RECORD VERSION

STATEMENT BY

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INTEGRATED MISSILE DEFENSE

BEFORE THE

COMMITTEE ON ARMED SERVICES
STRATEGIC FORCES SUBCOMMITTEE
UNITED STATES SENATE

SECOND SESSION, 114TH CONGRESS

BALLISTIC MISSILE DEFENSE PROGRAMS IN REVIEW OF THE DEFENSE AUTHORIZATION REQUEST FOR FISCAL YEAR 2017 AND THE FUTURE YEARS DEFENSE PROGRAM

APRIL 13, 2016

NOT FOR PUBLICATION
UNTIL RELEASED BY THE
SENATE ARMED SERVICES COMMITTEE

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Chairman Sessions, Ranking Member Donnelly, and distinguished Members of the Subcommittee, thank you for your continued support of our Service Members, Civilians, and Families. In the same capacity as my previous appearances before this subcommittee, I appear before you today bringing both a Joint and Army perspective on effective missile defense capabilities. Let me again express my appreciation to this Subcommittee for its continued support of the Army, the U.S. Strategic Command, the Department of Defense, and the missile defense community. I am honored to again testify before this Subcommittee along with these distinguished witnesses who provide missile defense capabilities to our Nation, forward deployed forces, partners, and allies.

As previously outlined during appearances before this subcommittee the last two years, my responsibilities encompass several main areas. First, as the Commander of the U.S. Army Space and Missile Defense Command (USASMDC), I have Title 10 responsibilities to man, train, maintain, and equip space and global ballistic missile defense forces for the Army. As Commander of USASMDC, I also serve as the Army's force modernization proponent for space, global ballistic missile defense, and high altitude forces and capabilities. Second, as the Commander, Army Forces Strategic Command (ARSTRAT), I am the Army Service Component Commander (ASCC) to the U.S. Strategic Command (USSTRATCOM). I am responsible for planning, integrating, coordinating, and providing all Army space and missile defense forces and capabilities in support of USSTRATCOM missions. Third, as the Commander of USSTRATCOM's Joint Functional Component Command for Integrated Missile Defense (JFCC IMD), I am responsible for synchronizing missile defense planning, supporting ballistic missile defense operations, recommending allocation of missile defense assets, and advocating for missile defense capabilities on behalf of the Combatant Commanders.

Lastly, I serve as the Army's Air and Missile Defense (AMD) Enterprise Integrator. My responsibility is to synchronize the balanced implementation of the Army's AMD strategy across the functions of force planning and sourcing requirements, combat and materiel development, AMD acquisition and life cycle management, and to orchestrate consistent strategic communication messaging themes.

In accordance with these responsibilities, my intent today is to again highlight the most significant missile defense asset—our great people; to briefly outline the strategic environment; to emphasize USASMDC/ARSTRAT's missile defense force provider responsibilities with respect to the Army and the Geographic Combatant Commanders (GCCs); to outline JFCC IMD's role as an operational integrator of Joint missile defense for USSTRATCOM; and finally to summarize a few of the key Army air and ballistic missile defense activities and developments in the context of a comprehensive approach to addressing an evolving ballistic missile threat.

The Workforce—Recognizing and Protecting Our Greatest Asset

The challenges that we face cannot be mitigated without the dedication of our greatest asset—our people. Just as I outlined during my previous appearances, I feel it important to highlight our workforce and my concern of potential out-year sequestration on our workforce. At USASMDC/ARSTRAT and JFCC IMD, our people remain our most enduring strength. The Service Members, Civilians, and Contractors support the Army and Joint Warfighter each and every day, both those stationed in the homeland and those globally deployed. We remain committed to providing trained and ready Service Members and Civilians to operate and pursue enhanced capabilities for the Nation's ballistic missile defense system (BMDS).

While the 2015 Bipartisan Budget Agreement provides some short term relief and stability, the potential future return of sequestration causes great concern—especially with regards to its impact on the workforce and our overall readiness. Within my commands, any future year sequestration will negatively impact the space and missile defense enablers our Soldiers and Civilians provide to the Combatant Commanders. Specifically, readiness, training, and enhancements to space and missile defense capabilities will be degraded. Also, a return of sequestration will negatively impact the

morale of our workforce. As stated last year, I believe that a more prudent course of action should be identified and implemented to ensure that we can continue to meet our current global responsibilities and those of tomorrow.

The Evolving Threat

Current global trends indicate ballistic and cruise missiles are becoming more complex, due in part to the increase in proliferation of advanced technologies, resulting in systems with greater ranges and accuracy. Additionally, many foreign ballistic and cruise missile systems are progressively incorporating advanced countermeasures including maneuverable reentry vehicles, multiple independent reentry vehicles, electromagnetic jamming, and hypersonics, with the purpose of challenging our ballistic missile defense systems. Moreover, ballistic and cruise missile platforms are increasing quantitatively, and as most are mobile field-based systems, is decreasing our ability to detect and track these systems before they are launched.

