RECORD VERSION

STATEMENT BY
LIEUTENANT GENERAL JAMES H. DICKINSON, USA
COMMANDING GENERAL,
U.S. ARMY SPACE AND MISSILE DEFENSE COMMAND/
ARMY FORCES STRATEGIC COMMAND
AND
JOINT FUNCTIONAL COMPONENT COMMAND FOR
INTEGRATED MISSILE DEFENSE

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COMMITTEE ON ARMED SERVICES

Lieutenant General James H. Dickinson, USA
Commanding General
U.S. Army Space and Missile Defense Command/
Army Forces Strategic Command
and
Joint Functional Component Command for
Integrated Missile Defense

Chairman Rogers, Ranking Member Cooper, and distinguished Members of the Subcommittee, thank you for your continued support of our Service Members, Civilians, and Families. I appear before you today bringing both a Joint and Army perspective on effective missile defense capabilities. Let me 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 testify before this Subcommittee along with these distinguished witnesses who provide missile defense capabilities to our Nation, forward deployed forces, partners, and allies.

As outlined by my predecessors during appearances before this subcommittee, 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 organize, train, 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, conducting ballistic missile defense operations support, 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 execution 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 highlight our greatest asset—our 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 air and missile threat.

The Workforce—Recognizing and Protecting Our Greatest Asset

The challenges that we face cannot be addressed without the dedication of our greatest asset—our people. I feel it is important to highlight our workforce and my concern of potential future year sequestration on our workforce. At USASMDC/ ARSTRAT and JFCC IMD, our people remain our greatest asset. 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 advancements of space and missile defense capabilities for the Nation.

The Evolving Threat

Current global trends indicate ballistic and cruise missiles are becoming more complex, due in part to the 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 defeating our ballistic missile defense systems. Moreover, ballistic and cruise missile platforms are increasing quantitatively,

and as most are mobile field-based systems, are 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 and some are actively pursuing hypersonic weapons. There are approximately 50 different variants of ballistic missiles with 13 new intermediate-range and eight intercontinental ballistic missiles (IRBM and ICBM) variants under development. As an example, in recent months, North Korea has conducted an unprecedented number of test launches of systems, some of which may be capable of reaching Guam and the Aleutian Islands.

> ***"….Iran presents several credible threats. They have a robust theater ballistic missile program…."***
>
> ***-- USCENTCOM Posture Statement March 2017***

In the future, our missile defense systems will encounter more complex electronic and cyber-attacks and will also need to combat directed energy capabilities that could significantly degrade U.S. missile defense operations. Also, we expect cyber- and electronic-attacks will increasingly be part of an adversary's anti-access/area-denial (A2/AD) strategy. Enhancing our ability to successfully counter these continuously advancing threats lies in the increased use of space and space enabled capabilities. Improved and additional space sensors will expand our capacity to track, discriminate, and successfully engage threat ballistic and hypersonic missiles.

To meet the objectives of the current Quadrennial Defense Review, 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 the Terminal High Altitude Area Defense (THAAD) battery in Guam and the two forward-based sensors in Japan to bolster our regional and homeland defense capabilities, we are re-stationing a THAAD battery to Korea as part of the Republic of

Korea and United States alliance. We are now working with our host nation counterparts to operationalize the unit this calendar year. To minimize costs, we plan to position the unit's supporting infrastructure within an existing U.S. Army Garrison Korea footprint. Finally, the Army has approved a sixth Air Defense Artillery (ADA) Brigade headquarters that will be stationed in PACOM in Fiscal Year 2019.

The emplacement of 14 additional Ground-Based Interceptors (GBIs) at Fort Greely, Alaska, scheduled for completion in 2017, and the addition of an Inflight Interceptor Communications System Data Terminal at Fort Drum, New York, provide improved capability and capacity to defend the Nation against an ICBM attack from both North Korea and Iran. With the additional 14 interceptors, the Nation will have a total of 44 GBIs by the end of this calendar year. 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.

The Quadrennial Defense Review also establishes a priority to maintain a strong commitment for 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.

