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Strategic Forces Subcommittee
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Good afternoon, Madam Chairman, distinguished Members of the Committee. It is an honor to testify before you today on the proposed Fiscal Year (FY) 2010 budget for the Department of Defense's missile defense program.

We are proposing approximately $7.8 billion for missile defense in FY 2010 in response to Secretary Gates's budget guidance and to allow for programmatic flexibility to respond to the Quadrennial Defense Review and the congressionally mandated Ballistic Missile Defense Review. As Secretary Gates announced on April 6, this budget was the result of "a holistic assessment of capabilities, requirements, risks and needs" for the purpose of meeting the Secretary's vision to "institutionalize and enhance our capabilities to enhance the wars we are in today and the scenarios we are most likely to face in the years ahead while at the same time providing a hedge against other risks and contingencies." Specifically, "we will restructure the program to focus on the rogue state and theater missile threat." Due to the previous accomplishments of the Ground-based Midcourse Defense (GMD) program, the technical risk that our current inventory of operationally ready Ground-Based Interceptors (GBIs) is sufficient to destroy the number of rogue nation inter-continental ballistic missile (ICBM) threat missiles that could be launched at any one time today, or over the next decade, is low. However, the technical risk that the inventory of our theater missile defenses can be overwhelmed by the large number of theater class threat missiles and launchers is considerably higher. Furthermore, the previous program's ability to develop future capability to destroy missiles in the highly advantageous early phases of flight will not be operationally available until the later years of the next decade. Thus, to better protect our forces and those of our Allies in theater from ballistic missile attack, we propose to add $700M to field more of our most capable theater missile defense systems, specifically the Terminal High Altitude Area Defense (THAAD) system and Standard Missile (SM)-3 programs. We also propose to add $200M over three years to fund the conversion of 6 additional Aegis ships to provide ballistic missile defense capabilities. Finally, we propose to invest $368 million in FY 2010 for the development and deployment of capabilities to cost-effectively intercept missiles in their ascent phase of flight during the first half of the next decade.

Secretary Gates also emphasized that we were stopping programs with technologies not reasonably available to affordably meet cost or schedule goals. We will not increase the number of current ground-based interceptors beyond the 26 silos in Alaska and four operational silos at Vandenberg Air Force Base. But we will continue to robustly fund continued research and development to improve the capability we already have to defend against long-range rogue missile threats. We will cancel the second Airborne Laser (ABL) prototype aircraft, but we will keep the existing aircraft and shift the program to research and development (R&D) effort to address affordability and technology issues while assessing the program's proposed operational role. We will terminate the Multiple Kill Vehicle (MKV) program because it is not a necessary capability to defeat rogue threats, and its significant technical challenges and long development timeline warrants review of other capabilities to provide a more near-term hedge against future threats. We will also terminate the Kinetic Energy Interceptor (KEI) program since its capability is also inconsistent with the missile defense mission to counter rogue nation threats and for cost growth, schedule delays, and its lack of technology maturity. It is our intention to enhance the cost and operationally effectiveness of our missile defense architectures by increasing our near-term ability to engage missiles in all phases of flight.

The Missile Defense Agency (MDA), Joint Staff, Combatant Commanders, and Armed Services have intensified collaboration on developing missile defense capabilities. As a result, a great deal has been learned about our Ballistic Missile Defense System (BMDS) technology, doctrine, and tactics. As announced by Secretary Gates, and in response to the war fighter's specific needs, we are making the BMDS more affordable and effective by: 1) reshaping our program to enhance protection of our deployed forces, allies and friends against existing threats, 2) maintaining a ground-based midcourse capability to defeat a limited long-range rogue state attack or accidental launch against the United States, and 3) preparing to leverage emerging Ascent Phase Intercept (API) technologies to hedge against threat growth and realize the greatest potential for reducing cost and increasing operational effectiveness of missile defense. This rationale is based in part on a Defense

Science Board 2002 Summer Study, which emphasized the benefits of ascent phase intercepts. The study also noted that the technological and operational challenges of intercepting threat missiles in the ascent phase (the phase after powered flight, but prior to apogee) and significantly less challenging than boost phase intercepts.[1] API would allow us to intercept early in the battle space and optimize our ability to execute a shoot-look-shoot tactic to defeat a threat before countermeasures are deployed, minimize the potential impact of debris, and reduce the number of interceptors required to defeat a raid of threat missiles. Additionally, by destroying missiles early, we do not have to incur the costs of maintaining a significant number of expensive interceptors to destroy advanced countermeasures in a later phase of a threat missile's flight.

With this budget we also will continue to execute to the fullest extent of the law the upper tier European Capability program to counter long-range attacks from Iran, deferring radar and interceptor deployments until policy reviews are complete. We also intend to achieve efficiencies by eliminating redundancy and increasing the centralized management of missile defense acquisition programs.

We will execute a rigorous test program to build the confidence of U.S. and allied stakeholders in the BMDS, bolster deterrence against their use, and send a powerful message to potential adversaries looking to acquire ballistic missiles. Thus, testing figures prominently in our proposed budget for FY 2010.

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[1] Office of the Secretary of Defense, *Defense Science Board 2002 Summer Study on Missile Defense: Phase I and II,* classified SECRET/NOFORN (above extracts are unclassified), December 2002, pp. 42, 49-51.

Furthermore, we are collaborating with the Services' Operational Test Agencies (OTA) with the support of the Director of Operational Test and Evaluation (DOT&E) to restructure our test program to improve confidence in the missile defense capabilities under development and ensure the capabilities transferred to the war fighter are operationally effective, suitable, and survivable.

Finally, the FY08 NDAA required MDA to submit its budget using four appropriations: RDT&E, Procurement, O&M and MILCON. The FY10 component of our recent budget submission includes three of these appropriations, and we satisfy the requirement for the fourth appropriation (O&M) by FY 2012. In developing PB10, we considered several candidates for O&M funding, including the Sea-Based X-band radar (SBX), and reviewed this list with OSD Comptroller. OSD Comptroller determined that all of these candidates were still developmental assets and did not satisfy the criteria for O&M beginning in FY 2010. The Comptroller did agree that THAAD would meet their criteria beginning in FY 2012.

Accomplishments and Challenges

During FY 2008 and FY 2009, the Missile Defense Agency (MDA) achieved many accomplishments, including: the execution of successful Aegis Standard Missile (SM)-3 Block IA and SM-2 Block IV interceptor salvo flight tests and delivery of 28 additional SM-3 Block IA interceptors (including deliveries to Japan); a Ground-based Midcourse Defense (GMD) intercept test utilizing the entire sensor and command and control suite deployed in the Pacific; emplacement of two GBIs and refurbishment of two GBIs at Fort Greely, Alaska; deployment of a AN/TPY-2 radar to Israel; the execution of an experiment involving the closest data collection to date of a boosting missile from a satellite; the safe destruction of a malfunctioning U.S. satellite; repeated demonstration of the atmospheric laser beam compensation during Airborne Laser (ABL) flights; delivery of the first THAAD unit for testing; and three THAAD intercepts, including the launching of a salvo of two THAAD interceptors using operational firing doctrine. Earlier this month, we also successfully placed in orbit the Space Tracking and Surveillance System (STSS) Advanced Technology Risk Reduction satellite to serve as a pathfinder for next-generation space sensor technology.

However, in addition to our successes, we also faced challenges developing the BMDS. During FY 2008 and FY 2009 to date, we experienced 8 significant flight test delays, 4 target failures out of 18 target launches, and one interceptor failure in flight. These and other contributing factors have resulted in $264 million of cost growth. Further, we have incurred over $252 million in unplanned costs and 25 weeks of schedule revisions due to unplanned operational deployments of our systems under development. In response to those challenges, we have worked with our leadership and stakeholders to enhance our management oversight, strengthen our relationship with the war fighter community, and improve BMDS acquisition and test planning. We have adopted a series of initiatives to improve acquisition and oversight of the contracts we will award over the next 18 months. We are also institutionalizing MDA and Service roles and responsibilities for elements of the BMDS that the Deputy Secretary of Defense has designated a lead Service.

