S. HRG. 119–75, PT. 7

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2026 AND THE FUTURE YEARS DEFENSE PROGRAM

HEARING

BEFORE THE

COMMITTEE ON ARMED SERVICES
UNITED STATES SENATE

ONE HUNDRED NINETEENTH CONGRESS

FIRST SESSION

ON

S. 2296

TO AUTHORIZE APPROPRIATIONS FOR FISCAL YEAR 2026 FOR MILITARY ACTIVITIES OF THE DEPARTMENT OF DEFENSE, FOR MILITARY CONSTRUCTION, AND FOR DEFENSE ACTIVITIES OF THE DEPARTMENT OF ENERGY, TO PRESCRIBE MILITARY PERSONNEL STRENGTHS FOR SUCH FISCAL YEAR, AND FOR OTHER PURPOSES

PART 7
STRATEGIC FORCES

MARCH 26; MAY 13, 20, 2025

Printed for the use of the Committee on Armed Services

THE DEPARTMENT OF DEFENSE SPACE ACTIVITIES IN REVIEW OF THE DEFENSE AUTHORIZATION REQUEST FOR FISCAL YEAR 2026 AND THE FUTURE YEARS DEFENSE PROGRAM—PART 7 STRATEGIC FORCES

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CONTENTS

MARCH 26, 2025

MAY 13, 2025

MAY 20, 2025

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2026 AND THE FUTURE YEARS DEFENSE PROGRAM

WEDNESDAY, MARCH 26, 2025

UNITED STATES SENATE,
SUBCOMMITTEE ON STRATEGIC FORCES,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

UNITED STATES STRATEGIC COMMAND AND UNITED STATES SPACE COMMAND

The Subcommittee met, pursuant to notice, at 9:30 a.m., in room SD–106, Dirksen Senate Office Building, Senator Deb Fischer (Chairman of the Subcommittee) presiding.

Committee Members present: Fischer, Cotton, Wicker, Rounds, Tuberville, Banks, King, Reed, and Kelly.

OPENING STATEMENT OF SENATOR DEB FISCHER

Senator FISCHER. The hearing will come to order. Good morning, everyone.

The Strategic Forces Subcommittee meets today to receive testimony on the posture of the United States Strategic Command and the United States Space Command. I want to begin by thanking our witnesses, General Cotton from COM, and General Whiting from SPACECOM.

General Cotton, this is likely one of the last times you will be speaking before our Committee. You have always been open and forthright with this Committee, and I want to thank you for your service and dedication as you approach your final year as Commander of STRATCOM.

Today we face a threat environment more dangerous than we have seen since the Second World War. For the first time in history, the United States faces two adversary nuclear powers, in Russia and China. Russia has nearly completed modernizing its nuclear triad, and continues to expand and improve their tactical nuclear forces. China, meanwhile, which used to be considered a lesser-included case, is expanding its own arsenal at a breathtaking pace. China now has more ICBM launchers than the United States, and is expected at least to triple its stockpile by 2035. I would also note that China has outpaced every previous estimate that we have made.

General Cotton, as you well know, this is an extremely important time for STRATCOM. Each leg of our triad is undergoing a generational modernization. This includes the *Columbia*-class submarine to replace the *Ohio*-class; the B–21 bomber to replace the B–1 and B–2 bombers; and the Sentinel ICBM, to replace the Minuteman III.

Given the ages of the legacy programs, it is essential that these modernization efforts be prioritized and properly resourced to ensure we have capabilities fielded in time to meet the growing threat. While it is the responsibility of the services to get these programs back on schedule, it is STRATCOM who must mitigate risks associated with any delays. I look forward to hearing more in the closed session about your plans to do so.

Additionally, the nuclear-armed sea-launched cruise missile, or SLCM, remains a critical program to deter our adversaries from believing they can use tactical nuclear weapons. I look forward to hearing from you, General Cotton, on your work with the Navy on SLCM.

I would be remiss if I did not also underscore the importance of NC3, what Senator King and I refer to as the fourth leg of the triad. NC3 underpins all aspects of nuclear deterrence. General Cotton, I appreciate the focus that you have given NC3 modernization during your time in command, and I will be eager to receive an update on the implementation of the NC3 roadmap.

General Whiting, the space domain is now, as you point out in your opening statement, a highly contested strategic environment. China and Russia possess growing counter-space capabilities that hold United States space assets at risk. Russia is developing the capability to place a nuclear weapon on orbit, while China is investing in maneuverable satellites that could target our satellites. These are just the threats that we can discuss in this open setting.

While I look forward to a more robust discussion on how we need to address these threats in a classified session, I am eager to hear from you during this open session on your priorities for fiscal year 2026, and how we can leverage emerging technologies to field more dynamic space-based systems. I am also eager to hear an update on how SPACECOM is working with the other combatant commands, the services, and the intelligence community to ensure that we are developing the right capabilities, sharing information with warfighters in real time, and that the services and interagency partners are integrated appropriately.

I will make one final point before I turn it over to Senator King for his opening statement. Both of your combatant commands rely on access to critical electromagnetic spectrum to carry out your missions. As we know, there are efforts underway to force DOD to vacate portions of those spectrum bands. Such an outcome would be detrimental to U.S. national security and result in significant costs, as various DOD equities are forced to invest the resources to redesign, procure, and field new systems to operate in different spectrum bands, if that is even feasible.

General Whiting and General Cotton, I look forward to hearing from both of you on the importance of spectrum to your missions. Before any decisions are made on whether to auction off DOD spec-

trum, the American people deserve to understand the risks there would be to national security.

Again, thank you both for appearing before us today. I look forward to hearing your testimony.

Senator King, you are recognized.

STATEMENT OF SENATOR ANGUS S. KING, JR.

Senator KING. Thank you, Senator Fischer. I want to first thank both of you for your service and for the incredible work that you have done, both in managing the assets that are in your purview but also in thinking about how to move forward.

This is a posture hearing. It is really a status report. It is a combination of a status report, where are we now but where do we need to be, and what do we need in the way of resources in order to get there.

General Cotton, deterrence is the keystone of our entire defense strategy. We often forget that. We get lost in counting tanks or airplanes or Navy ships. But the whole idea of all of these resources is that they never be used, that they be such a terrifying prospect for a potential adversary that they will never be used. And in fact, deterrence had worked in the nuclear area for 75, 80 years. So that is really what we need to talk about today.

Modernization the triad, which we are in the middle of right now, is an expensive proposition. But to shortchange that process, in my view, would be disastrously short-sighted. So I hope to hear where we are on modernization with parts of the triad, but also where we need to be, what necessary authorities there are that we need to be talking about, and also necessary funding. I refer to nuclear modernization as the pig in the budgetary python. It is, unfortunately, just by history, we are having to do all three legs at once, and that is a very expensive proposition, but it is something that we have to do in order to maintain the deterrence strategy that has protected this country for so long.

In terms of the space assets, of course, it is no news to anybody that space was an uncontested domain 20 years ago. Ten years ago, it began to be contested, and today it is highly contested. So, General, we have really got to be understanding the status, where we are, particularly when we are talking about a potential conflict with China, which would involve the vast expanse of the Pacific Ocean and naval power, and how that will be subject to space assets and how we can protect ourselves in a time of potential conflict. Of course, we all hope that conflict can be avoided. That brings me back to deterrence.

So I think the important message that I have is that decisions we make here today, and over the next 6 months, will have profound impacts in the future. And that is what is so important about what we are talking about today. I can think of no two more important people right now in thinking about how to posture this country in order to maintain deterrence and the security of the American people.

So I thank you for being here, I look forward to your questions, and now I think it is time to turn it over to the Chair.

