

RECORD VERSION

**STATEMENT BY
LIEUTENANT GENERAL DANIEL L. KARBLER, USA
COMMANDING GENERAL,
U.S. ARMY SPACE AND MISSILE DEFENSE COMMAND
AND
COMMANDER,
JOINT FUNCTIONAL COMPONENT COMMAND FOR
INTEGRATED MISSILE DEFENSE**

BEFORE THE

**SUBCOMMITTEE ON STRATEGIC FORCES
COMMITTEE ON ARMED SERVICES
UNITED STATES HOUSE OF REPRESENTATIVES**

SECOND SESSION, 117TH CONGRESS

FISCAL YEAR 2023 AUTHORIZATION REQUEST FOR MISSILE DEFENSE

MAY 11, 2022

**NOT FOR PUBLICATION UNTIL RELEASED BY THE
COMMITTEE ON ARMED SERVICES**

Table of Contents

Introduction	1
People First	2
Recent Contributions and Upgrades to Army Space and Missile Defense Capabilities ..	3
U.S. Army Space and Missile Defense Command	4
Providing Forces and Capabilities for Current Operations	5
Support to Homeland Missile Defense	5
Support to Global Missile Defense Test and Development	6
Space Support to Missile Early Warning	6
Preparing Forces and Capabilities for the Future Fight.....	6
Research and Development of Army Technologies	7
Directed Energy.....	7
Tactical Space and High Altitude Technologies.....	8
Test and Evaluation.....	8
Hypersonic and Strategic Weapons	8
Missile Defense Testing Assets and Range	8
Army Contributions to the Nation’s Missile Defense Capabilities	9
Air and Missile Defense Readiness	10
Mission Command	10
Integrated Air and Missile Defense Battle Command System.....	10
Terminal High Altitude Area Defense System	11
Patriot/Patriot Advanced Capability-3 Missile Segment Enhancement	12
Lower Tier Air and Missile Defense Sensor	13
Indirect Fire Protection Capability	13
Army Long-Range Persistent Surveillance	13
Counter-Small Unmanned Aircraft Systems	14
Maneuver-Short Range Air Defense	14
Joint Functional Component Command for Integrated Missile Defense—	
Integrating and Synchronizing Missile Defense.....	15
Expansion and Integration of the Missile Defense Architecture	16
Integrated Missile Defense Asset Management.....	17
Cybersecurity of the Missile Defense System.....	17
Global Force Management	17
Allied and Partner Missile Defense Integration	17
Joint Missile Defense Training and Education	18
Warfighter Inputs to Capability Development.....	18
Comprehensive Missile Defeat	19
Conclusion	20

Introduction

Chairman Cooper, Ranking Member Lamborn, and distinguished Members of the Subcommittee, thank you for your continued support of our Service Members, Civilians, and Families and your continued support of the Army, U.S. Strategic Command (USSTRATCOM), U.S. Space Command (USSPACECOM), Department of Defense (DoD), and the space and missile defense community. Thank you also for inviting me to highlight the importance of space and missile defense capabilities and ongoing enhancements that enable the defense of our Nation, forward stationed and deployed forces, allies, and partners.

Today, with my assigned roles, I bring both an Army and a joint perspective on effective space and missile defense capabilities. Within the Army and joint communities, my responsibilities encompass several mission areas.

As commander of the U.S. Army Space and Missile Defense Command (USASMDC), I serve as the Army's force modernization proponent and operational integrator for space, missile defense, and high altitude capabilities. In short, USASMDC provides trained and ready space and missile defense forces and capabilities to the warfighter and Nation. With regard to missile defense, I am the Army Service Component Commander responsible for planning, integrating, coordinating, and providing Army missile defense forces and capabilities in support of USSTRATCOM missions. Additionally, I am a supporting commander to the Commander, U.S. Northern Command (USNORTHCOM), for the Ground-based Midcourse Defense (GMD) System. In the space mission area, I am the Army Service Component Commander to USSPACECOM, providing trained and ready Army space warfighters and capabilities to compete, fight, and win in the space domain.

As the Army's air and missile defense (AMD) enterprise integrator, I synchronize the balanced execution of the Army's AMD posture across the functions of force planning and sourcing requirements, combat and materiel development, AMD acquisition, and life cycle management. I coordinate with the AMD community of interest to balance priorities, inform resourcing decisions, and pursue innovative approaches in order to fulfill our AMD mission requirements.

Finally, as Commander of USSTRATCOM's Joint Functional Component Command for Integrated Missile Defense (JFCC IMD), I am responsible for providing operational-level global missile defense expertise in support of USSTRATCOM's Unified Command Plan (UCP)-assigned global missile defense operations support mission. In the missile defense arena, this includes plans integration, operations support, asset allocation recommendations, and support to missile defense capability development on behalf of combatant commanders (CCDRs). These efforts deter adversaries, assure allies, and defend U.S. deployed forces, allies, and partners against missile attacks.