Numerous countries are developing ground-, sea-, and air-launched land-attack cruise missiles utilizing an assortment of unconventional and inexpensive launch platforms. Presently, nearly 30 countries possess ballistic missile capability. Together, these countries have approximately 50 different variants of ballistic missiles. Additionally, there are currently 13 new intermediate-range and eight intercontinental ballistic missiles (IRBM and ICBM) variants under development. As an example, North Korea, has probably tested ICBM capabilities in recent space launches and continues to develop the KN-08 road-mobile ICBM and an IRBM variant capable of reaching Guam and the Aleutian Islands.

"Maintaining the capability to deter and defeat attacks on the United States is the Department's first priority."

--Quadrennial Defense Review March 2014

In the future, our BMD systems will encounter more complex advanced electronic and cyber-attacks and will also need to combat directed energy capabilities that could significantly degrade US missile defense operations. It should also be expected that

cyber- and electronic-attacks will increasingly be part of an adversary's anti access/area-denial (A2/AD) approach.

To meet the objectives of the current Quadrennial Defense Strategic Guidance, USSTRATCOM and the Army continue to provide and enhance homeland and regional missile defense. In accordance with the Department's strategy to rebalance to the Asia-Pacific region, we have worked with partners in U.S. Pacific Command (USPACOM), U.S. Northern Command (USNORTHCOM), and USSTRATCOM to review and improve our capabilities in the USPACOM area of responsibility. In addition to the deployment of a Terminal High Altitude Area Defense (THAAD) battery in Guam, we have deployed an additional forward-based sensor in Japan to bolster our regional and homeland defense capabilities. The Army is presently working to forward station a THAAD battery on Guam to reduce the deployment turbulence and create more strategic flexibility in the THAAD force. We have completed the final environmental protection submission for the Fish and Wildlife Service and expect to have a long-term solution in place this year.

The emplacement of 14 additional Ground-Based Interceptors at Fort Greely, Alaska, scheduled for completion in 2017 and an Inflight Interceptor Communications System Data Terminal at Fort Drum, New York, will provide improved capability and capacity to defend the Nation against a limited ICBM attack. In addition, we continue to work with regional partners and allies to increase our information and data sharing and develop a global AMD force posture that leverages ever growing partner nations' capabilities. This will result in reduced strain on our force and enable more timely modernization of our AMD assets.

"Effective missile defense is an essential element of the U.S. commitment to strengthen strategic and regional deterrence against states of concern"

-- USSTRATCOM Posture Statement February 2016

The Quadrennial Defense Review also establishes a priority to maintain a strong commitment to security and stability in Europe, the Asia Pacific region, and the Middle East. In conjunction with our allies and partners, the DoD continues to maintain forward committed PATRIOT, THAAD, and Counter Rocket, Artillery and Mortar (C-RAM) air

and missile defense forces in order to enhance our current AMD posture while sending a strategic deterrence message to potential adversaries. The scope and quantity of these deployments result in a highly deployed and stressed Army AMD force. We must seek to balance today's operational requirements with shaping the force to counter future challenges. Our efforts must also include the critical modernization of our AMD force over the next five years.

In summary, enemy air and missile threats continue to develop in complexity, quantity and capacity. The evolution of multiple sophisticated capabilities requires a holistic approach that effectively integrates offensive and defensive, passive, kinetic and non-kinetic, and alternative capabilities to defeat air and missile threats. The growing complexity of the strategic environment based on technological advances of the threat and fiscal realities requires cost effective methods to integrate current and future capabilities. We continue to prioritize integrated air and missile defense resources to optimize all our capabilities in support of the Warfighter, particularly in light of the expense associated with traditional approaches. We continue to partner with the Missile Defense Agency (MDA), Combatant Commands, and Services to pursue a fiscally responsible path to keep pace with evolving threats by identifying and prioritizing capabilities that provide the greatest operational value.

Providing and Enhancing Missile Defense Capabilities

USASMDC/ARSTRAT, a force provider of missile defense capabilities, is manned by multi-component Soldiers, Civilians, and Contractors. Commands around the world, including USSTRATCOM, USNORTHCOM, and the GCCs, leverage our capabilities. Our Title 10 responsibilities include operations, planning, integration, control, and coordination of Army forces and capabilities in support of USSTRATCOM's missile defense mission. USASMDC/ARSTRAT also serves as the Army's global operational integrator for missile defense, the Army's proponent for global ballistic missile defense force modernization, and the Army's technical center lead to conduct air and missile defense related research and development in support of Army Title 10 responsibilities. As the Army AMD Enterprise Integrator, our tasks include working across the AMD community of interest to balance priorities, informing resourcing

decisions, and pursuing innovative approaches in order to enhance our strategic flexibility. The AMD Enterprise remains focused on meeting operational demands and AMD modernization initiatives. Achieving a balance of fiscal resources and force structure between operational requirements and timely development and implementation of the AMD modernization priorities is imperative. Collectively, the conduct and integration of these roles help to set conditions for the protection of GCCs and Joint Warfighters while maintaining their freedom of action, provide the ability to build and project combat power, and assure access to the global commons.