Senator FISCHER. Thank you, Senator King. We are joined today by Chairman Wicker and Ranking Member Reed, and I would ask

each of them to give an opening statement if they so desire at this time. Chairman Wicker.

STATEMENT OF SENATOR ROGER WICKER

Chairman WICKER. Thank you, Madam Chair, and I want to thank the Chair and Senator King for working together as a team for years on this topic. I think it should be clear to people listening that there is no space between them. They are approaching this in a bipartisan manner. They understand how important it is. And yes, Senator King is correct. We are talking about preventing. We are talking about being strong enough to prevent a nuclear war, and nothing could be more important. And yes, it is going to be expensive, but there is no question about it, we are going to have to spend the money as wisely and efficiently as we can to get the job done.

I want to thank Senator [sic] Cotton for his service and wish him well as he prepares to transition into private life, and thank you, General Whiting, for being here.

I am going to put my statement in the record and just say that today I hope to understand how you are managing the risks of critical military capabilities that are both too old and too few to truly meet the threats of today, much less those of tomorrow.

Second, how to understand better the roles of your commands evolving as the new Administration develops updated strategies and guidance, and then hear your thoughts on areas where you believe this Committee can help improve the effectiveness of our strategic deterrent and space posture.

With that I will ask unanimous consent to include my statement in the record, and yield back.

Senator FISCHER. Without objection.

[The prepared opening statement of Senator Roger Wicker follows:]

PREPARED OPENING STATEMENT BY SENATOR ROGER WICKER

Thank you, Senator Fischer.

I would like to start by expressing my appreciation to Senator Fischer and Senator King for their leadership of the Strategic Forces Subcommittee over these past several years. Their close collaboration is a testament to what we can accomplish when we work together in a bipartisan manner on the most severe threats to our Nation.

As the commanders of U.S. Strategic Command and U.S. Space Command, you gentlemen represent both our first and last lines of defense. Our nuclear forces have formed the foundation of our national security since the end of the Second World War and have deterred major wars for over seventy years. Our space-based capabilities are our eyes and ears around the globe and form the communications backbone for U.S. military operations, including missile defense, worldwide.

We are all very aware of the growing military cooperation between China, Russia, Iran, and North Korea. This collaboration presents a complex and far-reaching set of threats that demands a generational investment to rebuild and revitalize America's military strength.

Unfortunately, the rise of these new challengers could not come at a worse time. The defense investments we made during the cold war have long since expired. Defense spending is near record lows as a percentage of our economy, and all aspects of our military forces are now in dire need of repair or replacement. This neglect is no more evident in the very military capabilities you General Cotton, and you General Whiting, are expected to bring to bear every hour of every day.

In your testimony today, I would like to understand how you are managing the risk of critical military capabilities that are both too old and too few to truly meet the threats of today, much less those of tomorrow. I would also like to better under-

stand how you see the roles of your commands evolving as the new administration develops updated strategies and guidance for the joint force. Finally, I would like to hear your thoughts on areas where you believe this committee can help improve the effectiveness of our strategic deterrent and space posture.

Chairman WICKER. Thank you, gentlemen. Thank you, Madam Chair.

Senator FISCHER. Thank you, Mr. Chairman. Ranking Member Reed.

STATEMENT OF SENATOR JACK REED

Senator REED. Thank you very much, Madam Chairman. Welcome, gentlemen. We look forward to your testimony. I want to commend General Cotton for his 39 years of service to the country and to the Air Force, and I wish you and your wife, Marsha, the very best in your retirement. General Whiting, thank you for joining us this morning also.

General Cotton, there are reports that indicate that the Administration is considering removing the dual-hatted role the Commander of U.S. European Command currently holds as the NATO Supreme Allied Commander Europe, or SACEUR. The SACEUR position was created, in part, to ensure that our nuclear weapons, and hence our nuclear umbrella provided to our NATO allies under Article 5, was always kept under the control of the United States. Indeed, the release codes for our nuclear weapons which are carried by NATO planes come from the President through SACEUR to unlock the weapons. If the U.S. walks away from this position, we are lessening the protection of our extended nuclear deterrent to our allies, and I believe we are harming U.S. national security and global security.

For over 6 decades, the United States nuclear umbrella has provided an iron-clad guarantee to deter the Soviet Union and now Russia, and it has been successful.

I am also concerned about the signal it may send to our Asian allies, especially South Korea, who also relies on the credibility of our nuclear umbrella.

These are difficult issues, and I hope in the course of the questioning we can get more details from you about that.

Again, thank you, Madam Chairman.

Senator FISCHER. Thank you, Senator Reed, and now I would like to have our opening statements from the panel. General Cotton, would you go first, please.

STATEMENT OF GENERAL ANTHONY J. COTTON, USAF, COMMANDER, UNITED STATES STRATEGIC COMMAND, DEPARTMENT OF THE AIR FORCE

General COTTON. Good morning, Chairwoman Fischer, Ranking Member King, Chairman Wicker, and Ranking Member Reed, and distinguished Members of this Committee. It is an honor for Sergeant Major Kramer and I to be here, alongside General Whiting and Chief Master Sergeant Simmons, and a privilege to continue representing the servicemembers, civilians, and families of United States Strategic Command.

I would like to thank this Committee and Congress for its continued support in providing us with the resources required to execute

our assigned missions. Above all else, I extend my gratitude to the American people for their enduring support of the military.

In my third and final year of serving as STRATCOM Commander it has been the most rewarding experience of my 39-year career. I have submitted my 2025 posture statement for the record.

I will begin by assuring you that the Nation's nuclear forces, which are foundational to our national security, are safe, secure, effective, and credible. As I speak, STRATCOM and its components are deterring our adversaries and stand ready to respond decisively, whether underground, in the air, or beneath the seas, should deterrence fail.

Our mission has never been more important. Today the United States, its allies and partners are confronted with a deteriorating security environment. The Chinese Communist Party is rapidly expanding its nuclear forces into a fully functional triad, with more than 600 nuclear warheads, and counting. Russia has modernized the majority of its nuclear arsenal. North Korea continues with its unlawful and destabilizing programs in pursuit of weapons of mass destruction and ballistic missiles, and Iran continues to pursue uranium enrichment.

Additionally, the tools of war are changing, from novel missile systems to counter-U.S. space capabilities, from cyberattacks against critical infrastructure to competition in the electromagnetic spectrum. These are rapidly developing threat vectors across multiple domains and regions, to include the Arctic.

To effectively deter our adversaries across the spectrum of threats requires sustained legacy triad systems and urgently completing the multigenerational, decades-long modernization of all three legs of the nuclear deterrent and its critical NC3 systems.

No portfolio is in need of recapitalization more than a nuclear portfolio, and the modernization I am advocating for requires continued, uninterrupted funding and an industrial base capable of steady and continuous production. Commitment to modernization will ensure that U.S. strategic weapons continue to deter aggression, assure our allies and partners, and allow us to achieve national objectives if deterrence fails.

Thank you again for your support and focus on our mission, and I look forward to answering your questions.

[The prepared statement of General Anthony J. Cotton follows:]

STATEMENT OF

GENERAL ANTHONY J. COTTON

COMMANDER, UNITED STATES STRATEGIC COMMAND

BEFORE THE SUBCOMMITTEE ON STRATEGIC FORCES,

SENATE ARMED SERVICES COMMITTEE

MARCH 26, 2025

INTRODUCTION

United States Strategic Command (USSTRATCOM) is a global warfighting combatant command (CCMD). Our mission is to deter strategic attack through a safe, secure, effective, and credible global combat capability and, when directed, prevail in conflict. Our assigned responsibilities of strategic deterrence; nuclear operations; nuclear command, control, and communications (NC3) enterprise operations; joint electromagnetic spectrum operations (JEMSO); global strike; and missile threat assessment underpin national security and global stability, helping to deter conflicts and achieve Presidential objectives should deterrence fail. The dedicated individuals accomplishing these missions are the foundation of our success, ensuring the safety and security of our Nation and our Allies, 24 hours a day, 365 days a year.