The world has changed greatly since my testimony last year. We have witnessed the largest use of offensive missile systems in Europe since World War II in an unprovoked invasion of a sovereign nation by the Russian Federation in Ukraine. Like Russia, other potential adversaries globally are developing and fielding increasingly more diverse, robust, and lethal offensive missile systems in an attempt to gain coercive power and strategic advantage over the Nation and our allies and partners. It has never been more imperative that we deny them the benefits of using these weapons. We will accomplish this through continued investment and sustainment of combat ready, integrated, capable, and lethal AMD. Space capabilities, combined with our allies' and partners' abilities as part of a comprehensive approach to integrated deterrence, will also prove essential in ensuring our Nation's security.

People First

USASMDC and JFCC IMD, both comprised of multi-component Soldiers, Airmen, Sailors, Marines, Guardians, and dedicated Civilians and Contractors, cannot carry out our wide-ranging, no-fail national security missions without the commitment of our greatest asset—our people. We prioritize “People First” as we recruit, train, and develop Army space and missile defense professionals. Six values are embedded in our People First mandate: communication, recognition, trust, teamwork, transparency, and empowerment. Despite the many challenges introduced by the COVID-19 pandemic, our professionals continue to provide space and missile defense capabilities that support combatant command (CCMD) plans and operations. It is our people who make us strong; it is our people who make winning possible.

Recent Contributions and Upgrades to Army Space and Missile Defense Capabilities

The people of USASMDC and JFCC IMD continue to learn new ways to operate, accomplish our missions, enhance capabilities, and support global theaters. Throughout the last several months, we have realized essential space and missile defense operational, capability, and training successes, a few of which follow.

- We recently completed an upgrade of our Joint Tactical Ground Stations (JTAGS) configuration at our four theater missile warning company locations. This upgrade provided a significant improvement in our missile warning, missile defense cueing, and battlespace characterization capabilities in support of Multi-Domain Operations (MDO). It also enabled us to keep pace with rapidly growing, complex, and capable threat systems.
- In March 2022, the Army relocated two European-based Patriot missile defense batteries to Poland. This defensive relocation served to reinforce our Nation's commitment to Article 5 and proactively counter any potential threats to U.S. and allied forces in the eastern NATO region.
- During a March 2022 joint exercise, a subordinate air defense regiment under the European-based 10th Army Air and Missile Defense Command successfully deployed four Maneuver-Short Range Air Defense (M-SHORAD) Stryker-based platforms to the eastern NATO region. This deployment demonstrated the Army's newest short range air defense system's ability to defend maneuver forces against unmanned aerial systems (UAS), rotary-wing, and fixed-wing air threats.
- Our Army Space Training Division (ASTD) served as the lead proponent for equipping Army divisions and training centers with essential training aid devices that enable organizations to train in a degraded and disrupted space operations environment. With fielding completed, ASTD will lead future efforts on life cycle replacement of these devices.
- The USASMDC Technical Center leveraged commercial synthetic aperture radar imaging of current interest locations and, using artificial intelligence and machine learning algorithms, provided key operational data to tactical warfighting organizations.

- Support to significant testing and exercises remains a priority. Earlier this year, Air Defense Artillery (ADA) Soldiers participated in the Terminal High Altitude Area Defense (THAAD) Flight Test-21, where two Patriot Advanced Capability-3 (PAC-3) Missile Segment Enhanced (MSE) interceptors were integrated with THAAD software to successfully intercept a short range ballistic missile. This integration enables earlier interceptor launch and results in a longer fly-out time, which increases the defended area or battlespace. Our ADA Soldiers also recently participated in the initial operational test and evaluation of the successful Integrated Air and Missile Defense Battle Command System (IBCS) test. During this event, IBCS maintained continuous tracking of two cruise missile targets by fusing together data from multiple sensors while degraded by electronic attack. Finally, we continue to deploy Army space professionals to numerous joint and partner nation exercises and wargames.
- In addition to exercise support, operational deployments to CCMDs continue. Our 1st Space Brigade rotated an Army Space Control Crew to U.S. Indo-Pacific Command (USINDOPACOM), an Army Space Support Team to both U.S. Central Command (USCENTCOM) and U.S. European Command (USEUCOM), and Space Control Planning Teams to USEUCOM and USSPACECOM.
- Our Force Tracking Mission Management Center continues to support global operations in the USCENTCOM, U.S. Africa Command, and other CCMD geographic areas of responsibility. The Center provided vital management and dissemination of friendly force tracking data to theater commands.

U.S. Army Space and Missile Defense Command

To accomplish our vision of providing space, missile defense, and high-altitude forces and capabilities to support joint and combined warfighting readiness in all domains, USASMDC is organizationally aligned to accomplish three major tasks. These include: providing forces and capabilities for current operations; preparing forces and capabilities for the future fight; and researching and developing Army technologies to provide future advancements in space, air, and missile defense capabilities.

The command aligns its activities to these priorities:

- Accomplish our mission as a People First team of empowered, innovative, ready, and resilient professionals.
- Provide trained and ready forces for space, missile defense, and high-altitude missions.
- Conduct integrated planning and synchronized operations in the execution of our space and missile defense missions.
- Prepare for future conflict.