Our operational function is to provide trained and ready missile defense forces and capabilities to the GCCs and the Warfighter—in other words, to address the requirements of today. For example, USASMDC/ARSTRAT Soldiers serving in the homeland and in remote and austere forward deployed locations operate the Ground-based Midcourse Defense (GMD) system and the Army-Navy/Transportable Radar Surveillance Forward-Based Mode (AN/TPY-2 FBM) radars. Highlights of the missile defense capabilities provided by our missile defense professionals include:

Support to Global Ballistic Missile Defense: Soldiers from the 100th Missile Defense Brigade, headquartered in Colorado Springs, Colorado, and the 49th Missile Defense Battalion, headquartered at Fort Greely, Alaska, remain ready, 24/7/365, to defend our Nation and its territories from a limited intercontinental ballistic missile attack. Under the operational control of USNORTHCOM, Army National Guard and active component Soldiers operate the Ground-based Midcourse Defense Fire Control Systems located at the Fire Direction Center in Alaska, the Missile Defense Element in Colorado, and the GMD Command Launch Element at Vandenberg Air Force Base, California. These Soldiers, in conjunction with USNORTHCOM, also oversee the maintenance of GMD interceptors and ground system components. At the Missile Defense Complex at the Fort Greely site, 49th Missile Defense Battalion military police secure the interceptors and communications capabilities from physical threats.

> ***"…will remain ready to deter and defeat threats to the homeland…"***
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> ***-- National Security Strategy February 2015***

Recently, MDA completed the fielding of an additional Inflight Interceptor Communications System Data Terminal (IDT) at Fort Drum, New York. Just last month, the Army completed its Title 10 responsibilities and, in conjunction with USNORTHCOM, declared the IDT operational. In addition to increasing the overall effectiveness of the entire inventory of ground-based interceptors, the Nation's only active defense against an ICBM attack, the IDT will also greatly enhance the coverage and protection of the Eastern U.S.

GMD System Test and Development: Soldiers from the 100th Missile Defense Brigade actively participate in GMD test activities and continue to work with MDA developers on future improvements to the GMD system. The rigorous testing regime of MDA, conducted through their series of operational flight as well as ground-based tests, emphasizes operational realism during test design and execution. Therefore, in addition to gaining test data and insight, Soldiers of the 100th Missile Defense Brigade gain tremendous training value by executing their actual responsibilities while providing Warfighters with confidence the system will perform as planned in support of their Joint campaigns.

Support to Regional Capabilities: The 100th Missile Defense Brigade also provides GCCs with trained and certified AN/TPY-2 FBM radar detachments. These operational capabilities are present today at five strategic locations around the globe where they contribute to the early warning, cueing, tracking, and discrimination of threats to our friends and allies. These forward-based radars also represent a tangible contribution to regional defense that is the centerpiece of the Administration's Phased Adaptive Approach (PAA). In several instances, these Soldiers, deployed to remote and austere locations, are the only persistent demonstration of our national commitment and resolve to the PAA.

Ballistic Missile Early Warning: Space enabled capabilities are essential for missile defense operations. Everything from communications, precision navigation and timing, intelligence, surveillance, reconnaissance, and early warning are dependent on space enabled capabilities. Through the Joint Space Operations Center, we routinely coordinate and collaborate with the Joint Functional Component Command for Space

(USSTRATCOM) to ensure resilience of the space architecture that forms the backbone of the missile defense joint kill chain.

In support of the Joint Force Commander, USASMDC/ARSTRAT continues to provide ballistic missile early warning within various theaters of operations. The 1st Space Brigade's Joint Tactical Ground Station (JTAGS) Detachments, under the tactical control of USSTRATCOM's Joint Functional Component Command for Space, are operated by USASMDC/ARSTRAT space-professional Soldiers who monitor launch activity and other infrared events. They provide essential information to members of the air, missile defense, and operational communities. Our JTAGS Detachments are forward deployed around the globe, providing 24/7/365, dedicated, assured missile warning to USSTRATCOM and GCCs in support of deployed and forward-based forces. We continue to optimize this capability and this year we gained support from the Government of Italy to relocate the JTAGS in Europe to Sigonella Naval Air Station.

Our second major task is to build and mature future missile defense forces—our capability development function. These are the missile defense capabilities we will provide tomorrow. A major component of our capability development function is to provide relevant and updated training on our global missile defense systems. During the past fiscal year, USASMDC/ARSTRAT trained 185 Soldiers and was recertified as an Army Learning Institution of Excellence for missile defense training.