Threat

The proliferation of ballistic missiles of all ranges continues. I defer to the Intelligence Community for more detailed estimates, but current trends indicate that proliferation of ballistic missile systems, using advanced liquid- or solid-propellant propulsion technologies, are becoming more mobile, survivable, reliable, accurate and capable of striking targets over longer distances. The proliferation of ballistic missiles is increasing the number of anti-access weapons available to potential regional adversaries. These weapons could be used to reduce military options available to Combatant Commanders and decrease the survivability of regional military assets. Iran has grown its short- and medium-range missile inventories, while improving the lethality, deployability, and effectiveness of existing systems with new propellants, more accurate guidance systems, and sub-munition payloads. With the successful launch of the Safir Space Launch Vehicle on February 2, 2009, Iran demonstrated technologies that are directly applicable to the development of ICBMs. North Korea deploys a No Dong ballistic missile capable of reaching Japan and South Korea and U.S. bases throughout the region, and continues to develop a new intermediate-range ballistic missile (IRBM) capable of reaching Guam and the Aleutian Islands. Despite the failure to place an object in orbit on April 5, 2009, North Korea successfully demonstrated the same staging and separation technologies required to launch a two-stage Taepo-Dong 2 ICBM capable of reaching much of the United States. An additional concern is North Korea's and Iran's repeated demonstrations of salvo launches, indicating large ballistic missile attack raid sizes must be considered in developing the BMDS capability. Syria continues to field updated short-range ballistic missile (SRBM) systems and acquire Scud-related equipment and materials from North Korea and Iran. In sum, there has been an increase of over 1,200 additional ballistic missiles over the past 5 years, bringing the total of ballistic missiles outside the U.S., NATO, Russia and China to over 5,900 (with SRBMs making up 93% of this total and MRBMs making up 6%), with hundreds of launchers and missiles within the range of our deployed forces today (with SRBM launchers making up 91% of this total and MRBM launchers making up 9%).

Missile Defense Approach and Strategy

The mission of the Missile Defense Agency is to develop defenses to protect the U.S. homeland, deployed forces, Allies and friends against ballistic missiles of all ranges and in all phases of flight. The FY 2010 budget submission reflects a greater emphasis to defense of U.S. forces, allies, and friends from regional threats. Given the unique characteristics of short-, medium-, intermediate-, and intercontinental ballistic missiles, no one missile defense interceptor or sensor system can effectively counter all ballistic missile threats. War fighters are not only faced with the challenge of intercepting relatively small objects at great distances and very high velocities, but they may have to counter large raid sizes involving combinations of SRBMs, medium-range ballistic missiles (MRBMs), IRBMs, and ICBMs and, in the future, countermeasures associated with sophisticated ballistic missile attacks.

While countermeasures can be developed to degrade the performance of autonomous missile interceptor systems, it is much more difficult to develop countermeasures that degrade fundamentally different missile defense interceptor systems operating together in different phases of a ballistic missile's flight. Thus, the most operationally effective missile defense architecture is a layering of endo-atmospheric and exo-atmospheric missile interceptor systems with ground and space sensors connected and managed by a robust Command and Control, Battle Management and Communication (C2BMC) infrastructure. Moreover, the most cost-effective missile defense architecture is one that emphasizes early intercepts during a threat missile's ascent phase of flight before countermeasures can be deployed and before the remainder of the BMDS architecture is required to track and kill a threat reentry vehicle and associated objects.

Missile Defense Interceptor Development

The SRBM defense capabilities of the BMDS consist of the Patriot Advanced Capability-3 (PAC-3), THAAD, and the Aegis SM-2 Block IV and a portion of the SM-3 Block IA missile battle space with associated fire control software. PAC-3 uses hit-to-kill technologies to intercept SRBMs in the atmosphere in the terminal phase of flight. MDA transitioned PAC-3 to the U.S. Army in March 2003, and although we continue to exercise configuration management, provide sustaining engineering, and retain architectural responsibility, MDA does not manage the upgrades to PAC-3 such as the Missile System Enhancement (MSE).

Terminal High Altitude Area Defense (THAAD). THAAD is a near-term transportable capability that will enhance the ability of Combatant Commanders to wage theater wars by intercepting SRBM and MRBM threats using hit-to-kill technologies. THAAD consists of interceptors, command and control, and a THAAD-configured AN/TPY-2 radar software. The THAAD missile is uniquely designed to intercept targets both inside and outside the Earth's atmosphere, making the use of countermeasures against THAAD in their terminal phase difficult. For FY 2010, we are requesting $420 million for THAAD procurement. The full funding policy using procurement funds has been applied to the THAAD procurements beginning in FY 2010. We also are requesting $665 million of Research, Development, Test & Evaluation (RDT&E) funding for THAAD. We will deliver 24 THAAD interceptors in FY 2010 for batteries 1 and 2 using RDT&E funds and, in response to war fighter requests to bolster defenses against rogue state threats to our forces and allies, increase the production rate from three to four interceptors per month using procurement funds. We also propose to invest in communication hardware and software to enhance THAAD integration into the BMDS, enhance testing and modeling and simulation, and conduct risk reduction development for increasing the range of THAAD interceptors.

THAAD's test record is 6 intercepts out of 6 attempts against SRBMs. Early in FY 2008, soldiers of the U.S. Army's 6th Air Defense Brigade conducted THAAD's demonstration of autonomously intercepting a short-range "Scud-type" unitary target just outside the atmosphere. In June 2008 THAAD intercepted a separating SRBM target. On March 18, 2009, we launched a salvo of two THAAD interceptors based on a cue from an Aegis BMD ship to intercept a separating target high in the earth's atmosphere. Not only did the primary interceptor hit the target, but the second THAAD interceptor also hit the largest remaining piece of target debris seconds later.

In FY 2008, THAAD participated in six war games and exercises with Combatant Commanders to train soldiers and help develop tactics, techniques and procedures. THAAD's involvement with C2BMC, PAC-3 and Aegis in MDA ground tests for theater and strategic missile defense engagements provided data to support BMDS capability assessments.

Through Foreign Military Sales, the United Arab Emirates Government requested 3 THAAD batteries and one additional radar to maximize availability. This will represent a potential $6.9 billion FMS sale for the U.S. Government, which would greatly enhance deterrence in the region. Additionally, other Gulf Cooperation Council countries have requested performance and cost data for THAAD.

Despite THAAD's significant successes, the program continues to address production qualification issues of several remaining missile components, including a critical ordnance initiation safety device. Successful qualification of this component by the end of FY 2009 is necessary to gain Army approval for fielding in FY 2010.

Aegis BMD. Aegis Ballistic Missile Defense (BMD) cruisers and destroyers integrated with SM-3 hit-to-kill interceptors and SM-2 terminal interceptors provides a unique mobile capability that may be surged to a region to protect deployed forces and allies against SRBMs and MRBMs. In FY 2010, we are requesting $169 million for Aegis BMD procurement. We will deliver 26 SM-3 Block IAs in FY 2010. Like THAAD, additional funding ($60 million) is included for Aegis BMD to move towards meeting the full funding policy for the procurement of each lot of missiles. We are also requesting $1.691 billion for FY 2010 for RDT&E to develop enhanced theater-defense capabilities, hardware and software development and ship upgrades, fielding of the initial Aegis BMD regional/theater defensive capabilities, Aegis BMD sustainment, near-term sea-based terminal development and initial development of a land-based SM-3 interceptor.

In FY 2008, Aegis BMD began significant upgrades to the BMD Signal Processor in the Aegis BMD weapon system and delivered 20 SM-3 Block IA interceptors (not including nine SM-3s delivered to Japan). We also updated software (BMD 3.6) on eight U.S. destroyers, bringing the total number of U.S.

Aegis BMD-capable ships ready on station at the end of 2008 to 18, a year ahead of the original schedule. MDA also installed engagement software (3.6) on the Japanese Destroyer Kongo and began installation of the more advanced fire control software (4.0.1) in the U.S.S. Lake Erie. Aegis weapons system software build 4.0.1 will allow Aegis to launch SM-3 missiles sooner than the organic Aegis Spy-1 radar allows by leveraging external BMDS sensors. We plan to continue software development for potential installation on all Aegis BMD ships during the next decade to enable the deployment of the more capable SM-3 Block IB interceptor and, eventually, the long-range SM-3 Block IIA interceptor currently being developed with our Japanese partners.