Providing Forces and Capabilities for Current Operations

In accordance with Title 10 responsibilities, USASMDC is a force provider of missile defense capabilities. Our first major task is to provide trained and ready missile defense forces and capabilities to CCDRs. USASMDC Soldiers serving in the homeland and in remote and austere forward-deployed locations operate the GMD and AN/TPY-2 Forward-Based Mode (FBM) radars. Highlights of the capabilities provided to current operations and readiness by our missile defense professionals include:

Support to Homeland Missile Defense: Soldiers from the 100th Missile Defense Brigade (MDB), headquartered in Colorado Springs, Colorado, and 49th Missile Defense Battalion, headquartered at Fort Greely, Alaska, stand ready to defend our Nation from intercontinental ballistic missile (ICBM) attack 24/7/365. In support of USNORTHCOM, Army National Guard and Active Component Soldiers operate the GMD Fire Control Systems located at the Fire Direction Center in Alaska; Missile Defense Element in Colorado; a detachment that oversees operations at Vandenberg Space Force Base, California; and a detachment that secures GMD sensor infrastructure at Fort Drum, New York. At the Fort Greely Missile Defense Complex, 49th Missile Defense Battalion military police secure interceptors and command and control (C2) facilities from physical threats. These security Soldiers perform their duties in some of the most austere conditions in the United States, with winter temperatures plummeting to 50 degrees below zero and fewer than 4 hours of sunlight in the winter months.

1st Space Brigade Soldiers provide CCDRs certified AN/TPY-2 FBM missile defense batteries that support strategic and regional missions. These batteries are

globally located in five strategic, yet remote and austere locations, where they provide ballistic missile search, track, and discrimination operations in support of both homeland and regional defense. These Soldiers continuously demonstrate our Nation's commitment to defend deployed forces, allies, and partners from ballistic missile attacks.

Support to Global Missile Defense Test and Development: Soldiers from the 100th MDB and 49th Missile Defense Battalion participate in GMD test activities and work with Missile Defense Agency (MDA) developers on enhancements to the GMD. The MDA's testing regime, conducted through a series of ground-based and operational flight tests, emphasizes operational realism during test design and execution. This realism enables system operators to sustain and improve their proficiency and validate the system's operational employment.

Space Support to Missile Early Warning: Space-enabled capabilities are essential for missile defense operations. They provide and enable communications; positioning, navigation, and timing (PNT); intelligence; and surveillance to meet the demands of modern warfare. In support of joint force commanders, USASMDC continues to provide missile warning within the USEUCOM, USCENTCOM, and USINDOPACOM theaters of operations. The 1st Space Brigade's forward stationed JTAGS theater missile warning companies are essential for USSPACECOM's assured missile warning mission. They are operated by USASMDC Soldiers who monitor launch activity and other events observed by infrared sensor platforms and quickly provide information to members of the AMD and operational communities. The JTAGS forward stationing reduces the risk of solely relying on long-haul communications and ensures the resilience of USSPACECOM's comprehensive missile warning system.

Preparing Forces and Capabilities for the Future Fight

USASMDC's second major task is to develop future missile defense forces and mature current capabilities. The Space and Missile Defense Center of Excellence (SMD CoE) is the Army's force modernization proponent responsible for managing change to Army doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy (DOTMLPF-P) requirements for space, strategic missile defense, and high-altitude capabilities. The SMD CoE trains and educates agile, adaptive, and

ready Soldiers and leaders; executes life cycle management for Army space operations officers; develops Army Space Soldiers; and enables informed decision making.

To carry out its mission, the SMD CoE executes practices established by U.S. Army Training and Doctrine Command and Army Futures Command to meet force management and Army modernization enterprise responsibilities. These functions include performing concept development, capabilities determination, and capabilities integration relative to DOTMLPF-P for process change, integration, and transition for materiel development.

Specifically, in the training arena, SMD CoE conducts the Army's institutional Soldier qualification training and education for space and GMD mission areas. The SMD School writes, coordinates, and publishes Army doctrine for space and GMD while also integrating space training and education in curriculum across all Army proponent schools, operational unit home stations, and pre-deployment training events. These efforts prepare Soldiers across all warfighting functions to integrate Army and joint space and missile defense capabilities and effects in the conduct of MDO.

Research and Development of Army Technologies

USASMDC's third major task is to provide critical technologies to address future needs that will enhance warfighter effectiveness. USASMDC's Technical Center supports joint warfighters by providing science, technology, and test and evaluation expertise to enable warfighter dominance both today and in the future. The Technical Center contributes to warfighter and joint force success in four major areas: directed energy (DE); tactical responsive space and high altitude; test and evaluation; and hypersonic and strategic weapons.

Directed Energy: The Technical Center is the Army lead for high-energy laser technology development. High-energy lasers complement kinetic systems in addressing rocket, artillery, and mortar threats; UAS; and cruise missiles. Additionally, the Technical Center is exploring high-power microwave technology for use in interdicting a multitude of improvised threats. As systems are fielded, the Technical Center will continue developing new and improved DE technologies for insertion into weapon systems to maintain warfighter dominance.

