cause, but more ground testing this summer and an additional non-intercept flight test in FY 2012 of an upgraded GBI Exo-atmospheric Kill Vehicle (EKV) will be required before the next intercept in late 2012. We suspended production of the latest version of the EKV until the required design modifications are completed and verified, and we diverted FY 2011 GMD funding to expedite these modifications. Until we can resolve this technical issue, advancement of our GMD capability is primarily limited by technical progress, not funding.

Initiation of activities to quickly recover from the GMD flight test failure caused us to revise our proposed FY 2012 GMD schedule of work after we developed the current FY 2012 President's Budget Request. By deferring lower priority FY 2011 activities not associated with the flight test failure resolution, we were able to rapidly begin our resolution of the GMD flight test issues; however, we still need the requested $1.16B for FY 2012 to complete the test failure resolution and the initial fielding of the defense of our homeland against limited ICBM attacks, including the completion of the hardened power plant and Missile Field 2 at Ft. Greely Alaska.. During the suspension of EKV production, we will accelerate the refurbishment of the existing GBI fleet, and also begin acquiring material needed to produce new GBIs to meet our minimum requirement of 26

operational GBIs at FGA, 4 at Vandenberg Air Force Base (VAFB), California, and 22 GBIs for testing, stockpile reliability testing, and spares. Given the two flight test failures, the need for a new non-intercept flight, and a repeat of the last flight test, we will assess the procurement quantity of additional GBIs as part of the FY 2013 President's Budget Request after we have confirmation that we have resolved the EKV issue. As a hedge against uncertainties in ICBM threat estimates, we will place Missile Field 1 in a storage mode for possible upgrade for operational use in the future. Additionally, we will complete the construction of a second fire control node at FGA to allow testing or exercises to be conducted while simultaneously controlling the operational system. We will also begin the planning, design and environment work for a GBI In-Flight Interceptor Communication System (IFCS) Data Terminal (IDT) on the east coast of the United States by 2015. This East Coast IDT will enable communication with GBIs launched from FGA and VAFB on longer flights, thus improving the defense of the eastern United States against potential ICBM threats from the Middle East. Finally, we are requesting $177.1M in RDT&E funding for the Sea-Based X-band (SBX) radar in FY 2012, which includes software upgrades to improve its discrimination capability.

In addition to GMD upgrades, we are requesting $222.4M in FY2012 for BMDS Sensors for homeland defense, including support of the Upgraded Early Warning Radars (UEWRs) and AN/TPY-2 radars. Integration of the Thule, Greenland radar in FY 2012 will make it a fully operational UEWR in the BMDS. We will begin upgrade of the Clear Early Warning Radar in Alaska for full missile defense capability by 2016. In addition, a forward-based AN/TPY-2 X-band radar will be deployed to southern Europe

to provide early tracking for both enhanced homeland and regional defense. We will continue to upgrade system software to address new and evolving threats, including enhancing Exo-atmospheric Kill Vehicle discrimination algorithms by 2015, improving GBI avionics, and increasing GBI interoperability with the Command and Control, Battle Management and Communications (C2BMC) system.

After last year's successful initial flight of a two-stage GBI, we plan to conduct an intercept flight test with a two-stage GBI as a potential hedge to allow for a longer intercept window of time if ICBMs were launched against the United States from Northeast Asia or the Middle East. However, as a consequence of the need to repeat the failed three-stage GBI flight tests, we plan to delay the first intercept test of the two-stage GBI from FY 2012 to FY 2014. Finally, we will continue development of the Standard Missile 3 (SM-3) IIB to complement the GMD system's protection of our homeland in the future by adding an additional layer of ICBM defense, which will provide an early intercept capability against first generation ICBMs within the regions from which they were launched.

Hedge for Protection of the United States

Today, 30 operational GBIs protect the United States against a medium ICBM raid size launched from current regional threats. If this capability is determined to be insufficient for protection of the U.S. homeland based on intelligence estimations of future threats, we have options to increase the number of operational GBIs and accelerate the delivery of new sensor and interceptor capabilities. The Department is committed to brief Congress soon on the results of our ongoing BMD analysis and our recommended hedge strategy.

Enhancing Regional Defense

We are also currently deploying our initial missile defense capability against SRBMs, MRBMs, and IRBMs. Over the next decade, we are enhancing this initial capability by developing increasingly capable missile defenses that can be adapted to the unique circumstances of each Combatant Command region. In regions where ballistic missile threats are a concern, the United States will tailor Missile Defense Phased Adaptive Approaches (PAAs) (like the European PAA, or EPAA) to plan the establishment of command and control, sensor, fire control, and interceptor infrastructures to provide fundamental defenses and facilitate the effective surge of transportable missile defense assets to their regions when needed.