Early in FY 2008, we demonstrated Aegis ability to simultaneously engage two short-range unitary ballistic missile targets using SM-3 Block IA interceptors. In FY 2008, we also completed an end-to-end Multiple Element Integration & Test for the 3.6.1 software and deployed the first Aegis BMD ship (U.S.S. Ramage) on the East Coast. In December 2007, we conducted the first intercept of a ballistic missile with an allied navy ship. Using the SM-3 Block IA, the upgraded Japanese Destroyer successfully intercepted the medium-range separating target in space. This test also marked a major milestone in the growing missile defense cooperative relationship between Japan and the United States. In a subsequent test in November 2008, the Japanese Maritime Self Defense Force performed another successful interceptor launch and fly-out, but a few seconds prior to intercept, the kill vehicle's guidance control motor failed resulting in a test failure. The failure investigation of the SM-3 Block IA continues with a confirmatory flight test this summer.

The U.S. Navy and MDA are also collaborating on plans for a near-term sea-based terminal defensive capability to enhance the Combatant Commander's ability to protect seaborne forces and complement other regionally deployed missile defense assets. MDA is upgrading the Aegis BMD weapon system, and the Navy is upgrading the SM-2 Block IV missile with plans to eventually deploy approximately 70 interceptors to provide a near-term terminal engagement capability on Aegis BMD ships that began in 2008. Additionally, in June 2008 we intercepted a short-range target in the terminal phase of flight using a dual salvo SM-2 Block IV with modified Aegis ship software. Unlike the SM-3 interceptors, which use hit-to-kill technologies to collide with a target, the SM-2 missiles for the near-term sea-based terminal defense capability use an explosive charge in very close proximity to the target to destroy the threat missile. We continue to develop with the Navy an advanced sea-based terminal defense solution for more effectively countering short-range ballistic missiles.

The SM-3 Block IB missile with Aegis 4.0.1 BMD fire control software is being developed to counter SRBMs, MRBMs, and IRBMs. The SM-3 Block IB will have greater reliability, producibility and performance against more advanced threats and clutter during end-game. The first controlled test flight of the SM-3 IB is scheduled for FY 2010.

We are continuing our work with Japan to substantially increase Standard Missile-3 range and lethality by developing a 21-inch diameter SM–3 Block IIA interceptor. We are working to add this capability to the BMDS in the next decade after we complete the necessary testing with Japan as a hedge against the possibility we may see a proliferation in longer range threats over the next decade. This effort is one of the largest and most complex cooperative projects ever undertaken between Japan and the United States.

Ground-based Midcourse Defense. We are requesting $983 million in RDT&E for GMD to provide protection of the United States against the limited number of rogue state and accidental launches of IRBMs and ICBMs. In FY 2010, we will maintain this long-range defense capability with missile fields at Fort Greely, AK, and Vandenberg Air Force Base (VAFB), CA, where we will emplace 26 and 4 Ground-Based Interceptors (GBIs), respectively. We will also continue to buy eight additional GBIs for testing, two for test spares and four for operational spares. Thirty operational GBIs will provide the United States with a substantial inventory of operational interceptors considering the limited number of ICBM launch complexes in North Korea and Iran and the long development time required for additional launch complexes. However, we will robustly fund continued research and development to capitalize on the inherent capacity to improve the capability we already have to defend against long-range rogue missile threats. We will continue rigorous ground testing and conduct at least one intercept flight test using a three-stage GBI in FY 2010 and continue the development and testing of two-stage GBIs to expand the defensive battlespace to protect the United States. We also increased funding for GMD models and simulations, upgrades to increase the robustness and reliability of GMD communications, upgrades to the command and launch systems, and for security, infrastructure and sustainment for operations at Ft. Greely and VAFB. The FY 2010 budget conveys a commitment to procure the complete buy of 44 GBIs on contract, of which some will go to the replacement and refurbishment of the 14 oldest interceptors to improve the operational readiness of the fleet and extend the U.S. production capacity to 2013, which will allow us to meet our commitment to the European Capability, respond to test results, and implement future policy or fleet lifecycle management decisions. The GBIs and GMD silo system were designed to minimize the need to test complete missiles in flight testing. Decisions considering all the above will determine in combination with a maintenance and refurbishment program the ultimate size of the GBI fleet prior to final production deliveries in 2013.

Due to problems associated with a non-tactical telemetry data encryption electronic card encountered in February 2008, we did not conduct GMD flight test 5 (FTG-05) until early FY 2009. During that flight test, the GMD system intercepted an IRBM warhead within an operational architecture of sensors deployed in the Pacific region. We also intended to test the GMD exo-atmospheric kill vehicle (EKV) against simple countermeasures, but the inter-stage panels on the target failed to eject when commanded, and the countermeasures did not deploy. This was our last test using this particular target configuration, and we have added simple countermeasures to the next GBI test. During FTG-05 we also verified that Aegis BMD performed as expected and conducted a simulated engagement of this IRBM target.

We recently completed the construction of a second GMD missile field at Fort Greely and a new multi-function test and operational silo and an additional In-Flight Interceptor Communication System Data Terminal (IDT) at VAFB. Additionally, we are upgrading the security infrastructure and completing the construction of a new power plant and power distribution system at Fort Greely. In FY 2008, we refurbished two existing GBIs, delivered two upgraded EKVs and emplaced two new interceptors early in FY 2009. One of our emplaced GBIs was removed in mid-year 2008 in order to provide a backup flight test interceptor for future flight tests. Unfortunately, we also experienced issues with unexpected health and status indicators of several GBIs in their silos that warranted removal to perform unscheduled maintenance and missile refurbishment. Two of our emplaced GBIs have upgraded EKVs to address obsolescence issues, but will not be declared operational until their EKV configuration flies later this year. Once operational GBIs are emplaced in all 30 silos, we will begin replacing the oldest emplaced GBIs with the newest interceptors from the 44 total produced to maintain a high state of operational readiness in their latest configuration.

Missile Defense Sensor and C2BMC Development

Continuously available, transportable, and mobile BMDS sensors provide real-time detection and tracking data to the system and the war fighter through command, control, battle management and communications (C2BMC). We are requesting $637 million for sensors in FY 2010. Major programmatic content in our request includes $45 million for contractor logistics support and another $73 million for additional operations support for the AN/TPY-2 X-band radars deployed in Japan and Israel. We are also requesting $340 million for C2BMC in FY 2010. Most of the request is allocated to the continued upgrading of C2BMC hardware and software to employ the sensor management and communication for our initial defense capabilities and develop the C2BMC planning and architecture to make API a near-term capability.

The BMDS relies on space-based (Defense Support Program, space-based infrared satellites and, in the future, an operational Space Tracking and Surveillance System (STSS) constellation), sea-based mobile (Aegis BMD ships and Sea-Based X-band), and ground-based (Cobra Dane, Upgraded Early Warning Radar (UEWR), AN/TPY-2 and European Midcourse Radars) sensors to provide detection, tracking, classification and hit assessment information. The United States Air Force currently operates the UEWR at Beale Air Force Base, California and the Cobra Dane radar at Shemya, Alaska. The Royal Air Force operates the UEWR at Fylingdales Moor in the United Kingdom and, this year, we plan to complete system upgrades to the UEWR at Thule, Greenland using funds appropriated for FY 2009.

In July 2008 we conducted a major integrated sensor and C2BMC test (FTX-03) involving the simultaneous observation of an IRBM launched from Kodiak, Alaska using five operational BMDS sensors— the Air Force early warning satellite system, the forward-based X-band AN/TPY-2 radar near Juneau, Alaska, the UEWR at Beale, Aegis SPY-1 radar (USS Benfold), and the Sea-Based X-band radar (SBX) radar in the Pacific Ocean. We were able to conduct simultaneous processing of data from multiple sources, correlate this data into a single threat track, and develop an engagement solution for GBI to achieve the simulated intercept. War fighters conducted the associated radar, fire control, and simulated launcher operations.   This same sensor and C2BMC architecture supported the intercept of an IRBM target by a GBI in FTG-05.

MDA is developing a C2BMC system that integrates the BMDS elements into a layered defense system. Key to C2BMC integration of the GMD, THAAD, Aegis and Sensor elements into an effective BMDS is the centralized development of 7 common missile defense functions called the BMDS “Unifying Missile Defense Functions” (UMDF). The following UMDF will allow Combatant Commanders to automatically and manually optimize sensor coverage and interceptor inventory to defend against all ranges of ballistic missile threats.