I want to thank the President, Secretary of Defense, and senior department officials for their continued leadership in support of USSTRATCOM's mission areas. I would also like to thank Congress for its continued support in providing us with the resources required to execute our assigned missions. Above all, I extend thanks to the American people for their enduring support of the military. Serving as the USSTRATCOM Commander has been the most rewarding experience of my 39-year career.

Today, the United States, its Allies, and partners are confronted with a deteriorating security environment. The Chinese Communist Party continues to increase its military capabilities and represents our greatest strategic challenge. The Russian Federation continues to modernize and diversify its arsenal, further complicating deterrence. Regional actors, such as the Democratic People's Republic of Korea (DPRK) and an increasingly aggressive Islamic Republic of Iran, add complexity to our strategic calculus. These actors routinely violate international law, challenge the stable and open international system, and take actions around the globe to advance authoritarianism.

The United States achieves peace through strength. Nuclear weapons and the nuclear mission underpin all of our national defense priorities. The United States will maintain flexible nuclear capabilities and tailored deterrence strategies for potential adversaries that reflect our best understanding of their decision-making and perceptions to effectively deter across a spectrum of adversaries, threats, and conflicts.

OUR PEOPLE

People are the cornerstone of our organization—they make deterrence credible. USSTRATCOM relies on a team of nearly 41,000 military, civilian, and contractor personnel steadfast in their dedication to our diverse mission. We must continue to attract, develop, and retain this valuable resource through career-enhancing experiences, targeted professional development, and a robust internship program to ensure personnel are postured to meet challenges ahead.

We are committed to advancing the knowledge base of strategic deterrence theory, NC3, and JEMSO outside of USSTRATCOM—across the DoD, government, academia, Allies, and partners. Beyond education, recruiting talent and increasing the number of science, technology, engineering, and mathematics experts and skilled trade professionals in our Nation's workforce is a national priority—vital to nuclear enterprise modernization initiatives and advancing electromagnetic spectrum (EMS) superiority. Increased focus on these areas is essential to achieve the revitalization of the defense industrial base and Department of Energy national labs to deliver the capabilities we need to execute our assigned missions.

GLOBAL SECURITY ENVIRONMENT

Since my March 2024 testimony, the global security environment has grown more complicated. I continue to emphasize that Cold War strategies are insufficient in today's complex environment. The character of warfare continues to evolve; gray zone tactics, advanced technologies, growing adversary transactional relationships, and economic entanglement between nation-states complicates our decision calculus in ways never imagined during the Cold War. Together with the Services and other CCMDs, we are addressing five evolving threat vectors: cyber, counter-United States space capabilities, novel missile systems, a contested and congested electromagnetic spectrum, and supply chain interdiction.

CHINA

The CCP's nuclear modernization efforts continued throughout 2024. General Secretary Xi Jinping's directive that China be prepared to seize Taiwan by 2027 has driven CCP investment in the expansion of its land-, sea-, and air-based nuclear delivery platforms and the infrastructure necessary to support a major build-up of its nuclear forces. This expansion is complemented by an increasing capacity to create plutonium from fast breeder reactors with Russian support. Despite claiming technologies for these reactors and reprocessing facilities are intended for peaceful purposes, China likely aims to produce plutonium for its weapons program.

Beijing probably continues to load new solid-propellant intercontinental ballistic missiles (ICBMs) into the silo fields that I first reported to you in January 2023. These fields consist of 320 silos across Western China. China has surpassed 600 deliverable nuclear warheads and is forecasted to have over 1,000 nuclear warheads by 2030, many of which will deploy in higher readiness levels. This force is expected to grow through 2035 in line with the People's Liberation Army (PLA) modernization goal of becoming a "world class" military by 2049.

The PLA Navy's six operational JIN-class ballistic missile submarines (SSBNs) represent China's first credible sea-based nuclear deterrent. Each JIN-class SSBN carries up to 12 missiles, and China's next-generation TYPE 096 SSBN will reportedly be armed with longer range sea-launched ballistic missiles (SLBMs). Based on the projected 30-plus-year service life of the platforms, China will operate its JIN and TYPE 096 SSBN fleets into the 2050s.

China's H-6N bomber is capable of carrying air-launched ballistic missiles armed with nuclear warheads; last year, Beijing used H-6Ns for the first time during its ninth combined bomber patrol with Russia. China is also developing a strategic stealth bomber, the H-20, believed to have a range of 5,000 miles and the capability to threaten the continental United States.

RUSSIAN FEDERATION

Russia maintains the largest and most diverse nuclear arsenal in the world—including 1,550 deployed strategic nuclear warheads and up to 2,000 non-strategic nuclear warheads. Russia's non-strategic nuclear warheads are unconstrained by any treaty obligation, and its refusal to negotiate a follow-on to the treaty between the United States of America and the Russian Federation on Measures for the Further Reduction and Limitation of Strategic Offensive Arms (New START) means its strategic warheads will be unconstrained after the treaty expires in February 2026.

Russia's ICBM force is comprised of 310 missiles capable of carrying up to 1,200 warheads. Despite recent testing challenges with the RS-28 Sarmat ICBM, Moscow continues to pursue this new ICBM, which has a range of 11,000 miles, the ability to carry multiple nuclear warheads, and a future fractional orbital bombardment capability. Russia's Skyfall nuclear

powered strategic cruise missile remains in testing and has not yet been formally certified for combat.

The sea-based leg of Russia's triad is comprised of at least 10 DELTA and BOREI-class SSBNs equipped with up to 16 SLBMs each, and the fleet is capable of carrying more than 700 warheads. The Russian Strategic Navy continues to modernize by adding new BOREI-class submarines and deploying new SS-N-32 SLBMs. Russia is also developing the submarine-deployable Poseidon autonomous underwater vehicle, which may be armed with a two-megaton nuclear payload. Lastly, Russia's multi-mission Severodvinsk SSGNs are armed with long-range KALIBR cruise missiles designed to destroy enemy ships and land-based targets.

Russia's air-leg has up to 70 strategic bombers—comprised of the Tu-95MS Bear and the Tu-160 Blackjack—which are being modernized to operate beyond 2030. The Bear can carry up to 16 AS-15 nuclear-armed cruise missiles, while the Blackjack can carry up to 12. Both aircraft are capable of carrying nuclear gravity bombs. Moscow will complete development of its new PAK-DA bomber within a decade, which will include stealth capabilities and employ both conventional and nuclear armament.

Russia's hypersonic weapons, such as the Kinzhal, Tsirkon, and Avangard, provide Moscow with a myriad of escalation options within its portfolio. These weapons present intercept challenges to current air defense systems. Finally, we remain concerned that Russia may intend to put a space-based nuclear weapon on orbit. Placing the first nuclear-armed weapon in space would be destabilizing.

DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA

In 2024, Kim Jong Un vowed to intensify efforts to make his nuclear force fully ready for combat with the United States. Since 2006, North Korea has conducted six underground nuclear

tests, each successively demonstrating a higher explosive yield. Pyongyang also continues to increase its stockpile of plutonium and highly enriched uranium in support of its nuclear program.