The EPAA focuses on addressing missile defense interoperability with NATO and our allies and partners as the threat from the Middle East is anticipated to increase over the next decade. In November 2010, NATO Heads of State and Government agreed to develop an Alliance territorial missile defense capability to "provide full coverage and protection for all NATO European populations, territory and forces against the increasing threats posed by the proliferation of ballistic missiles." The United States has committed to provide the EPAA as a national contribution to this capability, built on the Active Layered Theater Ballistic Missile Defense (ALTBMD) command and control system, and we are encouraging our allies to field and provide national capabilities as well.

Phase 1: Initial SRBM, MRBM, and IRBM Defense in Europe - to be completed by the end of 2011. In this phase, our goal is to achieve an initial missile defense capability in Europe using the Aegis BMD 3.6.1 weapon system with SM-3 IA

interceptors, forward-based AN/TPY-2 and SPY-1 radars, and the C2BMC system at Ramstein Air Force Base, Germany, which will improve connections to NATO command and control structures. The USS Monterey is at sea today and, when paired with the AN/TPY-2 radar, will provide initial BMD protection of southern Europe from existing SRBM, MRBM and IRBM threats. While no decision on the location of the radar has been made, we expect to meet our 2011 deployment timeline. Additionally, THAAD batteries will be available for deployment in this and subsequent phases. The Army activated a second THAAD battery in October 2009, which is scheduled to complete training by the end of calendar year 2011. We are requesting $290.5M in RDT&E funding to enhance communications and enable THAAD's launch-on-sensor network capability, which will allow THAAD to intercept threat missiles tracked by many different missile defense sensors. We also request $833.2M for the production of 63 THAAD interceptors, six launchers, and one Tactical Station Group to be delivered by FY 2014, and $380.2M for the production of two AN/TPY-2 radars. A critical EPAA phase 1 milestone was achieved in March 2011 when an IRBM range target was intercepted in the Pacific by a SM-3 IA interceptor using the current Aegis fire control system and the EPAA forward based AN/TPY-2 and Command and Control architecture. Additionally, we will conduct two critical ground tests this year to demonstrate the EPAA Phase 1 capability for defending European allies and deployed forces from multiple and simultaneous SRBM and MRBM threats.

Phase 2: Enhanced MRBM Defense in Europe by 2015. Our goal in this phase is to provide a robust capability against SRBMs and MRBMs by launching several different interceptors to engage each threat missile multiple times in its flight. This architecture

includes the deployment of the Aegis BMD 4.0.1/5.0 weapon fire control systems with SM-3 IB interceptors at sea and at an Aegis Ashore site at Deveselu Airbase in Romania. When compared to the current SM-3 IA, the IB will have an improved two-color seeker for greater ability to discriminate threat Reentry Vehicles from other objects, and it will have improvements to enhance reliability and producibility of the SM-3 IB's divert and attitude control system. These improvements also provide greater capability against larger sized raids. Later this summer, we will demonstrate Aegis BMD 4.0.1 fire control and the first flight test of the SM-3 IB interceptor. We are requesting $565.4M for the production of 46 SM-3 Block IB interceptors to be delivered by FY 2014 and $960M for Aegis BMD to fund continued development and testing of the SM-3 IB as well as upgrades to Aegis 5.0 fire control software to support the operation of the SM-3 IB and IIA interceptors and associated flight tests. In FY 2012, we are requesting $306.6M to begin acquiring Aegis Ashore Missile Defense Systems (land-based SM-3) batteries—one for testing at the Pacific Missile Range Facility (PMRF), and one for deployment in Romania by FY 2015. We request $364.1M for the C2BMC program for continued development of software and engineering to incorporate enhanced C2BMC capability into the C2BMC battle management architecture and enable interoperability among the BMDS elements, incorporate boost phase tracking, and improve system-level correlation and tracking.