Communications (terrestrial and satellite) connects and supports the Unified Missile Defense Functions and ensures that the Combatant Commander can effectively execute his defensive mission. MDA will continue to maintain interface controls with C2BMC, but we will complete transition of management of the terrestrial long-distance communications to the Defense Information Systems Agency (DISA) and the satellite communications ground stations to the Services in 2011.

Sensor Registration improves the overall accuracy of the network of sensors to support the C2BMC formation of the system track by ensuring the BMDS understands the relative position of every sensor in the network. Thus, sensor registration enables the integration of different sensor measurements in ballistic missile engagements.

Correlation and System Track functions create a single track of an object using multiple BMD sensors. Since many ballistic missile threats fly over great distances, the BMD system relies on the correlation of multiple (land, sea, and space) sensors to form a common track picture and complete the target information handover to the weapon system kill vehicle. In 2007 and 2008 we developed requirements, assessed performance, executed hardware-in-the-loop demonstrations, and conducted live test events with Aegis simulated intercepts where system tracks were passed from the AN/TPY-2 through the C2BMC, and C2BMC provided Link 16 tracks to Aegis BMD ships. These demonstrations provided valuable data supporting the fielding of the AN/TPY-2 with C2BMC in Israel and data integration with the Arrow Weapon System for operational use in 2008.

System Discrimination is the BMDS function that determines whether objects resulting from a threat missile launch are lethal or non-lethal using inputs from multiple sensors. Different sensors, depending on location and capability, provide different features about objects associated with a ballistic missile attack. The resulting discrimination information is more accurate than input from any one sensor over a threat missile's trajectory.

Battle Management uses system tracks composed of correlated and discrimination data to identify sensor and weapon system taskings that enable the Combatant Commander to most efficiently implement weapon engagement plans. Fundamentally, engagement coordination combines all elements of UMDF to prioritize and assign threat tracks to specific interceptor systems to implement operational objectives such as minimizing interceptor use, focusing on protecting a prioritized list of defended assets, or ensuring the highest probability of success. In 2008, C2BMC demonstrated aspects of engagement coordination by controlling AN/TPY-2 in support of the Arrow Weapon System. In FTG-05, the External Sensors Lab (ESL) generated a boost phase state vector, sent it to C2BMC; C2BMC then generated a precision cue message from the ESL data and sent the cue to the AN/TPY-2. The cue was recorded at the radar for post mission analysis. In 2008, THAAD and Patriot demonstrated peer-to-peer engagement coordination in an integrated ground test (GTI-03) by providing in real time the engagement status of each weapon system's ability to engage missiles in accordance with the rules of engagement.

Hit and Kill Assessment uses all available sensor observations of the intercept to confirm a successful hit-to-kill engagement, assess payload type, or identify surviving objects rapidly enough to enable additional intercept attempts by the BMDS if possible.

Missile Defense Technology Development

A robust advanced missile defense technology development program is part of our strategy to hedge against future threat uncertainties. MDA is intensifying its focus on enabling the capability to intercept a threat missile early in its flight, prior to its apogee. A missile defense architecture that emphasizes an early intercept capability places a premium on persistent surveillance of threat missile launches in specific regions of interest. Likewise, the emerging architecture will emphasize the forward positioning of mobile and transportable flexible missile defense assets, which would include sensors for early detection, a highly responsive and reliable C2BMC infrastructure, and energetic and agile weapons.

For FY 2010, we are requesting $180 million for the Space Tracking and Surveillance System (STSS) to demonstrate the technology to track threat objects from space by using two STSS demonstration satellites to be launched this summer. Sensors on STSS satellites could provide fire control quality tracking data for engagements of threat reentry vehicles and, when combined with radar data, will provide improved threat object discrimination. Following launch of the STSS, we will enter into a six-month on-orbit check-out period, after which we plan to use both targets of opportunity and dedicated targets to demonstrate STSS capabilities. Knowledge point-based lessons learned from these demonstrations will guide our decisions on the development of an affordable, continuously available operational precision track space sensor constellation.

The Near Field Infrared Experiment (NFIRE) satellite launched in April 2007 continues to operate in good health. We conducted NFIRE test mission 2B in September 2008 to collect first-of-a-kind high resolution plume and hard body data of a boosting missile at approximately 8 km range from a boosting missile. In this test, we collected multiple frames of data in multiple wavebands, which will help anchor plume to hard body handover algorithms for boost phase intercept applications. We continue to collect data on other targets of opportunity. We also demonstrated very high capacity laser communications on board the NFIRE satellites.

Our boost phase intercept technologies include the Airborne Laser (ABL) and Net Centric Airborne Defense Element (NCADE) technology programs. We are requesting $187 million for FY 2010 to further develop these technologies. In FY 2008 we verified ABL can acquire, track, and perform atmospheric compensation in flight against a non-cooperative target and completed installation of the high power laser on the aircraft. We achieved first light through the Beam Control/Fire Control and successfully fired the complete high energy laser weapon system from the aircraft on the ground in November 2008. While we will cancel the planning for Tail #2 aircraft, we will maintain Tail #1 and continue ABL research and development to address many of the program's affordability, technical, and operational challenges. We are focusing the ABL program on achieving repeated shoot-downs of missiles in their boost phase in FY 2010. We are requesting funding for two lethal shoot-downs in the first half of FY 2010, retaining critical skills needed for optics and fire control, and continuing test flights. We are also prepared to de-commission the Tail #1 aircraft if the shoot-downs are unsuccessful. We addressed an optics contamination issue which delayed the return to flight, but we currently flying a fully integrated ABL today and are on track for a shoot-down of a ballistic missile later in 2009.

In 2008 we also demonstrated the NCADE, a promising air-launch missile defense concept that uses a modified AIM-9X seeker to intercept a boosting missile target. Plume-to-hard body aim point transition was completed, and sensors on-board an F-15 aircraft successfully detected, acquired, and tracked three stages of a boosting missile target. We are requesting $3.5 million for FY 2010 for continued work on NCADE technologies and to study the concept further.

<u>Terminated Program Activities</u>

We are terminating two technology programs, the Multiple Kill Vehicle (MKV) program and the Kinetic Energy Interceptor (KEI) program, which do not match our strategy of focusing on near-term, rogue state, and theater missile threats. We are reviewing both programs to assess their contribution to follow-on

Ascent Phase Intercept and other R&D efforts to contribute to our "hedge" against future threats. The MKV technology program was established for integration onto midcourse interceptors to address complex countermeasures by identifying and destroying all lethal objects in a cluster using a single interceptor. Instead, we are now assessing the feasibility of destroying threat missiles early in flight before countermeasures can be deployed as a hedge against advanced future threats. The KEI mission was to counter advanced missile defense threats and is inconsistent with the Secretary of Defense's FY10 budget guidance to focus missile defense development on rogue and theater missile threats. The original KEI mission grew from a boost phase only mission to a boost and mid-course mission. The development schedule grew from 5 1/2 years to 12 to 14 years (depending on spirals), program cost grew from $4.6B to $8.9B, and the missile average unit production cost grew from $25M to over $50M per interceptor. Technical issues delayed the first booster flight test date (established in 2007) by over a year and we assess the probability of this flight test occurring this year as very unlikely. Affordability and government requirements growth, not contractor performance, was the main contributor to KEI's execution problems. Given the above and that 15% of the $8.9B worth of work on contract till 2018 has been accomplished, the KEI program was terminated. However, the contractor has indicated they can complete their flight test by the end of September 2009 in a manner that accommodates our legal liabilities for program termination, and we will assess their proposal. If their proposal is valid, we will modify the stop work to allow the flight test in September.

BMDS Contingency Deployments

Due to the limited integrated missile defense capability fielded today, developmental elements of the BMDS have been deployed on a contingency basis at the request of Combatant Commanders and the Joint Staff. USSTRATCOM provides the requesting Combatant Commander an assessment of the capabilities and limitations of the requested capabilities based on test information collected at the time of the Combatant Commander's request. Contingency deployments directed by the Joint Staff usually require MDA to alter affected development programs' budget execution plans and schedules. An example is the unplanned deployment of the AN/TPY-2 X-band radar to Israel in August 2008 to bolster Israel's regional ballistic missile defense capabilities at a cost of over $80 million. Additionally, we spent analytical and test resources supporting the Department's plans to provide options for dealing with any contingency associated with the recent launch of a Space Launch Vehicle from North Korea.