Tactical Responsive Space and High Altitude: As the Army lead for space and high-altitude research, development, and engineering, the Technical Center identifies, develops, demonstrates, and integrates technologies in the areas of responsive space, space superiority, and high altitude. Working with other Army, DoD, and industry partners, the Technical Center focuses on persistent beyond line-of-sight communications for forces in remote areas; functionally effective resolution imagery; solutions for assured PNT; ground C2 systems; and direct downlink of tactical data feeds.

Test and Evaluation: As an invaluable part of the Army test and evaluation enterprise, the Technical Center supports developmental and operational AMD defense testing with a suite of low-cost ballistic missile targets, transportable and configurable launchers, and test execution and evaluation. These ballistic missile targets are critical to threat-representative, operationally realistic testing of high-priority Army systems such as Patriot, THAAD, and IBCS, with future testing planned for the Lower Tier Air and Missile Defense Sensor (LTAMDS).

Hypersonic and Strategic Weapons: Since completing the Nation's first successful hypersonic weapon test in 2011, the Technical Center has continued supporting hypersonic testing for the Army, Navy, and Air Force, from test planning and design through mission execution and post-flight analysis. Additionally, the Technical Center is continuing to develop capabilities that enable rapid systems development and fielding through integration and interoperability testing, sensor and C2 design, flight test analysis, verification and validation, and warfighter training within an independent laboratory infrastructure.

Missile Defense Testing Assets and Range: The Technical Center also oversees the Ronald Reagan Ballistic Missile Test Site (RTS) at U.S. Army Garrison-Kwajalein Atoll, Republic of the Marshall Islands. The RTS is a vital national asset that provides live-fire developmental and operational flight testing of offensive and defensive missile, hypersonic, and space systems; equatorial satellite launch capability; space object tracking and characterization; and atmospheric science research. This unique range and test facility, located 2,300 miles west-southwest of Hawaii, provides test support to MDA, NASA, the U.S. Air Force, and other agencies.

The RTS supports developmental and operational testing of both homeland and regional missile defense systems, as well offensive ballistic missile testing for the Air Force Global Strike Command. Hypersonic system testing has become a significant element of near-term test planning at RTS. In concert with its testing mission and using a suite of the world's most sophisticated radar systems, to include the U.S. Space Force's Space Fence, RTS also supports space object identification and space domain awareness missions in support of USSPACECOM. This mission includes space object tracking and characterization, providing critical orbital information on new foreign launches and high-resolution images in support of space situational awareness.

Army Contributions to the Nation's Missile Defense Capabilities

The DoD will adopt a new strategic course in 2022, with a new National Security Strategy, National Defense Strategy, Nuclear Posture Review, and Missile Defense Review. The Army will establish its corresponding strategy nested in Office of the Secretary of Defense (OSD) guidance. USASMDC will update the Army Air and Missile Defense 2028 vision document to meet these directives and enable MDO. To achieve an AMD force capable of supporting the Army of 2030, we must continue modernizing and developing AMD capabilities, building sufficient AMD capacity for MDO, and ensuring AMD forces are trained and ready. We must also ensure that our capabilities and associated C2 systems are resilient and interoperable with joint and allied forces. Accomplishing these essential tasks will allow us to provide deterrence through deployments and forward stationing and enable a more robust, comprehensive defense by coordinating and integrating with our allies and partners.

Army AMD is undergoing its most significant modernization program in the last four decades, as it is one of the Army's six modernization priorities receiving substantially increased investment. The AMD Cross Functional Team (CFT) serves as the Army's modernization lead and works closely with the other Services, Joint Staff, and MDA toward joint integrated AMD (IAMD) capabilities. The Program Executive Office Missiles and Space is the Army's materiel developer for these capabilities and works closely with AMD CFT and U.S. Army Aviation and Missile Command. A summary of the Army's AMD strategic direction and major programs follows.

Air and Missile Defense Readiness: Multiple factors—including the enduring demand from CCDRs, the transition to great power competition and its associated complex threat set, and the overdue and critical need to modernize the Army’s AMD force—have all converged to impact Army AMD force readiness. High operational demand of missile defense forces to support joint warfighters continues stressing Army AMD force readiness, modernization, and Soldier welfare. Enduring high operational tempo and limited deployment predictability negatively impact Soldier readiness and family well-being. Currently, twice as many ADA Soldiers are dwell restricted as compared to the overall Army. In an effort to improve Soldier predictability and readiness, the Army has established a new unit life cycle modernization model known as the Regionally Aligned Readiness and Modernization Model (ReARMM). It is critical that the ADA Branch leverage ReARMM to inform the Joint Staff and OSD on force availability and improve deployment predictability for AMD Soldiers.

Mission Command: Closely linked to AMD readiness is the ability to provide low density, high demand AMD mission command elements. These elements are pivotal to laying the foundation for and creating an environment that supports integration of Army AMD forces into joint and combined C2 architectures. During the past few years, the Army has activated an additional active component ADA brigade headquarters in USINDOPACOM and rotated a National Guard ADA brigade headquarters to USEUCOM. Also in the USEUCOM theater, the Army will soon stand up an active component ADA brigade headquarters.