The Army uses established and emerging processes to document its missile defense needs and pursue Joint and Army validation of its requirements. As a recognized Army Center for Analysis, USASMDC/ARSTRAT conducts studies to determine how to best meet the Army's assigned missile defense responsibilities. With these insights, we develop and operationalize the Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities, and Policy (DOTMLPF-P) domains to address evolving threats and potential vulnerabilities to the GMD and AN/TPY-2 FBM missile defense systems. This disciplined approach helps to ensure limited resources are applied where Warfighter operational utility can be most effectively served.

Our third major missile defense task provides critical technologies to address future needs that will enhance Warfighter effectiveness—our materiel development

function. In USASMDC/ARSTRAT, our technology development function is primarily focused on the space and high altitude domains. However, while MDA is the principal materiel developer for ballistic missile defense capabilities, USASMDC/ARSTRAT has a number of supporting missile defense related materiel development efforts, to include supporting research and development of an OSD-sponsored conventional prompt global strike capability. These technical capabilities are at the forefront of developing holistic, cost-effective approaches to address the missile defense challenge. Following is a brief summary of two of our research and development efforts, as well as an overview of the capabilities of an essential Army testing range.

High Energy Laser Technology Development and Demonstration: The objective of the Army's high energy laser science and technology project is to develop laser system components, ruggedize and integrate them onto an Army vehicle, conduct demonstrations to characterize performance capability, and transition the technology to a Program Executive Office. A solid-state laser weapon system has potential to be a low cost, effective complement to kinetic energy capabilities in countering rockets, artillery, and mortars (RAM); unmanned aerial vehicles (UAVs); and other threats. The project is building upon pathfinder demonstrations with a 10 kilowatt-class laser system in 2013 and 2014, by continuing to develop and integrate technology at higher power and technology maturity levels. The next major demonstration will occur in 2018 following integration of a 50 kilowatt-class laser system onto a High Energy Laser Mobile Test Truck (HEL MTT). In 2015, the Army Science and Technology Working Group approved changes to the laser project to better align with the Army's Indirect Fire Protection Capability Increment 2 Block 1 (IFPC Inc 2-1) program. These changes will result in a pre-prototype laser weapon system demonstration, on a family of medium tactical vehicles variant, in the early 2020s designed to meet counter RAM requirements in the draft IFPC (IFPC Inc 2-1) Capability Development Document.

Providing Future Warfighters with Innovative Missile Defense Capabilities

Low-Cost Target Development: The Army continues to pursue a technology effort to develop a suite of low-cost targets for the Patriot testing program. The intent is

to design threat-representative targets at a substantially reduced cost for short-range ballistic missile testing. Over the past year, we completed detailed designs for three new short range ballistic missile targets leveraging existing excess solid rocket motors. The first risk reduction flight of these targets is planned for May 2016. The Army will realize significant savings conducting operational test events using these new targets beginning in Fiscal Year 2017. We will continue to leverage existing missile inventory and technology advancements to develop less expensive targets that are representative of real world threats.

Missile Defense Testing: USASMDC/ARSTRAT operates the Ronald Reagan Ballistic Missile Test Site (RTS). RTS, located on the U.S. Army Garrison—Kwajalein Atoll in the Republic of the Marshall Islands, is critical to both offensive and defensive missile testing requirements, such as the GMD system and the U.S. Air Force strategic ballistic missile systems. Including the recent successful MDA Warfighter and homeland defense tests, FTO-02E2 and CTV-02 respectively, these tests have grown ever more challenging and complex over the last few years, providing a means to replicate theater missile defense architectures superimposed over these Pacific test sites. Through shrewd and efficient resource investments, RTS retains preeminent missile defense testing capabilities and personnel to continue to provide critical testing support. In concert with its testing mission, Reagan Test Site conducts continuous deep space surveillance and space object identification operations to further increase national capabilities and reduce expenditures for both mission sets. During the past month, the U.S. Air Force began construction of their most advanced surveillance system—the Space Fence. In a few years, this improved surveillance capability will enable proactive space situational awareness while complementing existing systems at Reagan Test Site.

Joint Functional Component Command for Integrated Missile Defense—Synchronizing Global Missile Defense Planning, Force Management, and Operations Support

The Joint Functional Component Command for Integrated Missile Defense, or JFCC IMD, is USSTRATCOM's missile defense integrating element. Like the other

Joint Functional Component Commands, JFCC IMD was formed to operationalize USSTRATCOM missions and allow the headquarters to focus on integration and advocacy. Headquartered at Schriever Air Force Base in Colorado Springs, Colorado, the JFCC IMD is manned by professional Army, Navy, Air Force, Marine Corps, Civilian, and Contractor personnel.

As the Secretary of Defense and various Combatant Commanders have previously testified, the Warfighter remains confident in our ability to protect the Nation against a limited intercontinental ballistic missile attack, even in the face of the changing fiscal environment. While resources remain constrained, we continue to increase regional and homeland defense capabilities. We remain partnered with the GCCs and MDA to initiate development of future capabilities in the Long Range Discrimination Radar in Alaska, development of the Redesigned Kill Vehicle (RKV) for the next GBI upgrade, and various other improvements in the global missile defense capability.