The February 2008 satellite-shoot down is another example of how the Department has leveraged MDA's expertise and products to respond to contingencies. We demonstrated the system's flexibility and MDA's technical skills in supporting the real-world contingency operation by rapidly modifying BMDS components to provide a unique capability to the Navy to shoot down a specific

U.S. satellite in a decaying orbit containing toxic fuel. The SM-3 missiles, radars, and system software had to be quickly modified to enable the intercept, which also required integration of off-board tracking data from our sensor network. Using the modified SM-3 and Aegis Weapon System, the Navy successfully destroyed the satellite some 250 kilometers above the earth's surface by hitting the dangerous hydrazine fuel tank within centimeters of a specific aimpoint to ensure we destroyed the fuel tank. After this mission, we removed these temporary modifications, returning Aegis Weapon System to its operational configuration. While successful, the time and level of technical expertise it took to plan and orchestrate this mission, the split-second fragility of the once-per-day shot opportunities, and the relatively low altitude of the satellite's decaying orbit make clear the BMDS to not be an operational anti-satellite capability. The impact to the Aegis BMD program was a 3-month delay at a cost of $112 million to MDA. While the funding was subsequently reimbursed to MDA, the schedule delays were not recoverable.

U.S.-Israeli Cooperative Programs

We are requesting $120 million in FY 2010 for U.S.-Israeli cooperative missile defense efforts. The United States and Israel have cooperated on missile defense for over twenty years. Collaboration has grown from early feasibility studies to the development and employment of the Arrow Weapon System, a fully-operational missile defense architecture that is interoperable with U.S. BMDS elements. New joint programs have advanced this cooperation: U.S. and

Israeli industrial co-production of Arrow interceptors; the joint Short Range Ballistic Missile Defense Program's David's Sling Weapon System; and an initiative to provide Israel an upper-tier defense system.

The upcoming year will include several significant events that will demonstrate combined U.S. and Israeli missile defense capabilities. Israel conducted the first intercept test of the enhanced and co-produced Arrow-2 in April 2009, successfully acquiring, tracking, and intercepting a separating target. AN/TPY-2 and C2BMC sent cueing data on the target to the Arrow Weapon System. The Juniper Cobra exercise between European Command (EUCOM) and the Israeli Defense Forces to be held later in 2009 will be the fifth and most complex exercise yet designed. U.S. BMDS elements such as the AN/TPY-2, THAAD and Aegis BMD will participate in these exercises to demonstrate the interoperability and develop operational tactics, techniques and procedures associated with this coalition architecture.

MDA and Israel are also jointly developing the David's Sling Weapon System to defend against shorter range threats, to include some ranges that the PAC-3 system cannot engage. The first booster fly-out was successfully conducted in February 2009, with additional interceptor fly-outs scheduled later this year. The first intercept test is scheduled to occur in 2010. Additionally, MDA is coordinating with the U.S. Services to identify opportunities for U.S. utilization of the David's Sling Stunner interceptor.

Finally, the United States and Israel have initiated development of an upper-tier component to the Israeli Missile Defense architecture. An Analysis of Alternatives of a land-based SM-3 and a new Arrow 3 missile indicated that the Arrow 3 alternative may have a reduced 30 year life cycle cost and potentially better performance to meet Israel's requirements, but was also deemed to have very high schedule and technical risk to meet the Israeli proposed need date. We have proposed FY 2010 funding for the Israeli upper tier project that is consistent with historically authorized and appropriated funding levels and are coordinating an agreement that contains knowledge points to measure progress and joint U.S.-Israeli management responsibility. To mitigate the Arrow 3 development schedule risk, we are ensuring that the development of a land-based variant of the proven Aegis SM-3 missile is available to meet Israel's upper tier requirements.

European IRBM and ICBM Defense Capability

We remain committed to working with our NATO partners to address the growing threat from ballistic missiles. In the summit declaration issued on April 4, 2009, all NATO Heads of State and Government reaffirmed the conclusions of the Bucharest Summit, that "(b)allistic missile proliferation poses an increasing threat to Allies' forces, territory, and populations. Missile defence forms part of a broader response to counter this threat." As part of this response, NATO agreed that "a future United States' contribution of important architectural elements could enhance NATO elaboration of this Alliance effort." The Department has previously proposed to field sensors, interceptors, communications, and the C2BMC infrastructure needed to improve protection of the United States and, for the first time, with the United Kingdom and Denmark, extend upper-tier, ICBM and IRBM, defense coverage to all European NATO allies vulnerable to long-range ballistic missile attack from the Middle East. The NATO Active Layer Theater Missile Defense (ALTBMD) program will develop the lower-tier, MRBM and SRBM, defense necessary for complete defense of NATO against all missiles of all ranges launched from the Middle East. The previously proposed upper-tier European Capability focuses on relocation of the upgraded midcourse X-band radar, currently located at the Kwajalein test site, to the Czech Republic and the establishment of a midcourse interceptor field in Poland, pending ratification of signed missile defense agreements with both governments. We have signed a BMD Agreement and a supplemental Status of Forces Agreement with the Czech Republic. We have signed a BMD Agreement with Poland and continue to negotiate a supplemental Status of Forces Agreement. Whether Poland or the Czech Republic will ratify these agreements remains unclear. In the meantime, we will continue to work closely with both nations and NATO, and we will continue to assess potential missile defense architectures for optimum effectiveness. To accommodate the discussions and the architecture assessment we have deferred the fielding of 10 GBIs at European Interceptor Site in Poland and the European Midcourse Radar in the Czech Republic to beyond FY 2010. We will continue planning and design activities as allowed under the FY 2009 National Defense Authorization Act to preserve our opportunity to move forward with the start of Military Construction and site activation activities at both European Capability sites.

International Cooperative BMD Activities

The global proliferation of MRBMs and IRBMs warrants an international coalition approach to deter further acquisition of these offensive missiles and employ an operationally effective missile defense significantly contributes to that deterrence. Therefore, under the guidance of Office of the Secretary of Defense, MDA works closely with Combatant Commanders, the U.S. Department of State, and other government agencies to support their missions and goals. As a result, MDA has significant cooperative missile defense technology development efforts, including six "framework" agreements, signed by the Secretary of Defense, to facilitate BMD cooperative research with Japan, the United Kingdom, Australia, Denmark, Italy, and, most recently, the Czech Republic. Cooperative activities are under consideration with several other nations.

With the purchase of Aegis BMD and PAC-3 assets, Japan is fielding a multilayered system that is capable of being interoperable with the U.S. system. Japan's C2BMC (JADGE) system will integrate Japanese BMD sensors and interceptors and will be capable of exchanging information with U.S. missile defenses, including the forward-based X-band radar at Shariki and U.S. Aegis BMD ships in the region. The X-band radar at Shariki provides precise early detection and tracking to increase the probability we will destroy any lethal target launched by North Korea.

MDA's C2BMC will continue leading the integration of the BMDS with NATO command and control. In November 2008 and January 2009, we completed initial tests confirming integration between the NATO Active Layered Theater BMD program office and our C2BMC.

MDA continues to support Administration efforts to propose transparency and confidence-building measures, technology development programs, and missile defense architectures to collaborate with the Russian government. Additionally, we have invited Russian representatives to view our test flights, which they have attended in the past, and participate in our annual Multinational Missile Defense Conference. I visited the Russian radar at Gabala, Azerbaijan, and personally assessed its valued contribution to U.S. and NATO missile defense efforts. Furthermore, we have been able to identify several potential areas of cooperative technology development such as sensor netting, propulsion, and high energy lasers, collaborative testing, and information-sharing initiatives such as the Joint Data Exchange Center. These areas of cooperation are under review by the Department of Defense.