Integrated Air and Missile Defense Battle Command System: The IBCS program is a top Army AMD modernization priority that integrates current and future AMD sensors and weapons into a common integrated fire control capability, allowing warfighters to fully integrate AMD capabilities across all echelons. The IBCS is the direct replacement for mission command nodes in the Patriot weapon system, headquarters elements, and airspace management cells. It also allows rapid convergence of sensors, shooters, and mission command components on an integrated fire control network. Once fully fielded, IBCS will provide a game-changing capability that allows appropriate tailoring and scaling of AMD forces to meet the given threat. The quantity and mix of capabilities can be dynamically retasked into a formation with an

inherent, integrated mission command system to build tiered and layered defenses. In addition, IBCS open architecture enables rapid integration of legacy and developmental sensors and shooters that provide capabilities to defeat emerging threats in MDO. This year, the IBCS program entered low-rate initial production and began initial operational testing and evaluation.

The IBCS program will field common mission command nodes for Army AMD forces to defend against manned aircraft, UAS, air-to-ground missiles, tactical ballistic missiles, cruise missiles, and rockets, artillery, and mortar (RAM) attacks. Ultimately, IBCS will operate with air surveillance and fire control capabilities across the Army, Air Force, and Navy, and with joint and multinational AMD forces at all echelons, thereby enhancing AMD force lethality. By dismantling the current system-centric mission command paradigm, it will dramatically increase systems capability and facilitate open industry competition in support of the AMD community. The IBCS is one of the Army's contributions to Combined Joint All Domain Command and Control, currently in development between the Army and Air Force; continued experimentation to link with C2 systems for Army and joint fires is ongoing. Additional efforts are currently underway to support IBCS interoperability with MDA's Ballistic Missile Defense System, exploring the feasibility and potential benefits of integrating IBCS with MDA's Command and Control, Battle Management, and Communications (C2BMC) program.

Terminal High Altitude Area Defense System: THAAD is a key component of the ballistic missile defense system-of-systems architecture and designed for area defense against short, medium, and intermediate range ballistic missiles. It is a mobile and globally transportable, low density, high demand asset that has a unique endo- and exoatmospheric intercept capability using proven hit-to-kill technology. There are currently seven operational THAAD batteries, two of which are forward stationed in Guam and the Republic of Korea in response to the North Korean nuclear and missile threat. Development efforts associated with U.S. Forces Korea Joint Emergent Operational Need (JUONS) improved Patriot and THAAD interoperability, as successfully demonstrated in a recent THAAD/Patriot MSE developmental and operational test where THAAD software used two MSE interceptors to engage a ballistic

missile target. As directed in the 2019 Missile Defense Review, the Army, in conjunction with OSD and MDA, reassessed the THAAD requirement to eight batteries.

Patriot/Patriot Advanced Capability-3 Missile Segment Enhancement: The Army Patriot force remains the cornerstone of AMD protection for our deployed forces, friends, and allies. The PAC-3 MSE is a high velocity, hit-to-kill, surface-to-air missile capable of intercepting and destroying tactical ballistic missiles and air-breathing threats. The PAC-3 MSE, a follow-on variant of the PAC-3, is in full-rate production and the latest generation hit-to-kill PAC-3 interceptor in the Patriot force to meet global capability requirements. The PAC-3 MSE fills the engagement gap between THAAD and PAC-3 missiles while also defeating advanced threats earlier, at greater range, and with increased lethality. The PAC-3 MSE's improved capability is achieved through a higher performance solid rocket motor, modified lethality enhancer, more responsive control surfaces, upgraded guidance software, and insensitive munitions improvements.

Patriot must continually modernize through software and hardware upgrades to address obsolescence and evolving threats, and to best utilize extended battlespace performance afforded by the PAC-3 MSE interceptor. Modernization efforts provide combat identification enhancements, address upper-tier debris mitigation, improve PAC-3 MSE interceptor performance, and enable increased Army and joint interoperability. The Army leverages the program's stable funding profile to reduce price risk to the government through firm fixed price contracting and value engineering initiatives. In doing so, the Army mitigates obsolescence and counters emerging threats through hardware and software improvements. In addition to the integration efforts with the LTAMDS radar and IBCS, the Army supports the MDA-led integration of PAC-3 MSE interceptors and launchers into the THAAD weapon system. These new integrated capabilities expand battlespace by leveraging the THAAD AN/TPY-2 and Patriot radars together to detect threat targets at greater ranges. They will be pure fleeted across all Patriot battalions beginning in Fiscal Year 2023. In addition, to overmatch the near-term evolving threat, the Army is continuously improving Patriot while moving toward an IBCS architecture that enables kill-chain contributions from a wider spectrum of Army and joint sensors and weapon components.

Lower Tier Air and Missile Defense Sensor: Replacing the current Patriot radar, LTAMDS will provide networked sensing capabilities in lower tier missile defense battlespace and enable full capability of the PAC-3 MSE. The LTAMDS significantly improves legacy Patriot radar by providing expanded range and 360-degree coverage combined with the benefits of a networked sensor on the Army IAMD integrated fire control network. This modern technology will reduce current Patriot radar operations and sustainment costs by offsetting system equipment requirements and enhancing reliability and maintainability. Recent program successes include approval of an updated acquisition strategy that enables rapid prototyping and major capability acquisition, as well as approval of the LTAMDS PNT strategy. The Army plans to begin testing LTAMDS prototypes with IBCS and the Patriot family of interceptors, with the objective of fielding four sensors under urgent materiel release to a Patriot battalion by the end of 2023.