> ***"…initiate a new Ballistic Missile Defense Review to identify ways of strengthening missile-defense capabilities, rebalancing homeland and theater defense priorities, and highlighting priority funding areas."***
>
> **--National Security Presidential Memorandum**
> ***January 2017***

In summary, adversary air and missile threats continue to develop in complexity and capacity. The evolution of capability advancements 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 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 address the 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

"…develop a state-of-the-art missile defense system to protect against missile-based attacks. …"

-- POTUS Statement
Making Our Military Strong Again
January 2017

focused on meeting operational demands and AMD modernization initiatives. It is imperative that we achieve the correct balance of fiscal and force structure resources for today's operational requirements and the continued development and implementation of tomorrow's AMD capabilities. 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, providing the ability to build and project combat power, and assuring 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 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 an 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 Fort Greely, a remote site with limited community support amenities, 49th Missile Defense Battalion military police secure the interceptors and command and control facilities from physical threats. Considering the strategic mission, the remote location, the very harsh environment, and the 20-hours per day of winter darkness, we must continuously review and enhance the Fort Greely Garrison services and support to the Soldiers, Civilians, Contractors, and their Families. I request your

continued assistance with ensuring these remotely stationed personnel are provided adequate housing, medical, educational, and family support facilities and services.

In March 2016, the Army completed its Title 10 responsibilities and, in conjunction with USNORTHCOM, declared the In-flight Interceptor Communications System (IFICS) Data Terminal (IDT) at Fort Drum, New York operational. In addition to increasing the overall effectiveness of the GMD System, the Nation's only active defense against an ICBM attack, the IDT greatly enhances 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 designed in support of their Joint operations.

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 exist 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 both homeland and regional defense that is the centerpiece of the European Phased Adaptive Approach (EPAA) for missile defense. Soldiers manning these radars, deployed to remote and austere locations across the globe, are a persistent demonstration of our national commitment and resolve to defend deployed forces, allies, and friends from ballistic missile attacks.

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 USSTRATCOM Joint Functional Component Command for Space 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 the U.S. European Command (USEUCOM), the U.S. Central Command (USCENTCOM), and the USPACOM 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 which increases operational capability.

Missile Defense is Inextricably Linked to Capabilities Derived from Space-Based Assets

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 approximately 200 Soldiers that provide homeland defense 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) capabilities 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 strike capability. These technical capabilities are at the forefront of developing holistic, cost-effective approaches to address the missile defense challenge. The 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.

Providing Future Warfighters with Innovative Missile Defense Capabilities

High Energy Laser Technology Development and Demonstration: The objective of the Army's high energy laser science and technology effort is to develop ruggedized laser system components, integrate them onto an Army vehicle, conduct demonstrations to characterize performance, and to transition the technology to a Program Executive Office. A solid-state laser weapon system has the potential to be a low-cost and effective complement to kinetic energy capabilities in countering rockets, artillery, and mortars (RAM), unmanned aerial systems (UASs), and other threats. The effort is building upon 2013 and 2014 pathfinder demonstrations of a 10 kilowatt-class laser system by continuing to develop, integrate, and mature the technology at higher laser power outputs. The next key knowledge point 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 high energy laser demonstrator effort to better align with the

Army's Indirect Fire Protection Capability Increment 2-Intercept (IFPC Inc 2-I) program. These changes will result in a prototype laser weapon system demonstration, on a variety of medium tactical vehicles, in the early 2020s. The intent is for the High Energy Laser Tactical Vehicle Demonstrator to meet counter-RAM requirements in the IFPC Inc 2-I Capability Development Document.

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. In December 2016, we conducted the successful launch of the Zombie Pathfinder Target at White Sands Missile Range, New Mexico. This test provided verification of a new target design. The new target was launched off a Transportable Target Launcher platform, proved remote launch capability, achieved all performance metrics, and served as risk reduction for the dual launch Sabre (short range ballistic missile) targets in support of the upcoming June 2017 PATRIOT operational tests. Development of a two stage ballistic missile target, known as Black Dagger, continues with a risk reduction launch scheduled for early 2018. The goal of the Black Dagger target is to mimic a broader range of short range ballistic missile threats by achieving longer range, higher altitude, and increased velocity.