Phase 3: Enhanced IRBM Defenses in Europe by 2018. Key to achieving more cost-effective missile defense, expanding the engagement range of our interceptors, improving discrimination and enabling early intercepts of ballistic missiles is our phase 3 sensor strategy. This strategy is based on complementing our forward based AN/TPY-2

radars with the development and deployment of the Precision Tracking Space System (PTSS) satellites, enhanced Airborne Infrared (ABIR) capability, and the algorithms to rapidly fuse all our data sources to provide the most precise tracking for the GMD, Aegis BMD, and THAAD fire control systems. The PTSS is the principal capability in this sensor strategy as, unlike AN/TPY-2 and aircraft that require host nation and over flight permissions respectively, the PTSS will provide assured, persistent capability to detect and track large raid sizes of hostile ballistic missiles over their entire flight in the Northern Hemisphere and enable earlier engagements to improve both homeland and regional defense. In sum PTSS provides three to six times the simultaneous tracking capability of the AN/TPY-2 radars or ABIR Combat Air Patrols at a smaller percentage of the operations and support costs. Furthermore, to maximize competition and integration of the PTSS into all elements of the BMDS, we are executing an acquisition strategy in which Government Federally Funded Research and Development Centers (FFRDCs) develop non-proprietary preliminary designs and government owned intellectual property, which will be used to enable full and open competition for the production of the satellite constellation while we are validating the performance of prototype satellites on orbit. Recent flight tests using the Space Tracking and Surveillance System (STSS) demonstrator satellites on orbit today have repeatedly shown the significant improvement in our ability to acquire and track ballistic missiles.

In concert with the Phase 3 sensor architecture, the SM-3 Block IIA interceptor is being co-developed with the Japanese government to nearly double the range of our SM-3 interceptors. The SM-3 IIA project is on schedule to be deployed at the Aegis Ashore site in Romania and at an additional Aegis Ashore site in Poland, and at sea, in

2018. The FY 2012 request for SM-3 Block IIA co-development is $424.5M. Additional BMDS improvements during this phase include expanded coordination of missile defense fire control systems and improvements to radar discrimination.

Phase 4: Early Intercept Defense in Europe by 2020. Based on the enhanced early tracking capability of the PTSS and ABIR systems, the SM-3 IIB will provide an early intercept (pre-apogee) capability against MRBMs and IRBMs and provide an additional layer for a more enhanced homeland defense against ICBMs launched from today's regional threats. In FY 2012, we are requesting $123.5M to fund three industry teams to continue concept analysis and development of the SM-3 IIB design while MDA develops relevant advanced propulsion and lightweight material technologies. Advanced discrimination technologies also will be deployed during EPAA Phase 4 including GMD's use of fused data from the entire network of BMDS sensors (including enhancements from PTSS and ABIR sensor capabilities) to improve homeland defense.

Proving Missile Defense Works through Enhanced Testing

In FY 2012, we are requesting nearly $1B of RDT&E funding for Testing and Targets. In collaboration with the Director, Operational Test and Evaluation (DOT&E) and the Operational Test Agencies (OTAs), MDA updated its Integrated Master Test Plan (IMTP). The updated test plan (version 11.1), consisting of 53 flight tests and 74 ground tests from FY 2011 through FY 2016, cost-effectively conducts increasingly complex flight tests to achieve more objectives and enhance the realism of each test.

We will hold a series of system-level operational flight and ground tests to demonstrate the initial capability against SRBMs and MRBMs for theater/regional defense as well as planning in FY 2012 the first entirely operational test of the defense

of the homeland by 2015. Each operational test will be conducted as realistically as possible and involve multiple targets of different ranges. . These tests are being planned and will be executed in concert with the BMDS Operational Test Agencies and under the oversight of the Department of Defense Director for Operational Test & Evaluation. The BMD system under test will be operated by the soldiers, sailors, and airmen assigned to their respective missile defense equipment and placed under realistic wartime conditions to truly document the capabilities and limitations of the system. Finally, in FY 2011, THAAD will execute a near-simultaneous engagement of an MRBM and SRBM.

Developing New Capabilities

After completing all of their original on-orbit testing in 2010, we continue to operate the two STSS demonstration satellites to conduct cooperative tests with other BMDS elements and demonstrate the capability of STSS satellites against targets of opportunity. These tests demonstrate the ability of space sensors to provide high precision, real-time, tracking of missiles and midcourse objects that enable the fire control solutions BMDS interceptors. Two recent flight tests demonstrated that STSS dramatically improved the precision of threat missile tracks and provided more accurate fire control quality data to the Aegis ships several minutes earlier than less accurate data provided by organic radars in the Aegis or THAAD systems. We are requesting $96.4M for the STSS system in FY 2012 and are planning for an Aegis intercept in FY 2013 using the STSS data.. Lessons learned from the two STSS demonstration satellites inform PTSS development decisions. We are requesting $160.8M for PTSS in FY 2012. The PTSS, a new program, will use simple designs and mature technologies

to provide persistent classification and tracking capability of enemy ballistic missiles for areas of the globe that have ballistic missile activity. PTSS project scope includes the delivery of ground segments and the launch of the first two PTSS spacecraft in FY 2017.