Indirect Fire Protection Capability: Indirect Fire Protection Capability (IFPC) is a ground-based weapon system designed to acquire, track, engage, and defeat cruise missile, UAS, and RAM threats. The Army's IFPC must integrate with IBCS as its C2 to enable an MDO-ready Army by 2030. In accordance with the Fiscal Year 2019 National Defense Authorization Act, the Army completed acceptance and fielding of two Iron Dome system batteries as an interim cruise missile defense capability. This past February, the Army supported Operation Iron Island, an Army executive order requirement that served as an opportunity to gain awareness of the system in an operational environment.

The Army is currently executing a competitive acquisition strategy to develop and field an enduring IFPC capability integrated with IBCS. IFPC Increment 2 will be an industry built solution for a launcher, and interceptor, and an all-up-round-magazine. This weapon platform will integrate with IBCS fire control with Sentinel as the primary organic sensor. In September 2021, the Army announced the award of a rapid prototype agreement with an industry partner for development and delivery of 16 launchers and 60 interceptors for IFPC Increment 2.

Army Long-Range Persistent Surveillance: The Army Long Range Persistent Surveillance (ALPS) passive sensor provides continuous, 360 degree, long range

surveillance against fixed- and rotary-wing aircraft, UAS, and cruise missile threats and has demonstrated the ability to integrate into joint and Army C2 systems, including IBCS. In response to multiple CCDR requirements, ALPS completed a USCENTCOM deployment last year and is currently being fielded in the USEUCOM and USINDOPACOM theaters.

Counter-Small Unmanned Aircraft Systems: Technological advances and the proliferation of commercial and tactical UAS in both reconnaissance and attack capabilities have matured to the point where they present a significant threat to Army operations from both state and nonstate actors. To address these threats, the Army continues to serve, at the direction of the Secretary of Defense, as the executive agent for countering UASs, having established the Joint Counter-Small UAS (C-sUAS) Office (JCO). Key JCO focus areas include developing joint requirements and materiel solutions, as well as joint training and doctrine. The JCO continues to work across DoD to synchronize and coordinate the development of C-sUAS technologies that meet Service-specific and joint requirements. Development efforts such as high-power microwave and DE are critical to ensuring the Army maintains pace with both commercial and state developed UASs. In response to a warfighter JUONS, the Army recently deployed over 500 man portable, fixed site, and mobile C-sUAS systems and continues adapting to changing theater UAS threats. The Army is now focused on providing critical C-sUAS capabilities to divisions in the operational force while growing protection of vital fixed and semi-fixed sites. For instance, in support of the Immediate Response Force in Europe, the Army has provided the 82nd Airborne Division kinetic and non-kinetic C-sUAS capabilities, allowing the division to detect, track, and defeat sUAS.

Maneuver-Short Range Air Defense: In response to identified operational needs, M-SHORAD will provide maneuver forces a dedicated, Stryker-based air defense capability against fixed-wing, rotary-wing, and UAS threats. In Fiscal Year 2018, the Army approved and began developing initial M-SHORAD systems that integrate existing Army capabilities into Stryker combat vehicles. The program successfully delivered four first unit equipped systems to an artillery regiment in April 2021 and remains on track to deliver four M-SHORAD battalions by Fiscal Year 2024. The Army also continues

maturing high energy laser and electronic warfare technologies to increase M-SHORAD capabilities in support of the maneuver force. Ultimately, M-SHORAD battalions will contain a mix of complementary DE and kinetic intercept systems to protect the maneuver force.

Joint Functional Component Command for Integrated Missile Defense— Integrating and Synchronizing Missile Defense

The Joint Functional Component Command for Integrated Missile Defense (JFCC IMD) is USSTRATCOM's integrating element for global missile defense. USSTRATCOM formed JFCC IMD to execute its UCP-assigned missile defense responsibilities, enabling the headquarters to focus on integration and advocacy. Established in 2005 and headquartered at Schriever Space Force Base, Colorado Springs, Colorado, JFCC IMD is manned by a cohesive team of subject matter experts from the Army, Navy, Air Force, Space Force, and Marine Corps, as well as Government Civilian and Contractor personnel.

The JFCC IMD is the recognized subject matter expert across the missile defense enterprise in matters of global missile defense operational support, policy, plans, intelligence, communications, training and education, and operational risk assessment. The command's principal mission is to integrate these transregional missile defense functions across the joint and combined warfighting force. On behalf of USSTRATCOM and other CCDRs, JFCC IMD champions warfighter priorities and operational needs. These include continued development of a robust missile defense sensor network, integrated discrimination capabilities, redundant and resilient C2 networks with enhanced cybersecurity defenses, and improved means of intercept for all missile and hybrid threats.