In addition to stockpiling nuclear materials, the DPRK has routinely conducted ballistic missile flight tests and training launches and has expanded both the number and type of nuclear-capable delivery systems. North Korea launched two solid-propellant ballistic missiles purportedly loaded with hypersonic payloads in 2024 and debuted a new, more powerful solid-propellant ICBM. Increasing reliance on solid-propellant systems allows Pyongyang to launch missiles with much less warning than before.

The DPRK continues to make progress on its sea-based platforms. In 2023, North Korea claimed to unveil a tactical nuclear warhead capable of being mounted on at least eight delivery systems, including an unmanned underwater vehicle. In 2024, Kim Jong Un inspected a project to construct the country's first SSBN, although this capability is unlikely to be realized in the next decade.

ISLAMIC REPUBLIC OF IRAN

The Islamic Republic of Iran continues to expand its nuclear program by increasing its stockpile of highly enriched uranium and deploying additional advanced centrifuges. Tehran has reduced the time required to produce sufficient weapons-grade uranium for a nuclear device from 10-15 days to presumably less than one week.

Iran possesses the region's largest arsenal of conventional ballistic missiles, which it employed in attacks on Israel last year. Tehran continues to proliferate advanced conventional weapons to non-state militia groups across the Middle East, resulting in attacks against U.S. and partner personnel and interests, undermining regional stability. Iran's work on space-launch

vehicles—including its two-stage, liquid-fueled Simorgh satellite carrier rocket—likely shortens the timeline to produce an ICBM due to the similarities in technology. This rocket could have a 2,400 mile range with a 2,200 pound payload.

GROWING TRANSACTIONAL RELATIONSHIPS

A defining feature of today's evolving strategic environment is the increasing prevalence of transactional relationships amongst nuclear-armed competitors and nuclear aspirants. Technology exchanges, troop deployments, combined exercises, and public affirmations of each other's violations of international law are increasing. The possibility of simultaneous conflicts makes complex escalation dynamics even more challenging.

China's "comprehensive strategic partnership of coordination" with Russia entails an increasing degree of military cooperation. Sino-Russian cooperation occurs through exchanges of training, equipment, technology, high-level visits, and other coordination mechanisms. Beijing is Moscow's top supplier of machine tools, microelectronics, and nitrocellulose—all critical to making munitions and rocket propellants—and Russia is using these items to ramp up its defense industrial base and circumvent extensive sanctions.

Iran and the DPRK are also contributing to the war in Ukraine. Tehran has been providing armed drones to Russia since 2022, as well as transferring hundreds of short-range ballistic missiles to Moscow and training personnel to operate these weapons. The DPRK has delivered over 11,000 troops and 16,500 containers of weapons and ammunition to Russia, including ballistic missiles, launchers, and millions of artillery rounds. Moscow has also signed a security pact with Pyongyang, which reportedly includes a mutual defense clause.

ACCOMPLISHING THE MISSION: THE TRIAD AND OTHER CORE FUNCTIONS

To address the challenges posed by the complex security environment, the United States must remain committed to sustaining legacy triad systems and completing the multi-generational, decades-long modernization of the nuclear deterrent, including all three legs of the triad and critical NC3 systems. As we modernize our capabilities, we must retain credible forces to deter strategic attacks, assure Allies and partners, and achieve U.S. objectives should deterrence fail. I urge Congress to continue supporting these critical sustainment and modernization efforts.

LAND-BASED TRIAD COMPONENT

The land-leg of the triad is our most responsive strategic deterrent option. It is a geographically dispersed, reliable, always-on-alert force with a robust NC3 system that guarantees receipt of emergency action messages from the President. Our Minuteman III ICBMs raise the threshold for any adversary considering a strike against the United States, because no adversary can be confident in its ability to destroy our ICBMs prior to launch. Our ICBMs are also rapidly re-targetable, enabling the necessary flexibility and adaptability in executing against multiple adversaries armed with diverse systems.

Minuteman III

Always ready, the MMIII continues to achieve a 98% mission capable rate with missiles on alert 24/7/365—a testament to the ability and steadfast dedication of our maintenance professionals. Asset attrition, aging, parts obsolescence, and sustainment shortfalls present operational challenges. Sustaining this capability until its replacement is fielded requires continued national investment to address specialized equipment and replacement parts

availability. MMIII must remain an operationally effective and credible deterrent until fully replaced by the Sentinel ICBM.

Sentinel

Sentinel's accuracy, range, responsiveness, safety, security, and sustainment capabilities will ensure the ICBM force remains a potent warfighting capability and a credible land-based nuclear deterrent through at least 2080. A complex mega-project replacing every facet of the MMIII, Sentinel will be accompanied by a secure and robust NC3 capability, a new missile, and hundreds of infrastructure projects, including hardened facilities spread across five states. The program consists of ICBM silos, thousands of miles of modern fiber optic cabling, acquisition of permanent and temporary real estate easements, and operational site activation efforts necessary to support the construction workforce and development of the Sentinel weapon system.

Any further Sentinel delay will increase USSTRATCOM's operational risk and impact the credibility of our deterrent. Despite the Sentinel program experiencing a critical Nunn-McCurdy breach last year, subsequent analysis revalidated program requirements and deemed Sentinel essential to national security. I remain committed to replacing the MMIII and support efforts to reduce Sentinel's cost and schedule risk.

SEA-BASED TRIAD COMPONENT

The sea-leg is the most survivable leg of the triad. The OHIO-Class SSBN fleet, paired with the Trident II D5 Strategic Weapon System, patrols the world's oceans virtually undetected, providing a resilient, reliable, and assured capability vital to the defense of the United States and our Allies and partners. Minimizing delays to delivery of the COLUMBIA-Class SSBN will guarantee the nation has survivable nuclear response options for decades to come.

OHIO-Class SSBN

The fourteen OHIO-Class submarines represent seventy-percent of our Nation's day-to-day nuclear capabilities. While a sufficient deterrent today, the fleet has been life extended to an unprecedented 42 years and will continue to face sustainment and readiness challenges until replaced by COLUMBIA-class submarines. OHIO will start decommissioning about one hull per-year beginning in 2027. USSTRATCOM, in close collaboration with DoD partners, is actively working risk reduction options, including life extension of select OHIO SSBN hulls to provide margin and SSBN operational readiness if COLUMBIA's first deterrent patrol is delayed.

COLUMBIA-Class SSBN

The COLUMBIA program of record (POR) will deliver at least 12 SSBNs, the absolute minimum required to meet strategic guidance. A life-of-hull reactor, improved combat control systems, electric propulsion drive, and other technological advancements will deliver unparalleled operational capabilities and stealth to ensure our SSBN fleet maintains its strategic advantage in the undersea domain into the 2080s. The COLUMBIA-class SSBN remains a high USSTRATCOM priority strategic deterrent program and must achieve its first strategic deterrent patrol by 2031 to avoid an unacceptable capability gap. USSTRATCOM will continue assessing capacity and capability across the nuclear triad to meet future demands and operational requirements.

Trident II D5

The Trident II D5 is the latest generation of submarine-launched fleet ballistic missiles. The Trident II D5 life extension 2 (D5LE2) program will field a modern, reliable, flexible, and

effective missile with advanced technology capable of adapting to emerging threats. D5LE2 is essential to support COLUMBIA-class SSBNs and requires timely and sufficient funding to ensure a viable SSBN deterrent through the 2080s.

Sea-Launched Cruise Missile – Nuclear (SLCM-N)

The SLCM-N, established as a new POR by the fiscal year 2024 (FY2024) National Defense Authorization Act (NDAA), will provide additional at-sea nuclear deterrent capability. This program will provide much-needed low-yield, non-ballistic, survivable, and persistent nuclear capability without visible generation, offering additional range, flexibility, and survivability for extended deterrence and assurance.