Enhancing Oversight of MDA and Collaboration with the Services and War Fighters

As our missile defense development processes have matured, the Department has taken several significant steps to enhance accountability for MDA decision making and oversight by senior Department of Defense officials in collaboration with Combatant Commands and the Services. First, the Deputy Secretary of Defense established the Missile Defense Executive Board (MDEB), chaired by the Under Secretary of Defense for Acquisition, Technology and Logistics (AT&L) and comprised of the following members: Assistant Secretary of State for International Security and Nonproliferation; Under Secretary of Defense for Policy; Under Secretary of Defense for Intelligence; Vice Chairman, Joint Chiefs of Staff; Commander, U.S. Strategic Command; Director of Operational Test & Evaluation (DOT&E); Director of Defense Research & Engineering; Vice Chief of Naval Operations; Assistant Secretary of the Army for Acquisition, Logistics and Technology; Deputy Under Secretary of the Air Force for Space Programs; Director of Program Analysis & Evaluation; and Director, Missile Defense Agency. The MDEB meets bi-monthly to review program progress, inform missile defense budget decisions, conduct missile defense development portfolio trades, and provide guidance to MDA.

In September 2008, the Deputy Secretary of Defense established "business rules" that outline the transition and transfer of missile defense capabilities between the Missile Defense Agency and the Services. These rules designate that "transition" of an element of the BMDS begins when the Deputy Secretary of Defense designates a "lead Service" to ultimately receive that capability through formal transfer. MDA is responsible for the development, manufacturing and testing for the lifecycle of BMDS elements, and the Services are responsible for developing the doctrine, organizations, training, logistics, personnel and facilities to effectively field and operate the element sub-systems of the BMDS. Once the MDEB concurs that transfer criteria, approved by the Deputy Secretary of Defense, have been met, the physical accountability and control of missile defense units, operations and support, and infrastructure responsibilities transfer to the lead Service. Research, development, manufacturing, and testing activities remain the responsibility of MDA after a BMDS element capability has been transferred to a lead Service. Accordingly, "hybrid" program offices, consisting of organizations reporting to either MDA or the lead Services will be formed to execute this division of responsibilities once a lead Service has been designated for a BMDS element.

In support of the MDEB as the COCOM advocate for missile defense, USSTRATCOM, in collaboration with the other Combatant Commands, Joint Staff, and the Services, assesses and prioritizes the development of future missile defense capabilities. As previously stated, USSTRATCOM also performs Military Utility Assessments (MUAs) to determine the capabilities and limitations of our systems under development when they are considered for contingency deployments by the Combatant Commanders.

Meeting the challenges of countering the proliferation of ballistic missiles requires the participation of assets in all our Services, thus developing and deploying the BMDS are inherently joint endeavors. The Deputy Secretary of Defense's transition and transfer business rules define the roles and responsibilities of developing and fielding missile defense capabilities. Accordingly, the Services and MDA have begun developing Memorandums of Agreements (MOAs) to define the management and interrelationship of MDA's research, development, testing and manufacturing responsibilities and align them with the Services' Title 10 Operations and Support responsibilities. The Secretary of the Army and I signed an "overarching" Army/MDA Transition and Transfer MOA on January 21, 2009, and drafts of the Navy and Air Force MOAs are being coordinated by their respective staffs. A key aspect of the MDA/Service MOAs is the establishment of MDA/Service Boards of Directors to collaboratively review cooperative development, resolve issues associated with the development and fielding of the Service designated BMDS elements, and raise unresolved issues to the MDEB.

Improving Acquisition of the BMDS

As the development of missile defenses matures, the Department is reviewing MDA's exemptions and waivers from standard acquisition practices to align MDA's management processes with the Services receiving this capability. As I continue as the Acquisition Executive for the initial phases of missile defense concept through initial production and test, I am proposing milestone review and baseline reporting processes that are closely aligned with DoDI 5000.

Enhancing System Engineering. The key to the effective and efficient management of the acquisition of a large, technically complex enterprise, such as the missile defense program, is the establishment of management baselines resulting from a disciplined systems engineering process. MDA manages its programs via resource, schedule, operational, technical, contract and test baselines. To strengthen the systems engineering process to create, manage and implement those baselines, MDA designated a senior executive position (designated the "Director for Engineering") to establish engineering policy, ensure the disciplined practice of systems engineering fundamentals, and develop the systems engineering competencies of the missile defense workforce. The Director for Engineering oversees the career development of an engineering cadre that focuses on leveraging national expertise to assist MDA program managers in the cost, schedule, performance, and risk trades inherent in the development of executable baselines. Additionally, we created engineering "Knowledge Centers" (for Interceptor, C2BMC, Sensor, and Space application disciplines), staffed by highly qualified senior engineers from Federally Funded Research and Development Centers (FFRDCs), academia, Government Laboratories, and industry, to mentor and foster the practical application of missile defense engineering competencies and technical problem-solving skills across the MDA workforce. Finally, to ensure the future health of MDA's engineering workforce, we have dramatically increased the number of recent engineering school graduates inducted into our two-year Career Development Program from 6 to 60 students per semester in order to sustain a population of over 200 entry level government engineers being mentored as they enter the MDA workforce.

Technology Maturity Assessments. To ensure the risk of technology insertion is well understood prior to advanced system development, we set specific knowledge points when sufficient data or knowledge is obtained from discrete events (typically the completion of a major test campaign) to make decisions on the readiness of development efforts to continue on their current plans. This approach enables us to assign Technology Readiness Levels (TRLs) that support programmatic decisions based upon the proven maturity of a technology under consideration.

Developmental Testing. While the benefit of early operational input to the development of missile defense systems is clear, premature entry into operational development and testing (i.e., before the design and configuration has been stabilized and basic technical concepts have been validated) risks expensive repetition of non-recurring engineering and operational development. To mitigate this risk, MDA is transitioning from “architecture-based” test objectives to “technical parameter-based” objectives identified early in a program to anchor models and simulations (M&S). These M&S will estimate performance characteristics and cost-effectively demonstrate the impact of technical risk mitigation prior to committing to full acquisition development of a capability.

Independent Cost Assessments. MDA and the Services are establishing agreements to collaboratively develop high fidelity cost estimates, and we have invited the OSD Cost Analysis Improvement Group (CAIG) to independently assess the assumptions, product description, cost estimating relationships, and methodologies as cost estimates are developed. These cost estimates will be the basis of system engineering trades and programmatic decisions at all levels.

Working with Combatant Commanders. In accordance with the 2008 Unified Command Plan, USSTRATCOM systematically assesses and establishes the priorities for developing and fielding BMDS capabilities. This biannual Warfighter Involvement Process (WIP) involves all Combatant Commands and the Services and produces a Prioritized Capability List (PCL) of desired missile defense capabilities. Although this product is developed once every two years, the MDEB and the Joint Staff (J-8) review BMDS development priorities and progress on a frequent basis. Working with OSD, government laboratories, and industry, MDA responds to the PCL with an assessment (called the Achievable Capabilities List) of the technical and schedule risks and programmatic feasibility of delivering the requested capabilities in the timeframe specified. USSTRATCOM, as a member of MDA's program control board that manages the configuration of MDA's programmatic and operational baselines, then rates the degree to which the ACL satisfies the PCL in the Capability Assessment Report (CAR). The CAR forms the rationale and justification for MDA's annual budget submission.

USSTRATCOM used MDA's 2008 ACL and other studies, war games and exercises to develop the CAR delivered in April 2009, which covers the timeframes through 2015. The CAR connects Combatant Command priorities with actual MDA development activities and allows for an assessment of overall missile defense development trends. This process ensures a comprehensive and accurate description of the Combatant Commander's needs and the responsiveness of OSD and MDA to meeting those needs. In no case did the war fighter assess that progress toward achieving desired capabilities is unsatisfactory.

Cost, Schedule and Performance Trades. Missile defense cost, schedule and performance trade-offs, below the level of the Deputy Secretary of Defense, are executed at the MDEB. MDA uses Earned Value Management (EVM) in collaboration with the Defense Contract Command (and validated by joint MDA/DCMA Integrated Baseline Reviews), to ensure contractor cost, schedule and performance execution is rigorously implemented to rapidly identify program execution issues to expedite resolution. Additionally, knowledge points and definitive test assessments complement EVM to provide early insight into program progress. Execution issues, opportunities, and scope, specification and schedule trades are proposed to the MDEB on an as-needed basis to ensure senior DoD officials program expectations are met.

Preliminary Design Review. It is MDA policy to structure contracts using a framework of incremental knowledge points that provide insight into the achievement of meeting contract objectives. Evaluations of these knowledge points are conducted at Critical Design Reviews and Preliminary Design Reviews. Knowledge points form the basis for entrance criteria for Preliminary Design Reviews (PDRs), where we assess to what extent technologies are mature enough for achieving BMDS-required capabilities. PDRs ultimately support critical investment decisions.