The JFCC IMD works across DoD and alongside allies and key partners to improve integration of existing capabilities, maximizing efficiency and effectiveness in global missile defense missions. Integration is the essential force multiplier—a critically important mission enabler that JFCC IMD directly supports. As a functional component command of USSTRATCOM, JFCC IMD supports designated UCP responsibilities along four lines of effort:

- Synchronizing global missile defense planning, global force management, and missile defense security cooperation activities.
- Conducting global missile defense operations support, to include asset management, alternate execution authority, federated intelligence support, and network monitoring and protection.
- Executing above element, joint, and combined global missile defense training and education, exercises, and experimentation.
- Advocating for, and recommending acceptance of, global missile defense capabilities, conducting analyses and assessments of current and future capabilities, and supporting tests.

To accomplish these efforts, JFCC IMD maintains close collaborative relationships with CCDRs, MDA, OSD, the Joint Staff, Services, intelligence community, and our allies and partners. The JFCC IMD continually seeks to enhance deployed forces' capabilities while gaining operational experience and confidence in our collective ability to defend the Nation, deployed forces, allies, and partners. Some key efforts to enhance missile defense planning and capabilities for both homeland and regional architectures follow.

Expansion and Integration of the Missile Defense Architecture: In response to the evolving strategic environment, JFCC IMD continues to bolster homeland and regional missile defense capabilities and further the global missile defense mission through advancement of new capabilities. These advancements include the Aegis Ashore site in Poland; continued development of the Standard Missile-3 Block IIA; the Long Range Discrimination Radar, Clear Space Force Station, Alaska; Space-based Kill Assessment; MDA's Hypersonic and Ballistic Tracking Space Sensor; Space Development Agency's Tranche 1 Tracking Layer; the Next Generation Interceptor for homeland defense; and the Glide Phase Interceptor for regional hypersonic defense. Given the challenges associated with integrating these capabilities into a global architecture, JFCC IMD, in support of USSTRATCOM, provides essential collaboration with CCDRs to assess and address transregional gaps in the areas of planning, policy, capabilities development, and operations.

Integrated Missile Defense Asset Management: The JFCC IMD, in coordination with USSTRATCOM and CCDRs, manages missile defense operational readiness posture, coordinates global missile defense system maintenance, and supports MDA and Service tests. The asset management process allows JFCC IMD to continually assess system readiness to defend against missile attacks and recommend adjustments to optimize overall missile defense architecture.

Cybersecurity of the Missile Defense System: The JFCC IMD, in coordination with USSTRATCOM and MDA, conducts the cybersecurity service provider mission for missile defense architecture to ensure cyber defenses and operations are planned and executed across the globe. Working with key stakeholders, JFCC IMD enhances the cyber defense posture of the missile defense operational architecture against malicious activity. The JFCC IMD also collaborates with mission partners to incorporate realistic cybersecurity testing in support of the warfighter capability acceptance process. Additionally, JFCC IMD works closely with the Joint Staff, CCMDs, and MDA to educate, train, and exercise cybersecurity protocols to ensure the highest levels of global missile defense readiness.

Global Force Management: USSTRATCOM, as the designated Joint Functional Manager for Missile Defense, relies upon JFCC IMD to evaluate and recommend to the Joint Staff risk-informed sourcing of missile defense requirements. Due to the low density and high demand nature of missile defense assets, all sourcing decisions have a direct and significant impact on other CCDRs' campaign and contingency plans. The JFCC IMD continues refining this approach, ensuring integrated capabilities are appropriately postured to counter transregional threats in accordance with the current National Defense Strategy, Missile Defense Review, and Department steady-state priorities. This globally integrated approach serves as the baseline for risk-based recommendations to the global force management process, enabling senior leaders to make informed decisions.

Allied and Partner Missile Defense Integration: Given that we will never have enough active defense capacity, integrating our allies and partners into a common and mutually supportive architecture is a critical warfighter priority. We must move beyond merely enabling the independent "burden sharing" of allies and partners to an

environment of mutual trust and information sharing that empowers truly integrated planning and operations enabled by combined force development, simulation, experimentation, testing, and exercise. We must acknowledge that future major conflicts should not be fought alone and that our greatest strategic advantage is the power of our alliances and partnerships. We should not hamstring this historic advantage with continued policies and practices that hinder collective action.

The Nimble Titan Campaign of Experimentation, a biennial series of multinational missile defense experiments, is one venue aimed at promoting this increased cooperation. This event brings together subject matter experts from allied and partner nations to explore the national policy and military interfaces and dynamics involved in collaborative coalition and alliance missile defense planning. Meeting this intent is necessary to developing regional defense designs, C2 relationships, and collective, bilateral, and multilateral policy. Nimble Titan fosters greater confidence in combined missile defenses and provides a means to advance U.S. efforts in collaboration, interoperability, and operational integration with our allies and partners.