Defense of the Homeland Priority Requires Execution of a Holistic Global Missile Defense Plan

On behalf of USSTRATCOM, JFCC IMD is working across the DoD enterprise to improve the integration of existing capabilities in order to maximize our efficiency and effectiveness to protect the homeland, deployed forces, partners, and allies. The key force multiplier is “integration,” which is a critically important mission area for JFCC IMD and directly supports USSTRATCOM’s assigned Unified Command Plan (UCP) responsibilities for missile defense.

As an operational and functional component command of USSTRATCOM, JFCC IMD has seven priorities for this year in support of USSTRATCOM UCP responsibilities:

- Remain postured to provide operational support during all missile events of interest and conduct BMDS asset management.
- Incorporate the Global Missile Defense CONOPS (GMDC) elements into policy, doctrine, and practice.
- Ensure operational realism and Warfighter priorities in tests to support operational acceptance of new capabilities.

- Conduct a holistic operational assessment through the Global Integrated Air and Missile Defense Assessment (GIAMDA) for advocacy of critical operational requirements to influence the missile defense investments.
- Recommend, through USSTRATCOM, the allocation of missile defense assets in support of geographic combatant command requirements and priorities.
- Evolve Joint BMD training to reflect technical and operational changes and improvements and to increase efficiency.
- Strengthen integration with USSTRATCOM subordinates and other organizations to improve cross-mission synergies.

To accomplish these priorities, we maintain close collaborative relationships with the GCCs, MDA, the Services, the Office of the Secretary of Defense (OSD), the Joint Staff, and our allies. We continually enhance our deployed capabilities while gaining operational experience and confidence in our collective ability to defend the Nation, deployed forces, partners, and allies. Some of our key efforts to enhance missile defense planning and capabilities for both the homeland and regional architectures follow.

Expansion and Integration of the Missile Defense Architecture: In response to the evolving strategic environment, we continue to bolster homeland and regional missile defense capabilities. Over the past year, we have deployed an additional AN/TPY-2 FBM radar to Japan, expanded the existing European Phased Adaptive Approach (EPAA) by operationalizing the Aegis Ashore capability in Romania, started construction of a second Aegis Ashore capability in Poland, upgraded Ft Greely, Alaska's existing GBI capability and inventory, and initiated key future capability developments in the Long Range Discrimination Radar and the RKV. Given many of the challenges associated with implementation of these architectures, JFCC IMD, in support of USSTRATCOM's global synchronizer role for missile defense, is

We will maintain "a robust missile defense capability to defend the homeland against a limited ballistic missile attack."

--Quadrennial Defense Review March 2014

collaborating with the GCCs to assess and address the cross-regional gaps in the areas of planning, policy, capabilities, and operations.

Global Planning and Assessment: Regional and global missile threats continue to increase in numbers and complexity. This year, after successfully completing a revision to the Global Missile Defense Concept of Operations, JFCC IMD operationalized many of the emerging processes identified in this seminal document. We led the missile defense community in an objective analysis of missile defense looking at risk from the lens of impacts across multiple GCC plans given a crisis with a single adversary problem set. This assessment will identify systemic risk, inform recommendations for shortfall mitigation, and improve effectiveness in missile defense planning. The output of this analysis directly informs the GIAMDA which serves to shape recommendations for global force management and advocacy efforts for future capability investments. We have completed the 2015 GIAMDA and its findings further underscores the holistic missile defense strategy that the Department is undertaking in technology development, allied integration, left-of-launch options, and cyber operations.

Global Force Management: USSTRATCOM, as the designated Joint Functional Manager for missile defense, relies upon JFCC IMD to evaluate and recommend sourcing of BMD requirements based on assessed risk. Due to the high demand, low-density nature of missile defense assets, all sourcing decisions have a direct and significant impact to other Combatant Commanders' campaign and contingency plans. This year, JFCC IMD participated in a Joint Staff led effort to develop a prioritization schema for global assets. This global Prioritized Defended List will categorize GCC critical assets based on global risk to inform the Global Force Management process and enable senior leaders to make more informed decisions on the allocation of low density missile defense forces.

Multi-Regional BMD Asset Management: JFCC IMD, in coordination with USSTRATCOM and the GCCs, manages the availability of missile defense assets to balance operational readiness postures, scheduled and unscheduled maintenance activities, and the MDA and Services' test requirements. This important process allows us to continually assess our readiness to defend against a ballistic missile attack and to recommend adjustments to optimize the overall BMD architecture.

Allied Ballistic Missile Defense Integration: JFCC IMD continues to focus on the integration of allies into regional missile defense architectures, enhanced security cooperation between missile defense capable nations, and shared regional deterrence and defense responsibilities across partner nations. One tool employed to promote cooperation is the NIMBLE TITAN campaign, a biennial series of multi-national missile defense experiments designed to explore policy and operational concepts required for coalition missile defense. The NIMBLE TITAN campaign provides a unique venue to advance U.S. missile defense policies and combatant command regional security objectives. The NIMBLE TITAN community of interest consists of 23 nations and 3 international organizations.