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. With regards to missile defense testing, RTS recently supported MDA's Flight Test Operational-02 Event 2 (FTO-02E2) and Ground-Based Midcourse Defense Controlled Test Vehicle-02+ (GM CTV-02+). FTO-02E2 demonstrated the ability of the Aegis Ballistic Missile Defense (BMD) and THAAD systems to defeat a raid of three near-simultaneous air and missile targets. GM CTV-02+ demonstrated the improved alternate divert thruster system of the GBI's Exo-atmospheric Kill Vehicle. These regional and homeland defense tests have grown ever

more challenging and complex over the years, providing a means to replicate theater missile defense architectures superimposed over these Pacific test sites. Through 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, RTS 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 year, the U.S. Air Force began construction of their most advanced surveillance system—Space Fence. In a few years, this improved surveillance capability will enable proactive space situational awareness while complementing existing systems at the RTS.

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 to Joint campaigns. In addition to defense against ballistic missiles, the current Army AMD strategy seeks to develop a more comprehensive portfolio of Integrated Air and Missile Defense (IAMD) capabilities. The Program Executive Office for Missiles and Space (PEO M&S) is the Army's materiel developer for these capabilities and works closely with the other Services, the Joint Staff, and MDA toward Joint Integrated 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 follows:

Air and Missile Defense Readiness: Readiness remains the Army's top priority and the challenge 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 stationed or deployed, the Army has taken steps to mitigate this stress to the force 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—we expect to achieve the shorter rotation cycle in the near future.

Mission Command: Closely linked to the challenge of sustaining AMD readiness is the ability to provide low density/high demand AMD mission command elements. The mission command elements are especially critical to support the integration of the total Army AMD forces into Joint command and control architectures. Operationally, the Army recently activated a third National Guard Air Defense Brigade Headquarters assigned to the South Carolina Army National Guard to support mission command 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 in USPACOM. Beginning next fiscal year, the Army will complete the development and procurement of five Dismounted PATRIOT Information Coordination Centrals (DPICC) for the Army Air and Missile Defense Commands (AAMDC), which will mitigate the requirement to deploy a Patriot Battalion 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).

Army Integrated Air and Missile Defense (AIAMD): With the continued growth of the regional ballistic missile threats, AMD units remain a key strategic enabler. In addition to providing defense against ballistic missiles, the current AMD strategy continues to develop a more comprehensive portfolio of AIAMD capabilities to provide protection against other adversary threat systems and capabilities.

The IBCS will provide integrated fire control of AMD sensors and shooters and provide additional time to prosecute tracks to enhance selective target engagement and improve combat identification. 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

for 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 interoperating with air surveillance and fire control capabilities across Services and with coalition partners that provide Joint Warfighters with more decision space and lethality. When fielded, IBCS will enhance the lethality of 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 indirect fire protection efforts will provide the future force with a capability to defend against cruise missiles, unmanned aerial systems, and long-range precision rockets, artillery, and mortars. However, the Army also must be trained and ready to fight tonight. Recent conflicts, for example in the Ukraine and the Mideast, highlight the growing threat of UAS in support of tactical operations. They pose 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 approaches to enable the Army to fight tonight against these emerging threats.

PATRIOT/PATRIOT Advanced Capability-3 (PAC-3): The Army PATRIOT force remains the cornerstone of AMD protection for our deployed forces, friends, and allies. The GCCs increasing air and missile defense requirements ensure that the operational tempo and stress on the PATRIOT force remain high. To meet these requirements, reduce stress, and avoid adversary overmatch, the Army is improving PATRIOT capability against the near term evolving threat while we move toward the IBCS architecture including IFPC and a new Lower Tier Air and Missile Defense Sensor (LTAMDS).