Anti-Submarine Warfare

Undersea systems have become a critical focus area of potential adversaries, resulting in threats more challenging to detect and counter. The Navy's Integrated Undersea Surveillance System (IUSS) provides vital information about submarine and surface ship operations, which is instrumental in enabling U.S. forces to maintain favorable tactical and strategic positions while supporting deterrent patrol operations. Russian submarine stealth and detectability advancements have made IUSS modernization an imperative. Additionally, to maintain our fleet's acoustic advantages in the undersea domain through OHIO to COLUMBIA modernization and beyond, supporting advanced modifications of large vertical arrays, advanced materials science and coatings, and other efforts within the Acoustic Superiority Program are absolutely necessary.

AIR-BASED TRIAD COMPONENT

The air-leg is the most flexible and visible leg of the triad. Bombers enable the United States to signal resolve while providing a flexible and recallable option to address escalation in conflicts or crises. The air-leg supports both strategic deterrence and conventional employment options around the globe to achieve national objectives.

B-52H Modernization

The B-52H is a 65-year-old platform slated to remain in service for at least another 25 years. It is critical to providing flexible strategic deterrence options to the President and is the threshold platform to carry the Long Range Standoff (LRSO) weapon. B-52H modernization upgrades include the Commercial Engine Replacement Program, Radar Modernization Plan, survivable NC3, and improved GPS reception via M-Code Resilient Embedded GPS Inertial Navigation systems.

Replacing the B-52H's 1960s-era engines will enable longer range and solve supply chain issues afflicting the legacy engines. The modernized radar will increase system reliability and reduce sustainment costs while providing new high-resolution ground mapping capabilities to improve target location accuracy. The Air Force is incorporating an advanced, survivable, secure, two-way strategic nuclear communications capability into the B-52. Continued and consistent Congressional funding and support to the Air Force to complete B-52 modernization programs is critical.

B-2 Modernization

The B-2 fleet remains the world's only low-observable bomber able to penetrate denied environments while employing a wide variety of munitions against high-value strategic targets.

With advancements and proliferation of anti-access and area denial technology, the capabilities provided by the B-2 remain critical to strategic deterrence and our ability to execute missions around the globe. The Air Force must continue targeted B-2 modernization and sustainment efforts until sufficiently replaced by the B-21. These efforts include low-observable signature and supportability modifications, updated secure beyond-line-of-sight and line-of sight communications capabilities, updated cockpit displays, compliance with DoD and NATO secure combat identification requirements, and cryptographic upgrades.

B-21 Raider

The B-21 Raider will form the backbone of America's future bomber force, replacing conventional B-1 bomber and nuclear-capable B-2 bomber fleets. The B-21 will ensure USSTRATCOM's ability to penetrate advanced air defenses far into the future and will provide strategic and operational flexibility across a wide range of military objectives. The program is on track to meet USSTRATCOM operational requirements, with the first aircraft scheduled for delivery in the late 2020s. The B-21 POR is for a minimum of 100 aircraft, which we assess as the minimum necessary to meet both nuclear operations and global strike requirements. Consistent funding of the B-21 program will prevent operational shortfalls in the bomber force and facilitate on-time delivery of this exceptional combat capability.

Air-Launched Cruise Missile / Long Range Standoff Weapon

The Long Range Standoff (LRSO) weapon will replace the Air Launched Cruise Missile (ALCM) as our Nation's air-delivered standoff nuclear capability. It is optimized for the future with a planned 30-year service life. The LRSO weapon will provide the President with flexible and scalable options capable of penetrating and surviving against advanced air defenses—a key

attribute and critical component to all USSTRATCOM operational plans. It is on track for production and deployment in FY2027 with planned initial operational capability in FY2030.

Tanker Support

The demand for tankers across Combatant Commands continues to grow. A robust tanker fleet is essential to sustaining global reach for all USSTRATCOM missions. The KC-135 serves as the backbone of U.S. air refueling capability. Tanker modernization and expansion efforts are imperative for concurrent operations encompassing strategic, theater, and homeland defense missions across CCMDs.

The KC-46 complements the legacy KC-135 tankers with increased capabilities and will be capable of refueling most fixed-wing, receiver-capable aircraft. We support Air Mobility Command's collaboration with the Air Force Nuclear Systems Center to certify the KC-46 for nuclear operations as soon as possible. We also endorse the Air Force's broader efforts to increase tanker connectivity and survivability while accelerating the growth and capacity of our tanker fleet.

Regional Deterrence Capabilities

Following the dissolution of the Soviet Union, America divested nearly all of its theater nuclear capabilities through the Intermediate Range Nuclear Forces Treaty, the Presidential Nuclear Initiatives, and other force posture decisions. The United States' forward deployed nuclear weapons in Europe are critical to NATO's nuclear deterrence. Unfortunately, the past decade has been marked by authoritarian regimes seeking quantitative and qualitative advancements in both strategic and theater nuclear capabilities. Russia, China, and North Korea are developing theater nuclear weapons in an attempt to offset the United States' and its Allies'

asymmetrical conventional superiority and to create deterrence challenges of their own at the regional level. USSTRATCOM will continue to work with U.S. European Command and other CCMDs to explore how U.S. nuclear forces can bolster regional deterrence in circumstances where potential U.S. adversaries possess a range of delivery modes, explosive yields, and existing and soon-to-be fielded systems.

NUCLEAR COMMAND, CONTROL, AND COMMUNICATIONS (NC3) ENTERPRISE

The President's ability to command, control, and communicate with the Nation's nuclear forces must remain effective and resilient under all circumstances—through all phases of conflict including strategic attack. Ongoing NC3 modernization efforts permit replacement of our legacy capability, provide enhanced missile warning, upgrade national-level conferencing backbone connectivity and security, and expand Presidential decision space. I appreciate Congressional support in ensuring a whole-of-government, national-level, modernized, cyber-instrumented, resilient conferencing capability integrated across stakeholders for shared operational situational awareness and decision-making.

NC3 Operations – Sustainment of Legacy Capabilities

In coordination with the Office of the Under Secretary of Defense for Acquisition and Sustainment (OUSD(A&S)) and other DoD stakeholders, we are employing the Detect, Decide, Direct mission framework to assess the NC3 enterprise, sustain legacy systems, and pursue modernization. The Detect component includes ground-based radars, satellites, and intelligence sources to provide situational awareness, warning, attack assessment, and status of friendly forces. The Decide component encompasses a robust combination of terrestrial-, aerial-, and space-based systems providing the President, advisors, and military commanders sufficient time

to consider options and decide on appropriate actions to maintain or restore deterrence. The Direct component consists of systems connecting the President to the Nation's nuclear forces to disseminate decisions under all conditions.

The DoD and the Nation are reliant on aging NC3 systems with a no-fail mission. As with the triad, we must sustain these systems until the next generation of NC3 is fielded. Key focus areas for USSTRATCOM include: the Survivable Airborne Operations Center (SAOC), E-130J Take Charge and Move Out (TACAMO) recapitalization, satellite communications, missile warning/missile tracking systems, the ground-based components of NC3 such as the Fixed Submarine Broadcast System radio transmitter sites, and securing data and information processes in cyberspace.