NIMBLE TITAN 16 includes Ministry of Foreign Affairs and Ministry of Defense representatives from North America, Europe, Middle East, and Asia-Pacific regions, along with Department of State, OSD, Joint Staff, MDA, and combatant command representatives. While past NIMBLE TITAN campaigns have focused only on Ballistic Missile Defense, NIMBLE TITAN 16 is the first campaign that expands the focus to Integrated Air and Missile Defense (IAMD), a growing area of concern for both the United States and many of our partner nations and allies. Other discussion topics include national policies and the need for increased regional and cross-regional coordination, sensor integration, and multinational MD planning solutions.

As the premier strategic/policy level focused missile defense event in the world, this campaign provides participating nations with critical opportunities for multi-national discussions and experience in information-sharing as well as command and control procedures that enhance synchronized missile defense capabilities. Conclusions derived from this campaign continue to inform real world policy decisions and multinational BMD planning

Joint BMD Training: In coordination with USSTRATCOM, the Joint Staff, Combatant Commands, and the Services, we have developed a comprehensive and innovative training program to close gaps between Service, Joint, and regional BMD training and education. This past September, we declared Final Operational Capability for the Joint BMD Training and Education mission. Nine new mission oriented courses have been developed and fielded to enhance combatant command and warfighter

training needs. Online, distant learning courseware offerings are under development to improve efficiency in delivery and reduce costs. Over the past year, JFCC IMD provided 199 courses to over 3444 students worldwide via the Joint BMD Training and Education Center and Mobile Training Teams. Additionally, in keeping with Joint Vision 2020, JFCC IMD provided training courses to ally and partner nations using both Military-to-Military and Foreign Military Sales Training venues. We developed and launched our Community of Practice, an interactive knowledge portal for the missile defense mission, providing virtual problem solving, idea sharing, standards-setting, relationship improvement, collaboration, and joint, cross-domain awareness. Over the next two years our primary goal is to establish and gain Joint Staff accreditation as a Joint Training Center of Excellence.

"…I believe it is imperative that the United States continue to develop more capable forces and broader options for effective missile defense."

-- USNORTHCOM Posture Statement March 2016

Warfighter Acceptance and Integrated Master Test Plan: As the missile defense architectures mature, Warfighters require a credible, comprehensive assessment of new capabilities to inform operational acceptance of emerging capabilities into the global BMDS. In 2015, we jointly conducted FTO-02 E1a to test the Aegis Ashore system with the SM-3 IB interceptor and, with FTO-02 E2a, performed an integrated BMDS test with Aegis BMD, THAAD, and AN/TPY-2 FBM simultaneously engaging SRBM, MRBM, and cruise missile targets in a layer defense to support the operational acceptance of the EPAA Phase II capability. For homeland defense capability, we participated in the January 2016 GMD CTV-02, demonstrating the Exo-atmospheric Kill Vehicle alternate divert thruster in support of GBI upgrade efforts and key discrimination capabilities for future sensor network improvements. In the coming year, the focus of our BMD tests is to begin demonstrating the operational capability of the SM-3 IIA interceptor capability for Phase III of the EPAA architecture and to test the GMD system's GBI Capability Enhancement-II Block I. The Warfighter relies on a robust and operationally relevant

test campaign to confidently field and integrate new capabilities into their existing Integrated Air and Missile Defense architectures.

In summary, JFCC IMD continues to expand our nation's global missile defense architecture and explore future capabilities to maintain operational advantage against current and future threats. Our competitive edge is maintained through our deliberate investments in our capability developments by MDA and the Services, investments in our warfighters through education and training, and expansion of our collaboration with allies and partners.

Army Contributions to the Nation's Missile Defense Capabilities

As we transition from an Army at war to one of deterrence, air and missile defense (AMD) units have become a key strategic enabler. AMD is an enduring Army core function and an essential component of the Army mission to provide wide area security and support Joint campaigns. In addition to defense against ballistic missiles, the current AMD strategy seeks to develop a more comprehensive portfolio of IAMD capabilities to provide protection against cruise missiles, unmanned aerial systems, and long-range precision rocket, artillery, and mortar attacks.

The Army works closely with MDA and continually supports its materiel development efforts to develop and field systems that are integral to our Nation's air and missile defense capabilities. To ensure the mission of providing trained and ready Army AMD forces, we continue to refine and implement the strategic direction of the Army's AMD strategy. A summary of the Army's major air and missile defense ongoing strategic direction and programs, both specified and implied, follows.