Joint Missile Defense Training and Education: Even with ongoing challenges posed by COVID-19, JFCC IMD, in coordination with USSTRATCOM, the Joint Staff, Services, and CCMDs, continues developing comprehensive and innovative training programs to close gaps between Service, joint, and regional missile defense training and education. The JFCC IMD's Joint Ballistic Missile Defense Training and Education Center offers 18 mission-focused resident, online, and mobile training team courses including orientation, asset management, C2BMC situational awareness, and general and flag officer seminar training. During 2021, JFCC IMD instructors executed 169 courses that trained more than 4,100 students worldwide. Enhancing collective advantage, JFCC IMD also provides training courses to allies and partners through both military to military and Foreign Military Sales training venues. Additional foreign training opportunities are anticipated as the COVID-19 pandemic wanes globally.

Warfighter Inputs to Capability Development: The JFCC IMD helps streamline and accelerate MDA's efforts to provide integrated kill chain capabilities (sense, C2, and effect) to warfighters as quickly as possible to meet increased threat developments. As multiple reviews have identified, the Nation must streamline requirement generation and

reform acquisition and fiscal processes and cultures to enable MDA and the Services to quickly develop, test, and deliver effective, reliable, and sustainable missile defense capabilities. Our adversaries are not waiting, so we must change our typical ways with innovation, adaptability, risk acceptance, and speed. The JFCC IMD collaborates with CCDRs, MDA, and the Services, as well as their respective test agencies, to leverage emerging technologies to enhance existing systems, explore innovative operational concepts, and prioritize maturing technological advancements with the most promising near-term potential. To that end, JFCC IMD continues optimizing the collaboration inherent in the warfighter involvement process as an operational proponent for required missile defense capabilities and performance enhancements.

Sustaining our competitive advantage through innovation and expedience depends on well-resourced and operationally relevant test campaigns, as well as high fidelity modeling and simulation infrastructure and forward looking wargaming to challenge assumptions regarding our future missile defense readiness and posture. In testing over the past year, JFCC IMD supported demonstration of the selectable 2- and 3-stage GMD interceptor, which will improve the effective engagement and defeat zone of incoming threats; several data collections of hypersonic vehicle flight tests to characterize sensor performance; and test planning for an upcoming operational flight test to demonstrate the Long Range Discrimination Radar's capabilities.

Comprehensive Missile Defeat: As I have highlighted, adversary offensive missile and hybrid systems are increasingly complex and challenging in their delivery means and scale. As such, an optimal missile defense requires both defensive and offensive capabilities to defeat potential threats. By sustaining a capability to not only attack the adversary's ability to launch missiles but also destroy them after launch, a comprehensive approach can lower overall costs and reduce risk of failure. Creating this comprehensive posture—involving the integration of both defensive and offensive capabilities - will require balancing a variety of approaches within our capability set.

Importantly, as we continue developing innovative capabilities, it is imperative that we implement integrated deterrence as the framework that weaves together all instruments of national power. These actions include diplomacy at the forefront and advancing cross-domain deterrence together with the capabilities and actions of allies

and partners to ensure the costs and risks of adversary aggression remain disproportionate to any conceivable benefit. These capabilities must include conventional kinetic, DE, cyber, and electromagnetic attack as part of a comprehensive approach. Each individual approach provides opportunities to reduce the burden on active defenses; however, none alone is a “silver bullet” to defeating the threat. As such, our future offensive materiel solutions will likely be a mix of guns, missiles, electronic warfare, cyber, space, and DE weapons. To this end, we must understand how each of these systems complement one another and strive for a balance that allows prelaunch attack operations and offense-defense integration, and then organize to operationalize these capabilities and maximize their contributions to missile defense.

In summary, JFCC IMD continues to expand our Nation’s global missile defense architecture and explore developing capabilities to maintain operational advantage against current and future threats. We maintain our competitive edge through integrated planning and operational support, development of warfighters through education and training, expansion of collective capabilities in collaboration with our allies and partners, and rapid delivery of innovative and impactful capabilities to warfighters that enhance national security.

Conclusion

Chairman Cooper and Ranking Member Lamborn, as members of the joint missile defense community, the Army and USSTRATCOM continue pursuing enhancements to the Nation’s IAMD systems, from tactical to strategic levels of warfare. As outlined here, USASMDC and JFCC IMD perform a broad set of critical national security missions. These missions include providing professional warfighters and capabilities to support current operations, ensuring they are prepared for tomorrow’s fight, and developing the new technologies required to achieve and maintain technological advantage against our adversaries. Our trained and ready Soldiers, operating GMD elements in Colorado, Alaska, New York, and California, and from remote, globally deployed locations, remain ready to defend the homeland against ICBM attack. As a force provider to CCDRs, we provide essential regional sensor capabilities, ballistic missile early warning, and space-enabled communications. Our regional forces continue to leverage allied collaboration and planning efforts in

developing integrated and interoperable defenses against various threat sets. USSTRATCOM, through JFCC IMD, continues to integrate missile defense capabilities to counter global missile threats and protect our Nation, deployed forces, and allies and partners.

While operational, doctrinal, and materiel developments are essential, our most important assets are the thousands of Soldiers, Sailors, Airmen, Marines, Guardians, Civilians, and Contractors who deploy and employ our IAMD systems. As recognized by Department leadership, the strength behind our outstanding workforce is their families. Their contributions and sacrifices are foundational to the dedication and performance of our workforce—the role and support of our families empowers mission accomplishment.

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