PATRIOT must continually modernize through software and hardware upgrades to avoid obsolescence and to take advantage of the expanded battle space afforded by

the PAC-3 MSE interceptor. To counter the near term threat, the Army is in the process of delivering the next PATRIOT software build, Post Deployment Build (PDB-8). PDB-8 software enables integration with IBCS, provides combat identification enhancements, addresses upper tier debris mitigation, improves performance of the PAC-3 Missile Segment Enhancement (MSE) interceptor, and enhances Patriot and THAAD interoperability. To support recapitalization of the 35th Air Defense Artillery Brigade, PBD-8 Urgent Materiel Release (UMR) was approved in July 2016. Initial Operational Test & Evaluation (IOT&E) began in September 2016. The PDB-8 Materiel Release is planned for early 2018.

Finally, we will continue our commitment to balancing modernization with operational demand and strategic flexibility requirements. This will enhance our ability to stay ahead of rapidly evolving threats while meeting warfighting demands. We point to the Army's recent exercise deployment, integration, and redeployment of the Patriot Global Response Force from Ft Bliss, Texas to South Korea as evidence of this commitment and of the readiness of the Army's PATRIOT force.

Lower Tier and Missile Defense Sensor (LTAMDS): The LTAMDS program will provide the required sensing capabilities for Lower Tier Air and Missile Defense. LTAMDS will operate on the integrated fire control network and address critical capability gaps, modernize technology, reduce operation and sustainment costs, mitigate obsolescence, and increase reliability and maintainability. LTAMDS will be procured through a full and open competition acquisition strategy with the objectives of addressing existing and future capability gaps and threats, improving reliability, and reducing sustainment costs.

Terminal High Altitude Area Defense System: THAAD, a key component of the BMDS architecture, is designed for area defense of 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 five

available THAAD batteries. Fielding is ongoing for the sixth and seventh batteries and both will be operational by the end of 2018. 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. We are deploying another THAAD battery this year to the Republic of Korea in response to the increasing nuclear and missile threat posed by North Korea. A new training facility, which enables virtual training for the Soldiers who will operate the THAAD system, is active 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.

Indirect Fire Protection Capability Increment 2 – Intercept Block 1 (IFPC Inc 2-I): As the operational life cycle of short-range AMD capabilities such as Avenger draw to a close, the Army is developing capabilities to defeat air, cruise missile, UAS, and RAM threats. The IFPC Inc 2-I, 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 baseline system, consisting of an existing interceptor and sensor and utilizing the IBCS for integrated fire control, will include a multi-mission launcher to support the counter UAS and cruise missile defense missions. An engineering demonstration of the IFPC system was successfully completed in March 2016 which included the effective utilization of four different interceptors. The program underwent its Milestone B (MS B) Army Systems Acquisition Review Council (ASARC) review late last year. The program will enter the Engineering Manufacturing and Design phase upon receipt of the MS B Acquisition Decision Memorandum (ADM). Fielding of the Block 1 baseline counter-UAS/Counter-cruise missile capability is slated to begin in Fiscal Year 2020. Additionally, as part of the Block 1 program, a second missile will be added to provide an initial counter-RAM capability beginning in Fiscal Year 2022. The Block 2 System will provide a full counter-RAM capability by integrating additional capabilities to support the counter RAM mission. A full counter-RAM capability could be achieved by Fiscal Year 2028 for a kinetic energy solution and by Fiscal Year 2032 for a directed energy weapon.

Short-Range Air Defense (SHORAD): As short range air threats increase, the Army is increasing capabilities to address these threats to our deployed forces and allies. The Army is currently executing plans to expand SHORAD capabilities, not only with additional forces but also with new equipment, especially in the European theater. Increasing the SHORAD force is a reversal of a decade long decline in SHORAD personnel. While the current SHORAD systems, Avenger and Stringer missiles, provide capabilities for today's threat, continued advancement in our adversary's capabilities requires the development and fielding of more advanced systems. In addition to IFPC, continued research and development investments in lasers, high power microwaves, and electronic warfare are essential to increase SHORAD capabilities in support of the maneuver force.