Life-Cycle Competition. MDA is standardizing contracting methodologies to remove impediments to the program's life-cycle competitive contracting through a construct that: 1) ensures appropriate government rights to use contractor intellectual property and ensures the use of government-funded intellectual property; 2) ensures all government-funded infrastructure is transferable and fully documented; and 3) prohibits exclusive teaming arrangements where appropriate, ensuring the use of only highly qualified suppliers. Every opportunity to foster open competition will be pursued for all phases of missile defense programs.

Baselines. We recognize the need to incorporate the tenets of DoD 5000 to ensure programs are affordable, justified by the war fighter, and demonstrate acceptable risk through a milestone review process overseen by the MDEB. Also, we are segregating the management of our technology and development programs. Under my authority as the missile defense acquisition authority prior to initial production, potential programs that may provide technological or material solutions we need will undergo a milestone "A" decision to determine if they should become a program. These technology-based programs will be managed by knowledge points and incubated until maturity, at which time we will be able to make a milestone "B" decision as to whether they should be converted to a development program. We will be establishing baselines for our development programs.

Organizational Conflict of Interest. MDA strives to prevent Organizational Conflict of Interest (OCI) by rigorously applying prohibition of contracting for inherently governmental functions in the transition to new consolidated services contracts, prohibiting developmental contractors from participating in the requirements process, and tightening oversight of potential organizational conflicts involving our system engineers and support contractors. In compliance with Secretary of Defense direction, we are looking for opportunities to transition support contractors to government positions, thus reducing OCI concerns.

Acquisition Excellence. Implementation of a functional management construct (where the MDA acquisition workforce is assigned to functional areas rather than projects) has resulted in greater focus on our human capital development at the enterprise workforce level. Our functional managers maintain a broad focus on career development and education of acquisition professionals rather than a narrow focus on enhancing skills for current job performance. This often involves transferring personnel between assignments every few years to challenge them with new opportunities, education, and give them a greater acquisition experience base over their careers. In the functional acquisition area alone, over twenty very senior program managers or acquisition career field specialists have been moved between programs, bringing with them expertise, knowledge and a fresh focus. We seek to reward excellence with greater opportunities for career development and greater responsibilities.

Contract Management and Oversight. MDA has expanded our partnership with the Defense Contracting Management Agency (DCMA). For example, we have recently requested that DCMA provide: an independent review of the cost growth in our GMD intercept flight tests; an assessment of our supply chain vendor viability and compliance with best industry practices; a certification in preparation for contract re-competition activities; and an independent assessment of GMD EKV failures (including a validation that a EKV recently submitted to extensive over-testing is viable and ready for use). Finally, we are assessing how we can benefit from DCMA's risk management best practices.

MDA Contract Cost Overruns

In a March 2009 report, the Government Accountability Office (GAO) noted that 11 of 14 MDA contractors overran their FY 2008 budgeted costs by $152 million, or 3.7 percent. STSS accounted for more than 50 percent of the $152 million FY 2008 overrun. Technical issues caused most of the overruns seen with STSS. The GAO report also noted that Aegis BMD (SM-3 interceptor deliveries), the GMD prime, and MKV (engagement management algorithm development) performed their FY 2008 scope of work under budget. Since current BMDS contracts were initiated, we have had 31 contract realignments, adding nearly $14 billion to the value of the contracts. MDA realigns contracts as required to accurately reflect contract changes, technical redirection, contractor internal replanning, and the impacts of program funding changes. Our contractors' Earned Value Management (EVM) Systems require them to update the Integrated Master Schedule and related Performance Measurement Baseline (PMB) in a timely manner to reflect an accurately planned program after programmatic decisions have been made. This helps to ensure cost metrics are realistic and used to understand cost trends, causes, and impacts, which in turn helps to ensure continuous management and minimization of cost growth.

As of December 2008, MDA had a $37 billion contract budget base allocated to current MDA prime contracts, initiated between 1996 and 2009. With 71 percent of that contract work having been completed, we are estimating a total overrun of $2.1 billion or about 6 percent. We will continue to conduct a rigorous Integrated Baseline Review process with our contractors to help ensure we have executable programs and use EVM to effectively manage cost, schedule, and technical performance. Our cost overruns have been accommodated and addressed within the overall FY 2008 and FY 2009 MDA budget.

MDA and Mission Assurance. During the 1990s and early part of this decade, we painfully learned that missile defense systems have very little tolerance for quality control errors, as we experienced a number of flight test failures. Out of necessity, MDA nurtured a culture of mission assurance within the Agency and within the missile defense industry. Today, quality control and mission assurance remain the Agency's highest priority. The Agency performs routine mission assurance evaluations and has permanent Mission Assurance Representatives at several sites.

I am concerned with lapses in quality management involving several of our industry partners that have impacted system element cost, schedule, and performance. There have been frequent schedule slips on the STSS program, some resulting in significant delays, due to quality issues caused by lack of discipline and detail in the procedures. Similarly, we have recently suffered over 50 days of manufacturing delays due to a lack of discipline during EKV assembly and testing. There are many other examples over the past year. We are working closely with DCMA to hold our industry partners accountable and sufficiently improve contractor execution of quality control in their manufacturing facilities.

Improving BMD Test Planning

We are requesting $967 million in FY 2010 for test and targets compared to the $912 million appropriated for FY 2009. Our commitment is to prove, through comprehensive testing, that the ballistic missile defense system works. Evaluating the BMDS is likely one of the most challenging test endeavors ever attempted by the Department of Defense. Ideally, comprehensive and rigorous testing is enabled by a stable configuration of the system being tested; a clearly defined threat; a consistent and mature operational doctrine; sufficient resources to repeat tests under the most stressing conditions; and a well-defined set of criteria of acceptable performance. Unfortunately, none of these situations applies to the BMDS. The hardware and software configurations of the BMDS frequently change since the system elements are still under development. There are many significant uncertainties surrounding the nature and specifics of the ballistic missile defense threat. Moreover, the operational doctrine for simultaneous theater, regional, and homeland defense is immature. Finally, costs range between $40 million to over $200 million per BMDS flight test, making the repetition of a complex flight tests cost-prohibitive.

In light of these challenges, the BMDS performance evaluation strategy is to develop models and simulations of the BMDS and compare their predictions to empirical data collected through comprehensive flight and ground testing to validate their accuracy, rather than physically testing all combinations of BMDS configurations, engagement conditions, and target phenomena. We are changing from an architecture-based goal approach to a parameters-based test-objectives approach. The focus of the on-going BMDS test review has been to determine how to validate our models and simulations so that our war fighting commanders have confidence in the predicted performance of the BMDS, especially when those commanders consider employing the BMDS in ways other than originally planned or against threats unknown at this time.

In Phase I of the test review, MDA and the multi-Service Operational Test Agency (OTA) Team studied the BMDS models and simulations and determined the variables (key factors) most sensitive to the predicted results. The OTAs and MDA then combined sets of key factors with test conditions that provide the greatest insight into the BMDS models' predictive capability, when compared to test results, and called them Critical Engagement Conditions (CECs). However, there are many cases where the only practical way to measure, rather than simulate, performance is by ground or flight testing under operationally realistic conditions. OTAs and MDA call these tests Empirical Measurement Events (EMEs). Much of the data needed for the OTA Critical Operational Issues (COIs), such as survivability, reliability, performance in extreme natural environments, and supportability, can only be collected through the conduct of EMEs. MDA then combined the CECs, EMEs, and COIs into test objectives. Phase I identified the need to collect data for 101 CECs and EMEs in order to accredit the BMDS models and simulations and facilitate comprehensive operational assessments.

In Phase II, the OTAs and MDA combined these critical test objectives and selected 144 test scenarios, including 56 flight tests involving 37 tests where threat targets are intercepted. These test objectives not only address data necessary to validate the models of individual missile defense interceptor systems, but also demonstrate the performance of the BMDS working as an integrated system. The OTAs and MDA prioritized the resulting test scenarios according to the need to determine BMDS capabilities and limitations and the Combatant Commanders' urgency of need for a specific missile defense capability.