NC3 Modernization – Next Generation Capabilities

We are pursuing materiel and non-materiel solutions to address challenges to the enterprise through the development of next generation capabilities. In the last year, USSTRATCOM published three Joint Requirements Oversight Council-validated NC3 Initial Capabilities Documents (ICDs), and we expect to publish six more in FY2025. These ICDs are focused on interoperability, adaptability, and providing assured nuclear command and control under all conditions. With OUSD(A&S) and OUSD for Research & Engineering, we are teaming with the Services, academia, national laboratories, and industry to explore emerging technologies through prototypes, demonstrations, and experimentation. Furthermore, we are conducting a series of trade-space studies to accelerate modernization of the enterprise.

NC3 Cybersecurity and Artificial Intelligence / Machine Learning Capabilities

In close partnership with key stakeholders, USSTRATCOM is leading the DoD's efforts to improve NC3 enterprise system and network sensing, monitoring, and response capabilities necessary to detect attempted intrusions and prevent unauthorized access or denial of service. Key to long-term viability is cybersecurity integration and sustainment throughout program lifecycle and tailored incorporation of artificial intelligence / machine learning (AI/ML) and advanced data analytics for improved situational awareness and timely response.

The Congressionally directed and USSTRATCOM-led Cyber Instrumentation Pilot (CIP) is intended to deliver an effective, advanced, rapid, and standards-based construct for NC3 cybersecurity from the edge to the enterprise. Designed to be hardware agnostic, the CIP is interoperable with other analytic tools within the NC3 enterprise to achieve efficiencies and accelerate capability delivery tailored for each site and platform.

USSTRATCOM will use AI/ML to enable and accelerate human decision-making. To fully utilize the potential of AI, USSTRATCOM requires data scientists with expertise in AI and advanced platforms across multiple classifications. Opportunities exist to leverage the emerging digital engineering environment to bridge the gap toward adopting AI/ML into the nuclear systems architecture. AI will remain subordinate to the authority and accountability vested in humans. In all cases, the United States will maintain a human "in the loop" for all actions critical to informing and executing decisions by the President to initiate and terminate nuclear weapon employment.

JOINT ELECTROMAGNETIC SPECTRUM OPERATIONS (JEMSO)

The EMS is a critical maneuver space in modern warfare. Understanding the impact a contested and congested EMS environment has on our forces' ability to operate is imperative.

The standup of the USSTRATCOM JEMSO Center (JEC) in 2023 effectively established a much-needed singular voice as the operational lead for the Joint Force EMS enterprise. The JEC provides JEMSO support to CCMDs and partner nations, supports joint force training and readiness, and assesses and develops recommendations for the Chairman of the Joint Chiefs of Staff to provide military advice regarding JEMSO capabilities and guidance. Updating the previous global assessment conducted in 2023, we developed a novel, data-centric, model-based methodology to analyze the effectiveness of Joint Force EMS capabilities through an interactive wargame. In 2024, the JEC also established a program designed to identify shortfalls by standardizing the field-training exercise evaluation of the Services' ability to conduct JEMSO.

Force readiness requires training and exercising in operationally realistic representative environments—a difficult challenge due to increasing demands for spectrum. The JEC is working with the Joint Staff and DoD Chief Information Officer (CIO) to ensure regulators fully understand the operational impact of sharing or vacating specific spectrum bands. The JEC also participates in the Partnering to Advance Trusted and Holistic Spectrum Solutions (PATHSS) working group—bringing together DoD, industry, national laboratories, and academia to develop and demonstrate dynamic spectrum sharing technologies. Additionally, the team is coordinating with the Federal Aviation Administration (FAA) to improve GPS testing, training, and exercise processes to optimize training range availability in support of the FY2024 NDAA. By ensuring unfettered access to identified EMS bands, we can continue to ensure the safety and security of our Nation, our Allies, and our partners.

EFFECTS INTEGRATION

USSTRATCOM does not command or control all of the elements required to execute a deterrence strategy. The Nuclear Employment Strategy of the United States requires integration

of non-nuclear capabilities into U.S. nuclear planning where non-nuclear capabilities can support the nuclear deterrence mission. The growing risk of conflict with a nuclear-armed aggressor has solidified support for effects integration. A robust set of nuclear and non-nuclear capabilities, effective across a range of potential conflict scenarios, is necessary to successfully conclude conflict while managing escalation. As part of our deterrence strategy, USSTRATCOM is expanding efforts towards Conventional Nuclear Integration (CNI).

CNI encompasses more than kinetic conventional support to nuclear operations and requires the integration of non-kinetic capabilities to complement and enhance nuclear operations. Operations in the information environment (OIE) capabilities—to include cyber, space, EMS operations, military information support to operations (MISO), and public affairs capabilities—should be leveraged to influence the decisions of competitor leadership. The integrated employment of these forces and capabilities, combined with conventional and nuclear operations, must be considered throughout all phases—from competition to conflict.

USSTRATCOM—in partnership with seven CCMDs, the Joint Staff, Army, Air Force, and Navy—is in the midst of a two-year Joint CNI Test to develop a concept of operations (CONOP) that describes the process for developing CNI options during competition. The intent for this CONOP is to be ready for refinement in crisis and executable in combat upon approval. This effort is informing the conventional munitions requirements process to support previously unaddressed CNI operational requirements and to ensure the United States is postured effectively.

Conventional Kinetic Operations

Two decades ago, USSTRATCOM recognized the need for a conventional prompt global strike weapon system to hold distant, defended, and/or time-critical threats at risk when other

forces are unavailable, incapable, or not preferred. The need for these weapons is more important today as we witness the rapid expansion of adversary military capabilities and rising tensions around the world. USSTRATCOM will use long-range precision strike conventional munitions to enhance the traditional capabilities inherent in the nuclear triad and implement CNI initiatives, in turn bolstering deterrence capabilities in support of strategic deterrence.

Hypersonic weapons provide a highly responsive, long-range, non-nuclear strike capability to hold critical targets at risk across all stages of conflict. Hypersonic weapons will also mitigate shortfalls in current standoff conventional weapons capacity and capability. We support the Services' continued development of hypersonic weapon systems through flight test programs, robust modeling and simulation, and ground testing.

USSTRATCOM continues to advocate for rapid development and fielding of advanced conventional capabilities, including the Army's Long Range Hypersonic Weapon and Navy's Conventional Prompt Strike. Partnerships leveraging commercial infrastructure and launch vehicle providers significantly increase the Nation's capacity for ground and flight testing of hypersonic payloads and technologies. These efforts are critical to pace the current threat and to field transformational capabilities within the Future Years Defense Program.

USSTRATCOM led concepts of operation and employment initiatives and has developed tactics, techniques, and procedures to ensure hypersonic weapons are ready to employ on day one of fielding. These weapons will directly contribute to USSTRATCOM fulfilling its assigned responsibilities of strategic deterrence and global strike. We will continue to work with the Services and the Joint Staff to codify and integrate CNI munition requirements into the munitions requirements process.

The Asymmetric Advantage of Allies & Partners

U.S. Allies and partners are a critical component of deterrence and provide an asymmetric advantage that potential adversaries cannot outmatch. China, Russia, DPRK, and Iran do not integrate as we do through planning, exercising, and combined operations. The relationships and mutual commitments the United States has with its Allies and partners are grounded in a shared set of systems and values.

USSTRATCOM is committed to enhancing combined force interoperability. USSTRATCOM components have significantly increased Allied integration in the maritime and air domains, and we are on a path to conduct effective CNI in the near future. Last year, our SSBN forces integrated across five CCMDs and five Allied nations, successfully synchronizing near-simultaneous Pacific, Atlantic, and Caribbean submarine operations. Our Bomber Task Force global campaign operations included over 200 days of overseas presence, 140+ missions in partnership with all CCMDs, and integration with 35 partner nations in FY2024—effectively projecting U.S. global strike power and interoperability.