> ***"We lack the capability and capacity to meet the AMD demands of the combatant commanders to cover key fixed sites and provide effective AMD protection of the maneuvering forces."***
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> ***--Army G3/G8 HASC TALF Subcommittee Written Statement March 2017***

Joint Functional Component Command for Integrated Missile Defense—Synchronizing Global Missile Defense Planning, Force Management, Operations Support, Warfighter Advocacy, and Conducting Training and Education

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 intercontinental ballistic missile attack, but we need to continue our investments in missile defense technology to keep pace with the rapidly evolving threat. JFCC IMD's principal mission is to collaborate and support the joint Warfighters at the Geographic Combatant Commands (GCCs) and the materiel developers in MDA and the Services. On behalf of the GCCs and USSTRATCOM, JFCC IMD champions the Warfighters' priorities and capability needs, including the development of the Long Range Discrimination Radar in Alaska, development of the Redesigned Kill Vehicle (RKV) for the Ground-Based Interceptor (GBI), key regional missile defense capabilities, and various other improvements in the global missile defense capability.

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

JFCC IMD is working across the DoD enterprise and with key allied and partner nations 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 a functional component command of USSTRATCOM, JFCC IMD executes our support to designated UCP responsibilities along five key lines of effort:

- Synchronize operational missile defense planning, security cooperation activities and global force management for missile defense capabilities.
- Conduct global ballistic missile defense operations support, asset management, alternate execution authority, and intelligence support.
- Integrate, synchronize, and conduct above element Joint Ballistic Missile Defense training, exercises, and test activities.
- Advocate and coordinate for global missile defense capabilities, conduct analysis and assessments of current and future capabilities, and recommend operational acceptance.

- Protect information systems and provide network support for missile defense operations.

To accomplish these efforts, we maintain close collaborative relationships with the GCCs, MDA, the Services, the Office of the Secretary of Defense (OSD), the Joint Staff, our allied and partner nations. 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 operationally accepted the Aegis Ashore capability in Romania as the centerpiece of the European Phased Adaptive Approach (EPAA) Phase II, extended the GMD capability against the threat to the homeland by emplacement of another Inflight Interceptor Communications System Data Terminal at Fort Drum, New York, and are steadily increasing the GBI inventory toward 44 GBIs by 2017. In support of the Global Missile Defense mission, we are advancing the development of new capabilities for the Aegis Ashore in Romania, the Standard Missile 3 block IIA (SM-3 IIA) under co-development with Japan, the Long Range Discrimination Radar, the Redesigned Kill Vehicle (RKV) for the GBI, and various other capabilities. Given many of the challenges associated with implementation of these architectures, JFCC IMD, in support of USSTRATCOM's coordinating role for global missile defense, is collaborating with the GCCs to assess and address the cross-regional gaps in the areas of planning, policy, capabilities, and operations.

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.

Global Planning and Assessment: Regional and global missile threats continue to increase in numbers and complexity. JFCC IMD continues to work with the missile defense community of interest to refine processes to synchronize trans-regional global missile defense planning and operations. Codified in periodic revisions to the Global Missile Defense Concept of Operations, these processes ensure unity of effort and mitigation of potential seams and gaps across geographical areas of responsibility. Key elements of this year's revision include updates to the Adversary Centric Plans Assessment, Global Prioritized Defended Asset List process and an establishment of an International Engagement Framework. Consistent with the Department's transition to planning based on problem sets, we refined our process for the adversary centric plans assessment and completed an additional objective analysis looking at missile defense risk to missions across multiple GCC plans associated with a given adversary. This assessment identified systemic risk, informed recommendations for shortfall mitigation, and will support GCC's increased effectiveness in future missile defense planning. The output of this analysis directly informs the Global Integrated Air and Missile Defense Assessment (GIAMDA) which serves to shape recommendations for global force management and advocacy efforts for future capability investments.

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. Last year, JFCC IMD further refined our approach to prioritize steady state global missile defense requirements. This global Prioritized Defended Asset List (Global PDAL) categorizes GCC critical assets based on global risk to inform our recommendations into the Global Force Management process and enable senior leaders to make more informed decisions on the allocation of low density missile defense forces.

Allied Ballistic Missile Defense Integration: Given that we will never have enough active defense capacity, the integration of allies into our architecture continues to be a critical Warfighter priority. In support of those efforts, our Global Missile Defense

CONOPS includes an International Engagement Framework which provides a common approach to identify potential partners, a model to identify a level of maturation and an assessment mechanism. This approach provides a common lexicon to report progress of allied capability development and integration and share best practices across the missile defense community.