In Phase III, the OTAs and MDA will determine the funding and infrastructure necessary to implement the test campaigns identified in the second phase. A key cost driver will be the ability to establish an inventory of reliable target configurations that will satisfy test objectives over a variety of BMDS flight tests.

At the conclusion of the three-phase test plan review, the OTAs and MDA will produce, with full involvement by DOT&E and STRATCOM JFCC-IMD, an Integrated Master Test Plan (IMTP) that is event-oriented and extends until the collection of all identified data is completed to ensure adequate test investments.

Flight Test Cancellations. Missile defense ground tests, flight tests and exercises represent a complex, interdependent orchestration of instrumentation, ranges, targets, interceptors, sensors, and war fighters. MDA testers routinely encounter many factors that may disrupt the planned test schedule, including range conflicts, target and interceptor hardware and software failures during flight test preparations, and real-world events. Constant re-scheduling and deconfliction add to the complexity of MDA test program management.

Members of Congress have expressed concern over the Agency's restructuring of GMD FTG-04 (scheduled for the second quarter of FY 2008), a flight test that had already been slipped to accommodate the re-test of FTG-03, which was declared a "no test" in May 2008 because of a target failure. In April 2008, the GMD program office identified quality issues on a unit used for flight data encryption on the EKV to be flown in FTG-04.

After investigation to determine the cause and the development of a corrective action plan, the GMD Program Office determined the test interceptor would not be ready for the test until December 2008. As a result, MDA delayed the intercept portion of this flight test mission in order to address and correct the quality issue, and we restructured the mission from an intercept test to a non-intercept test, designated FTX-03, to demonstrate BMDS multi-sensor fusion functionality with a simulated GBI intercept. While the test successfully achieved a number of test objectives, the STARS/GROW target did not reach the intended simulated intercept point due to the failure of the adapter fairing panels to deploy, which precluded achieving some test objectives. As previously mentioned, we conducted an intercept test in December 2008.

I want to assure you that MDA is focused on conducting meaningful ballistic missile testing that rigorously demonstrates the capabilities of the BMDS. Executing our testing program in accordance with our testing schedule as established in the Integrated Master Test Plan is one of our highest priorities. Due to the increasing complexity of our test program, we may encounter technical issues in the future that may necessitate a delay in testing. When these issues become apparent, you have my personal commitment that MDA will consult with USD/AT&L, DOT&E and the Operational Test Agencies before deciding to delay or cancel a ballistic missile defense test.

Finally, in order to ensure our government and industry teams are not incentivized to avoid operationally realistic testing, I have directed we stop the practice of using award fee associated with flight test results. Instead, we will incentivize quality control in the manufacture of our hardware and software.

Ballistic Missile Targets

The Missile Defense Agency is fundamentally overhauling the target acquisition program to: 1) match the pace and increasing complexity of BMDS testing; 2) shorten the lead-time to contract, build, and deliver targets; 3) improve target program management; 4) improve target reliability; 5) reduce and control target program costs; and, 6) represent BMDS responses to dynamic intelligence and assure threat realism through a combination of flight test targets that represent basic target characteristics, ground tests, hardware-in-the-loop, simulations, and Foreign Material Acquisitions to provide high-fidelity representations.

In FY 2008 and FY 2009 to date, we launched 18 targets with four failures. Unfortunately, those failures had significant negative impacts on demonstrating key capabilities for both GMD and THAAD. We had two failures of the STARS target, which we will no longer be launching. Another failure was a foreign made target, and we have determined root cause and corrected that problem for the most recent THAAD test.

Target failures impacting our test schedules have driven us to adopt a new approach to acquiring targets. First, we have issued a Request for Information from industry to identify all potential sources of targets. After an assessment, we will determine if a competitive acquisition strategy would improve target cost, schedule, and performance issues. Second, we are standardizing target requirements based on intelligence data to emphasize the fundamental characteristics of each of the four target classes (SRBM, MRBM, IRBM, and

ICBM). This will allow the Agency to economically purchase greater quantities of basic threat representative targets. Third, to mitigate the likelihood that target failures will have a severe impact on our flight tests and development programs, we are implementing a "rolling spare" concept by building a target contingency inventory.

We began the "Flexible Target Family" (FTF) program in December 2003 to develop a single set of targets with common components that can be tailored to simulate known or potential short-, medium-, or long-range threats. Emphasis on common components and inventory buys down lead times for new missions and facilitates the quick tailoring of missions when needed.

Unfortunately, the FTF program has not met cost and schedule expectations to date. High costs and changes in target requirements led to the discontinuation of all variants except the 72-inch-diameter LV-2. Late production qualifications and environmental impact concerns has delayed the initial launch of the first long-range (72-inch) target until fourth quarter FY 2009. The 72-inch target, which is based on the newer Trident C4 motor, completed qualification testing in December 2008 in extremely rigorous environments.

Funding improvements also will help increase the quantity of targets available for testing. We have adopted a common cost model to help adjust out-year funding requirements with improved accuracy. With the FY 2009 Defense Appropriations Act, we transferred target funding from other program elements to a Test and Targets Program Element and were provided an additional $32 million for FTF to initiate an inventory build up of critical long-lead hardware items.

MDA Personnel/BRAC

The 2005 Defense Base Realignment and Closure (BRAC) Commission approved recommendations directing the realignment of several MDA functions from the National Capital Region (NCR) to government facilities at Fort Belvoir, Virginia, and the Redstone Arsenal in Huntsville, Alabama. Specifically, a Headquarters Command Center (HQCC) for MDA will be located at Fort Belvoir, while most other MDA mission and mission support activities originally in the NCR will be realigned to Redstone Arsenal.

In support of these realignments, MDA has awarded contracts to construct two new facilities: a $38.5 million Headquarters Command Center (HQCC) at Fort Belvoir, and a $221 million addition to the Von Braun Complex at Redstone Arsenal. Construction of the HQCC will begin this spring, with expected completion and occupancy in Fall 2010. The HQCC will accommodate 292 positions. Construction of the Von Braun III project is already underway. The Von Braun III facility is being constructed in two phases – with the first phase being readied for occupancy in the summer of 2010, and the second phase scheduled for completion and occupancy in the summer of 2011. The transfer of government and contractor positions from the NCR is in progress. MDA has already transitioned approximately 1,300 of the planned 2,248 positions to Huntsville / Redstone

Arsenal.   We are currently reassessing our facility needs in Huntsville given the anticipated expansion of our government acquisition workforce and the Secretary of Defense's PB10 guidance.

Conclusion

Proven missile defenses can enhance protection by dissuading potential adversaries from acquiring them, deterring against their use, and defending against a ballistic missile attack. Proven missile defense assets can contribute to strategic non-proliferation and counter-proliferation objectives by undercutting the value of offensive ballistic missiles and dissuading foreign investment in them.   Deployed missile defenses can bolster deterrence and give confidence to our allies and friends by reducing opportunities for adversarial intimidation or coercion and creating uncertainty in the minds of the potential adversaries of the effectiveness of an attack on U.S. or allied retaliatory military power. A robust research and development program focused on API can provide a significant "hedge" against advanced threats. If hostilities break out, missile defenses can limit damage to U.S. and allied critical infrastructure, population centers, and military capabilities for responsive operations.

The FY 2010 missile defense budget was the result of a comprehensive assessment of available and reasonably achievable capabilities, war fighter requirements, and development risks. It also provides a hedge against future uncertainty. With the $7.8 billion requested, MDA will implement a program strategy to improve the effectiveness and efficiency of developing the BMDS. While we are addressing challenges, our record of 16 of 18 successful intercept attempts over the past three years sends a clear message to potential adversaries considering the acquisition of ballistic missiles. But more work is needed to improve our oversight, collaboration with Combat Commanders and the Services, test planning, and program execution.

Missile defense is expensive, but the cost of mission failure can also be very high – the system must be affordable and effective. Integration of stand-alone missile defense systems into an integrated BMDS helps us achieve cost and operational efficiencies by improving protection with increased defended area and performance without incurring additional force structure costs. The Department is proposing a balanced program to develop, rigorously test, and field an integrated BMDS architecture to counter existing regional threats, maintain our limited ICBM defense, develop new technologies to address future risks, and become more operationally and cost-effective as we prepare to protect against the more uncertain threats of the future.

I greatly appreciate your support as we address issues associated with the BMDS, and I look forward to answering your questions.