Exercises and Wargames

We train as we fight, and any real-world conflict requiring USSTRATCOM to restore deterrence will—by the very nature of global conflict—require the participation of other CCMDs, government agencies, and Allies and partners. Exercises and wargames are designed to demonstrate the Command's ability to execute all facets of our Unified Command Plan (UCP) assigned mission areas, ensuring we maintain readiness at the highest levels.

USSTRATCOM annually sponsors two strategic and operational-level wargames focused on political-military decision-making research. Both Deterrence and Escalation Game and Review (DEGRE) and POWER uniquely challenge strategic thinking and decision-making,

along with the Joint Staff's series of Globally Integrated Exercises (GIE) and Globally Integrated Wargames. These wargames incorporate strategic deterrence, assurance, and escalation dynamics to inform whole-of-government, CCMDs, and Allies on full spectrum warfighting against a reactive nuclear-armed adversary.

In 2024, USSTRATCOM conducted two CCMD strategic-level joint exercises and 25 component operational-level exercises. We will continue to work with the CCMDs and Joint Staff to focus on improving NC3 capabilities through the Chairman's Exercise Program, incorporate EMSO-centric learning objectives, and synchronize efforts and collateral initiatives to deter conflict and prepare the Joint Force for future conflict if deterrence fails.

ACCOMPLISHING THE MISSION: INDUSTRY, INFRASTRUCTURE & SECURITY

USSTRATCOM cannot accomplish its mission without industry support, a robust and resilient infrastructure, and the security apparatus that supports the triad and our core functions. These key enablers ensure our weapons and delivery platforms are designed and manufactured to fight and win today and into the future.

NATIONAL AND DEFENSE INDUSTRIAL BASE

A healthy industrial base that can provide advanced technology, capability, and capacity on-time is fundamental to our ability to compete strategically. We must have steady and continuous production from the Department of Energy's National Nuclear Security Administration (NNSA) facilities as it is a force multiplier for national defense and strategic deterrence. In alignment with the 2023 DoD National Defense Industrial Strategy, we advocate to expand stockpiles of the critical parts, finished goods, and commodities needed to meet production requirements for conducting sustained campaigns against adversaries.

Submarine Industrial Base

The number of submarine industrial base (SIB) suppliers reduced from approximately 17,000 in the post-Cold War period to nearly 5,000 today. This reduction is not without cost, as production levels will shape the Nation's undersea dominance and sea-based strategic deterrence well into the 2080s. Current shipyard infrastructure capacity is insufficient to accommodate the one COLUMBIA-class SSBN plus two VIRGINIA-class SSNs per-year build plan (1+2 build plan) by FY2026 (the year in which COLUMBIA-class serial production starts). Thanks to Congressional support to date to increase SIB capacity to meet this 1+2 build plan, we are making progress to ensure the Navy remains the world's preeminent submarine force.

STOCKPILE AND WEAPONS INFRASTRUCTURE

Today's stockpile is sufficient to achieve current strategic deterrence objectives. Sustaining this for the long term will require confidently assessing the performance of aged weapons until they can be replaced, on-time fielding of replacement weapons, and the infrastructure to support both. While we can currently mitigate these risks, they do potentially impact the long-term viability of weapons in all three legs of the strategic triad.

The credibility of strategic deterrence relies on the effectiveness of the stockpile and the infrastructure needed to maintain the current weapons while producing modern replacements. This requires a Nuclear Security Enterprise (NSE) with efficiencies in development and production processes, modular weapon designs to enable rapid adaptability to meet emerging needs, and an enterprise-wide science, technology, and engineering (ST&E) effort to enable the development and maturation of technologies outside of specific stockpile programs. These attributes will move us towards a resilient and responsive enterprise and build the residual capacity to respond to uncertainty without impacting planned PORs. As we undertake our

stockpile modernization POR, the W93 is the first practical opportunity to "design in" modularity and begin to field the infrastructure and ST&E portfolio we will need for the future. My staff submitted requirements for both the ballistic missile and the air-delivered nuclear weapons to guide development of the next generation of nuclear warheads.

Stockpile modernization efforts reached significant milestones in 2024. The NNSA completed the first production unit for a war reserve W87-1 plutonium pit, and is now working towards rate production of 30 pits per-year at Los Alamos National Laboratory and 80 pits per-year overall. Re-establishing a credible plutonium pit manufacturing capability remains the top stockpile priority, but we must not lose sight of other initiatives—including uranium manufacturing, high explosives manufacturing, lithium processing, tritium production, radiation-hardened electronics production, and non-nuclear components production. Continuous production is absolutely necessary to ensure the United States is postured to address long-term challenges.

Additional stockpile modernization progress was achieved with completion of the B61-12 life extension program and the W88 Alteration 370 program remains in full-scale production; the B61-13 was also established as a POR. As with infrastructure modernization, considerable work remains to modernize the nuclear weapons stockpile, including the air-leg's W80-4, the land-leg's W87-1/Mk21A, and the sea-leg's W93/Mk7. It is imperative these programs remain on track or the Nation will continue to rely on older weapons with increasing uncertainty in their viability into 2040 and beyond.

NUCLEAR SECURITY

We employ a range of active and passive security measures to ensure protection of our weapons, systems, bases, structures, and personnel from damage or loss. As we continue to

assess and analyze threats to fielded forces and strategic capabilities, we will shape and advocate for programs to close security gaps and maintain stringent security standards to deter, detect, delay, deny, and defeat threats.

MH-139A Grey Wolf Helicopter

The MH-139A increases the overall protection of our nuclear arsenal by providing an enhanced rapid response against threats to our land-based ICBM infrastructure. In 2024, seven MH-139As were delivered to Malmstrom Air Force Base (AFB); F.E. Warren AFB and Minot AFB are projected to receive their first MH-139As in FY2026 and FY2027, respectively. When compared to the legacy UH-1N, the MH-139A provides enhanced speed, range, endurance, payload, and survivability.

Weapon Generation Facility

Existing Weapon Storage Areas (WSA) house the Nation's most critical weapons. The Air Force's Weapon Generation Facility (WGF) recapitalization program will replace 1960s-era WSAs with a modern, reinforced facility to house nuclear weapons maintenance, storage operations, and weapon generation activities under one roof. These WGFs are vital to security, sustainment, and fielding of Sentinel, B-21, and the LRSO weapon. Planned WGFs are required at ICBM bases (F.E. Warren AFB and Malmstrom AFB), bomber bases (Barksdale AFB, Ellsworth AFB, Dyess AFB, and Whiteman AFB), and the dual-mission ICBM/bomber base (Minot AFB).

Uncrewed Systems (UxS)

The proliferation of UxS in multiple domains with increasing technological sophistication poses a challenge to the Department and our Nation's nuclear enterprise. The lethality of UxS in conflict zones worldwide compels urgency in fielding effective countermeasures. USSTRATCOM seeks highly effective counter-uncrewed system capabilities and authorities to protect strategic assets and critical installations. We urge Congress to continue supporting development of UxS detection and tracking capabilities and countermeasures to ensure strategic options for the President to meet the challenges of an evolving strategic environment.

Missile Threat Assessment

Maintaining USSTRATCOM's ability to deter and respond to strategic attack by potential adversaries requires defenses against all types of advanced missiles and other novel delivery systems. Pursuant to the January 27, 2025, Executive Order on the Golden Dome for America, and in cooperation with the Office of the Secretary of Defense, U.S. Northern Command, and other DoD stakeholders, we are actively assessing strategic missile threats and prioritizing a set of locations to defend against a counter-value attack by nuclear-armed adversaries. Defending North America and our interests around the globe—to include the Arctic—is inherently linked to the ability of the Joint Force to operate. We also support improvements in early warning, identification, tracking, discrimination, and attribution for the full range of advanced air and missile threats to the homeland and our strategic forces to support U.S. Space Command's trans-regional missile defense responsibilities.