Air and Missile Defense Readiness: Readiness remains the Army's top priority and the challenges to sustain the readiness of the total Army AMD forces requires constant vigilance and senior leader focus. The operational demand on the Army AMD force to meet the requirements of the Joint Warfighters continues to stress the force, impacting both current and future readiness, as well as modernization initiatives. With over 50 percent of the AMD force either forward assigned or deployed, the Army has taken steps to mitigate this stress and restore strategic flexibility. Implementation of a Sustainable Readiness Model, an Army Campaign Plan strategic effort, supported the

characterization of the challenge. A recent study on striking a balance between operational demand and modernization led to the activation of an AMD test detachment in Fiscal Year 2018. This same study supported normalization of AMD rotations to nine months vice the current 12 month cycle.

Mission Command: Closely linked to the challenge of sustaining AMD readiness is the ability to provide low density/high demand AMD command and control elements. The command and control elements are especially critical to enable the integration of total Army AMD forces into Joint operational and technical architectures. Operationally, the Army recently activated a third Air Defense Brigade Headquarters within the South Carolina Army National Guard to support command and control rotations for the integrated air defense mission of the National Capital Region. Additionally, a sixth active duty air defense brigade headquarters will soon be activated. Beginning next fiscal year, the Army will begin fielding five Dismounted PATRIOT Information Coordination Centrals (DPICC) to the Army Air and Missile Defense Commands (AAMDC), which will mitigate the requirement to deploy a Patriot Headquarters element with each 1-2 battery deployment. These operational measures are being conducted in concert with technical measures, specifically the development of the Army IAMD Battle Command System (IBCS), which will facilitate the optimal pairing and provide additional time to prosecute tracks to enhance selective target engagement and improve combat identification. The Army PATRIOT force remains the cornerstone of AMD protection for our deployed forces, friends, and allies.

Army Integrated Air and Missile Defense (IAMD): As we continue to transition from an Army at war to one of deterrence, AMD units remain a key strategic enabler. AMD is an enduring Army core function and an essential component of our mission to provide wide-area security. In addition to providing defense against ballistic missiles, the current AMD strategy continues to develop a more comprehensive portfolio of IAMD capabilities to provide protection against cruise missiles, unmanned aerial systems, fixed and rotary wing aircraft, and long-range precision RAM attacks.

The IBCS remains an Army priority effort and serves as the foundation for Army AMD modernization. Modernization is critical to stay ahead of the advancement of the threat. The program will field a common mission command system to all echelons of

Army AMD forces in order to defend against cruise missiles, manned and unmanned aircraft, air-to-ground missiles, tactical ballistic missiles, and RAM attacks. The IBCS network will be capable of coordinating air surveillance and fire control across Services and with coalition partners, enabling over-the-horizon engagements that provide Joint Warfighters with more decision space and time. In 2015, the IBCS successfully executed two flight tests. During the March test, the IBCS coordinated the engagement of a surrogate tactical ballistic missile utilizing a PATRIOT radar and interceptor on the Integrated Fire Control Network. In the November test, the IBCS coordinated the engagement of a surrogate cruise missile utilizing Sentinel radar data and a PATRIOT interceptor. This was a first of its kind engagement with a PATRIOT engaging a target using Sentinel radar data. When fielded, in 2019, IBCS will componentize the AMD force, breaking the current system-centric control paradigm, which will dramatically increase capability and also facilitate open industry competition in support of the AMD community. Additional efforts are currently underway to integrate the Army's IBCS and MDA's BMD System Command, Control, Battle Management, and Communications (C2BMC) in order to fully support integrated air and missile defense interoperability with the ballistic missile defense system.

The IBCS and inherent integrated fire protection efforts will provide the future force with a means to defend against cruise missiles, unmanned aerial systems, and long-range precision rockets, artillery, and mortars. However, the Army must also be trained and ready to fight tonight. Recent conflicts, for example in the Ukraine and Israel, have highlighted the growing threat of UAS in support of tactical operations. This poses an increasing risk to the Army's combined arms team who are operating where the strategic and operational advantage of highly technical stand-off weapons have limited utility. A coordinated effort involving the Army Staff, the Fires Center, PEO M&S, and select ASCCs is underway now to investigate holistic approaches to enable the Army to fight tonight against these emerging threats. The technical options under consideration run the gamut from assessing pre-PAC-3 missiles to leveraging older generation interceptors in the inventory to opportunities for the acceleration of existing AMD modernization plans. Operationally, the team is assessing the ability to leverage capabilities of the other Services, as well as the integration of allied contributions.

Senior Army leaders acknowledge that these options may require reprogramming within the current Defense plan and await the team's report this summer.

PATRIOT/PATRIOT Advanced Capability-3 (PAC-3): In support of the GCCs increasing air and missile defense demands, operational tempo and stress remain high. To meet these demands, reduce stress, and avoid adversary overmatch, the Army has implemented a comprehensive modernization strategy that replaces PATRIOT's command and control hardware while upgrading the radar, launcher, and interceptor components through competitive development and procurement. The strategy's aim is to increase reliability, drive down operational and sustainment costs, in light of an evolving threat. The three significant facets of this strategy—the development of IBCS, radar and launcher modernization, and the PAC-3 Missile Segment Enhancement (MSE), are critical to our Nation's ability to provide GCCs with greater strategic flexibility and enhanced capabilities.