One such venue that promotes increased cooperation is the NIMBLE TITAN experimentation 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 forum to advance U.S. missile defense policies and combatant command regional security objectives.

"We must strengthen our collaboration with our Allies and explore further integration of our collective capabilities toward an effective mutual defense."

-- USSTRATCOM Posture Statement April 2017

The NIMBLE TITAN community of interest has increased to 24 nations and four international organizations and includes participants from Ministries of Foreign Affairs and Ministries of Defense from North America, Europe, the Middle East, and Asia-Pacific regions, along with Department of State, OSD, Joint Staff, MDA, and the Combatant Commands. As the premier strategic and policy level focused missile defense event in the world, this campaign provides participating nations with critical opportunities for multi-national and cross-regional discussions and experience in information-sharing as well as command and control procedures that enhance synchronized missile defense capabilities.

Our efforts in NIMBLE TITAN 16 culminated in the February 2016 Capstone Wargame and a subsequent senior leader forum in June 2016 that was co-hosted by the Department of State. While past NIMBLE TITAN campaigns have focused only on ballistic missile defense, NIMBLE TITAN 16 was the first campaign that expanded the focus to integrated air and missile defense, a growing area of concern for both the United States and many of our partner nations and allies. Other discussion topics included national policies and the need for increased regional and cross-regional

coordination, sensor integration, and multinational MD planning solutions. We have completed concept development for the NIMBLE TITAN 18 campaign, and will conduct several events with the 28 member nations and international organizations to explore a wide range of potential military and political solutions to global IAMD challenges. NIMBLE TITAN has been a gateway for the United States to establish relationships with crucial international partners, as well as inform the missile defense policies of nations and organizations such as NATO. Conclusions derived from this campaign will continue to inform real world policy decisions and multinational MD planning.

Additionally, we are working to integrate Allies directly into the JFCC IMD staff through the Foreign Liaison Officer (FLO) program. We recently added the first German Air Force officer and are seeking to add additional Foreign Liaison Officers to increase our understanding of allied missile defense policies, capabilities, and planning in order to better optimize the Nation's planning and force allocation.

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. Over the past year, we completed development of the first Joint Training Center of Excellence framework and are on track to complete certification this year. In addition to our nine mission-oriented courses, we have published an online orientation course available to the Warfighter 24/7 and added an additional course to meet combatant command and Warfighter training needs. We hosted a working group to analyze the effects of Contested, Degraded, and Operationally limited (CDO) operations on the ballistic missile defense system as well facilitated more operationally relevant BMDS tactics, techniques, and procedures. In just the past year, 18 JFCC IMD instructors provided 206 courses to more than 3,300 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.

Warfighter Capability 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 into the global BMDS.

Over the past year, we supported flight tests with the U.S. and Japan co-developed SM-3 Block IIA interceptor for Phase III of the EPAA architecture with two successful non-intercept flight tests and one successful intercept test. We have another intercept test planned for this year. Additionally, we have planned two THAAD flight tests involving engagement of intermediate- and medium- range ballistic missile targets, and three operational tests involving Patriot upgrades. For homeland defense capability, we provided Warfighter support in the January 2016 GMD Controlled Test Vehicle (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. This year, we will continue Warfighter support in the upcoming GBI flight test to validate interceptor improvement modifications. 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. That 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.

Conclusion

Mr. Chairman and Ranking Member Cooper, as a member of the Joint missile defense community, the Army continues to pursue enhancements to the Nation's integrated air and missile defense systems, from the strategic to the tactical levels. 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 an 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 allied 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 operational, doctrinal, and materiel developments are essential, our most important assets are the thousands of Soldiers, Sailors, Airmen, Marines, Civilians, and Contractors who deploy and operate our integrated air and missile defense systems. Additionally, as continuously highlighted by Department leadership, the strength behind our outstanding workforce is their Families. The contributions and sacrifices of the Families serves to greatly enable the dedication and performance of our workforce—the role and support of our Families empowers mission accomplishment.

I appreciate having the opportunity to address missile defense matters and look forward to addressing your questions.