In FY 2012, we are requesting $46.9M for the Airborne Infrared (ABIR) program. The ABIR program will provide a capability to track large ballistic missile raids with an airborne forward-based sensor, decreasing the time between the enemy's launch of the first ballistic missile and the first launch of a ballistic missile interceptor. Initially, we will integrate an advanced sensor from the Multi-spectral Targeting System family of infrared sensors onto an MQ-9 Reaper Remotely Piloted Vehicle to prove that we can enable Aegis fire control solutions with forward–based airborne assets. In FY 2012, using platforms and operators supplied by the Air Force, and working closely with the Navy, we propose to continue to demonstrate sensor performance and the ability to provide timely and accurate ballistic missile tracking. Our objective is to integrate the ABIR sensor into a pod that can be attached universally to the wing of a variety of aircraft. Additionally, in FY 2012 we are enhancing our command and control capability to handle larger threat missile raid sizes and leverage airborne and space sensor missile tracking data networks. We will continue our development and testing of a multi-sensor application (ABIR and space sensors) tasking and signal processing capability that will provide data with sufficient quality to enable Aegis, THAAD, and GMD fire control solutions for launching interceptors.

In FY 2012, we are requesting $96.3M for Directed Energy Research ($92.6M for Airborne Laser Test Bed). Following the successful shoot downs of liquid-fueled and

solid-fueled boosting ballistic missile targets with an airborne laser in FY 2010, the Assistant Secretary for Defense Research and Engineering designated the Airborne Laser Test Bed (ALTB) as a science and technology test bed for high power laser research and development. In FY 2012, we are teaming with the Air Force's Research Laboratory to use the ALTB for testing advanced directed energy technologies and conducting beam propagation and lethality testing. A primary objective of our directed energy program is to continue our partnership with Lawrence Livermore National Laboratory to develop Diode Pumped Alkaline-gas Laser System (DPALS) technology, which offers great potential for high efficiency, electrically-driven, compact, and light-weight high energy lasers for a wide variety of missions of interest to MDA and the Department of Defense.

International Cooperation

As stated in the 2010 Ballistic Missile Defense Review (BMDR), developing international missile defense capacity is a key aspect of our strategy to counter ballistic missile proliferation. In Europe, we remain committed to working with our NATO allies to make NATO lower layer missile defense assets interoperable with U.S. upper-tier missile defense assets deployed under the EPAA through NATO's territorial missile defense capability. In East Asia, we are improving missile defenses through bilateral relationships. And in the Middle East, we continue to work with long-term partners and pursue strengthened cooperation with other countries that have expressed interest in missile defense. MDA is currently engaged in missile defense projects, studies and analyses with over twenty countries, including Australia, the Czech Republic, Denmark, France, Germany, Israel, Japan, Kuwait, NATO, Poland, Romania, Saudi Arabia, South

Korea, the United Arab Emirates, and the United Kingdom.

MDA continues its close partnership with Japan on the SM–3 IIA interceptor (Japan is leading the development efforts on the SM-3 IIA second and third stage rocket motors and the nosecone), studying future architectures, and supporting that nation's SM-3 IA flight test program. We also continue collaboration with Israel on the development and employment of several missile defense capabilities that are interoperable with the U.S. BMDS. In February of this year, at a U.S. test range off the coast of California, the Arrow Weapon System successfully intercepted a target representative of potential ballistic missile threats facing Israel today. We are requesting $106.1M for Israeli Cooperative Programs (including Arrow System Improvement and the David's Sling Weapon System) in FY 2012. We are working with our partners from the United Arab Emirates on the development of a Foreign Military Sales (FMS) case for the THAAD system that would represent the first sale of this capability.

Additionally, MDA is actively engaged with the Russian Federation through three missile defense working groups led by the State Department, Office of the Secretary of Defense, and the Joint Staff. We are optimistic from the outcomes of both the NATO Russia Council meeting at Lisbon and the U.S. bilateral working groups that we will make meaningful progress this year in defining how we will cooperate with the Russian Federation on missile defense, including considering leveraging the combined early warning and surveillance radars of both countries.

Conclusion

Our FY 2012 budget funds completing the initial deployment of SRBM, MRBM, IRBM, and ICBM defenses while meeting the War fighters' near-term missile defense development priorities. In parallel, we are developing enabling capability to create an enhanced, international network of integrated BMD capabilities that is flexible, survivable, cost-effective, and tolerant of uncertainties of estimates of both nation-state and extremist ballistic missile threats.

Thank you, Mr. Chairman. I look forward to answering the committee's questions.