A number of significant PATRIOT/PAC-3 capability enhancements have been accomplished over the past year. Among the accomplishments were the completion of the Army's planned fielding of Post Deployment Build (PDB) 7 software and the modern adjunct processor to all fifteen PATRIOT battalions and achievement of first unit equipped with the next generation PAC-3 missile, the MSE, two months ahead of schedule. The PAC-3 MSE Initial Operational Capability (IOC) is planned for next year.

PATRIOT must continually modernize through PDBs software and hardware upgrades to avoid obsolescence and provide initial launch capability of the PAC-3 MSE interceptor. As part of this continuing modernization strategy, the Army is in the process of delivering the next software build, PDB-8. The PDB-8 software upgrade has successfully completed three live fire test events, the most current occurring last month, and is on schedule to complete developmental testing this year. The PDB-8 software IOC is planned for Fiscal Year 2018, which when fielded, will exploit the expanded kinematic capabilities of the PAC-3 MSE interceptor. The Army continues to move forward with the next generation sensor for the PATRIOT system. An analysis of alternatives has been completed for the Lower Tier Air and Missile Defense Sensor and an Army Requirements Oversight Council review will occur soon.

Finally, while these Patriot modernization efforts are an imperative to retaining an operationally relevant capability and not risking obsolescence as threat capabilities seek to outpace the Patriot, we still remain committed to balancing modernization with operational demand and strategic flexibility requirements. We can point to the Army's recent, no-notice, deployment, integration, and redeployment of Global Response Force Patriot forces from Ft Bliss, Texas to South Korea as evidence of this commitment, and of the readiness of the force.

Terminal High Altitude Area Defense System: THAAD, a key component of the BMDS architecture, is designed to defend deployed and allied forces, population centers, and critical infrastructure against short and medium-range ballistic missiles. THAAD is a high demand, low-density asset that is mobile and globally transportable. A fully operational THAAD battery consists of 95 Soldiers, an AN/TPY-2 radar, six launchers, a fire control and communications element, a battery support center, and a support element. THAAD has a unique intercept capability in both the endo- and exo-atmosphere using proven hit-to-kill technology. There are now four available THAAD batteries. Equipment training and fielding is on-going for a fifth unit and it will be operationally available next fiscal year. In April 2013, one of these batteries conducted the first-ever operational deployment of THAAD in response to the escalation of tensions in the Pacific region. By 2019, the THAAD force is scheduled to consist of seven batteries. A new training facility, which enables virtual training for the Soldiers who will operate the THAAD system, is operating at Fort Sill, Oklahoma. The addition of THAAD capabilities to the Army's air and missile defense portfolio brings an unprecedented level of protection against missile attacks to deployed U.S. forces, partners, and allies.

Integrated Fire Control Capability Increment 2 Block 1 (IFPC Inc 2-1): As the operational life cycle of short-range AMD capabilities such as Avenger draw to a close, the Army is developing capabilities to defeat cruise missile, UAS, and RAM threats. The IFPC Inc 2-1, currently under development, is a mobile, ground-based weapon system designed to provide 360-degree protection capability for these threats. A block acquisition approach is being used to provide this essential capability. The Block 1 System will consist of an existing interceptor, sensor, utilize the IBCS for command and

control, and the development of technical fire control and a multi-mission launcher to support the counter UAS and cruise missile defense missions. The Block 2 System will develop interceptors, sensors, and technical fire control to support the counter RAM mission. The IFPC Inc 2-1 System will be compatible with the Army IAMD command and control architecture. The IFPC Inc 2-1 System will be transportable by Army common mobile platforms and is scheduled to provide IOC capabilities against cruise missile and UAS threats in Fiscal Year 2020.

Conclusion

Mr. Chairman and Ranking Member Donnelly, as a member of the Joint missile defense community, the Army continues to pursue enhancements to the Nation's missile defense system, both at the strategic and tactical levels. As a Service, the Army has lead responsibility for GMD, AN/TPY-2 FBM, IFPC Inc 2-1, IBCS, PATRIOT, and THAAD. Our trained and ready Soldiers operating GMD elements in Colorado, Alaska, New York, California, and from remote, globally deployed locations, remain on point to defend the homeland against a limited intercontinental ballistic missile attack. As a force provider to the GCCs, our Soldiers provide essential regional sensor capabilities and ballistic missile early warning. Our regional forces continue to leverage ally collaboration and planning efforts in developing integrated and interoperable defenses against the various threat sets. USSTRATCOM, through the JFCC IMD, continues to integrate BMDS capabilities to counter global ballistic missile threats and to protect our Nation, deployed forces, partners, and allies.

While the operational, doctrine, and materiel development enhancements of the BMDS are essential, our most essential assets are the Soldiers, Sailors, Airmen, Marines, Civilians, and Contractors who develop, deploy, and operate our missile defense system. I appreciate having the opportunity to address missile defense matters and look forward to addressing your questions.