CONCLUSION

USSTRATCOM's mission is more important than ever. Our focus remains to deter strategic attack on the United States and its Allies and partners, and we stand ready to respond to threats anywhere, anytime, across all domains. I have full faith and confidence in the safety, security, effectiveness, and credibility of our Nation's strategic deterrent due to the proficiency and professionalism of the dedicated Soldiers, Sailors, Airmen, Marines, Guardians, and civilians committed to our mission. With continued Congressional support and stable, on-time funding, USSTRATCOM will continue to effectively defend the Nation and preserve peace for future generations.

Senator FISCHER. Thank you, General Cotton. General Whiting.

STATEMENT OF GENERAL STEPHEN N. WHITING, USSF, COMMANDER OF UNITED STATES SPACE COMMAND, DEPARTMENT OF THE AIR FORCE

General WHITING. Chairwoman Fischer, Ranking Member King, Chairman Wicker, and Ranking Member Reed, and Members of the Subcommittee, thank you for your support and the opportunity to represent the warfighters of U.S. Space Command. It is truly an

honor to testify alongside my friend, General Cotton, once again, and to discuss our vital role in achieving peace through strength.

At U.S. Space Command our guiding principle is clear. To secure peace, we must be well-prepared for conflict in space, and if deterrence fails, we will fight and win. U.S. Space Command is upholding this principle in the face of operational threats, which continue to expand at a breathtaking pace, and which are being fielded deliberately to challenge the United States, the American way of life, and hold the Joint Force at risk. These novel and unprecedented developments include China's robust counter-space weapons and space-enabled kill chains, Russia's reported pursuit of an on-orbit nuclear anti-satellite weapon, and wide-ranging ballistic cruise and hypersonic missile threats.

Despite the growing threats, the United States maintains advantages in space thanks to the unified mission focus of our superb joint warfighters, our unmatched commercial space sector, and our expansive and more empowered alliances and partnership. Our foremost advantage, and the cornerstone of U.S. Space Command, are our officer, enlisted, and civilian personnel. No other nation can match our team's understanding of the complexities of space and the requirements to effectively operate in the most challenging area of responsibility. Our military has the best-trained, most capable space warfighting force in the world, and they stand dedicated to fight for America.

Since my last testimony, U.S. Space Command published our new campaign plan, integrating and synchronizing the Command's operations, activities, and investments with the Joint Force and the interagency, leaving no doubts to our opponents that we are stronger, more capable, and ready to counter any threat.

Over the past year, U.S. Space Command's commercial integration cell grew to 17 commercial mission partners, enhancing our threat information sharing at classified levels and improving our crisis action planning.

We also expanded Multinational Force Operation OLYMPIC DEFENDER to seven nations, with the addition of Germany, France, and New Zealand. This growth further strengthens partnerships and enables our allies to share the burden of collective space security.

That said, these advantages, and our ability to deter potential adversaries, cannot be taken for granted. Deterrence in space is consistent with other domains. It requires a keen understanding and clear communication of what we are deterring against; credible, acknowledged capabilities to impose costs on those who attack us; and resilient architectures to dissuade attack by making any effort futile.

Accordingly, U.S. Space Command is fully integrated into, and contributing to, the Department of Defense's implementation of the President's executive order to establish a Golden Dome for American missile defense shield.

U.S. Space Command appreciates Congress' significant support of numerous critical space superiority programs and in the recent fiscal year 2025 appropriations law. Looking forward to fiscal year 2026 and beyond, U.S. Space Command requires stable funding as well as effective and efficient acquisition programs, delivering ad-

vanced space capabilities to enable a balanced space deterrence force structure.

Most pressing are the delivery of integrated space fires, enhanced battle space awareness, and integrated command and control capabilities to achieve space superiority to defend the Homeland and protect and enable the Joint Force. The Unified Command Plan directs U.S. Space Command to protect and defend U.S., and as directed, allied and commercial space capabilities through necessary offensive and defensive space operations. Like other combatant commands, we require combat-credible kinetic and non-kinetic means to deter and counter adversary actions.

By investing in space superiority capabilities we send a clear message: the United States has the advantage, and we remain committed that space will be safe, secure, and stable. We are ready to repel all challengers, and any attempt to turn space into a battle field will fail.

Although many challenges lie ahead, the future of space holds tremendous promise for America, if we actively and thoughtfully protect it. I am grateful for Congress' support to U.S. Space Command and continued investment to advance America's strength in space. Your continued backing not only ensures that U.S. Space Command protects our interests in space today but also protects that future which is coming.

Madam Chairwoman, I have submitted my posture statement for the record, and I look forward and the Subcommittee's questions.

[The prepared statement of General Whiting follows:]

UNITED STATES SPACE COMMAND

PRESENTATION TO THE
SENATE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON STRATEGIC FORCES
U.S. SENATE

Subject: Fiscal Year 2026 Priorities and Posture of United States Space Command

STATEMENT OF: General Stephen N. Whiting
Commander, United States Space Command

March 26, 2025

Introduction

Chairwoman Fischer, Ranking Member King, and Distinguished Members of the Committee,

Thank you for the opportunity to discuss the current strategic environment, U.S. Space Command's (USSPACECOM) accomplishments last year, and the opportunities ahead to further strengthen the Command's critical role in protecting and defending our national interests and providing the Nation a position of advantage in space. Our guiding principle is clear: to secure peace, we must be prepared for conflict extending to space, and if deterrence fails, we will fight and win. USSPACECOM will uphold this principle in the face of operational threats, which are expanding at a breathtaking pace and which are being fielded deliberately and specifically to challenge the United States, the American way of life, and hold the Joint Force at risk.

Since reestablishment in 2019, USSPACECOM has focused intensely on today's rapidly evolving and highly contested strategic environment. The increasing lethality and proliferation of space-enabled and cyber threats displayed in Ukraine and the Middle East, and the rapid advance of China's capabilities, demonstrate that winning the space fight is foundational to defending the nation, the readiness of the nation's forces, and reestablishing deterrence.

In this context, we fully leverage our authorities and resources to fulfill our Title 10 and Unified Command Plan (UCP) responsibilities. We take these missions so seriously that we talk about them in terms of moral responsibilities, of which there are three. Our first moral responsibility is to defend the Nation and the Joint Force from space-enabled attack by others. Our second moral responsibility is to deliver space capabilities to the Joint Force, our Nation, and our Allies across all levels of competition and conflict. And finally, we must protect and

defend the space systems critical to the Joint Force and our modern way of life against the threats now arrayed against us.

Despite the growing threats, the United States maintains advantages in space thanks to our unmatched commercial space sector, larger and more empowered alliances and partnerships, and, most importantly, the unified mission focus of our superb Joint warfighters. However, this position—and our ability to deter potential adversaries—cannot be taken for granted. Our opponents are rapidly delivering counterspace capabilities and new weapons that operate in, from, and to space.

Deterrence in space is consistent with other operational theaters: it requires a keen understanding and clear communication of what we are deterring against; credible acknowledged capabilities to impose unacceptable costs on those who would attack us; and resilient architectures to dissuade attack by denying the adversary the benefit they seek. We need to make clear that cost imposition need not be limited to the domain of the initial action. Achieving this level of deterrence demands not only strategic intent but also the timely development and fielding of new space capabilities.

USSPACECOM requires consistent and stable funding and effective acquisition programs to enable the rapid delivery of advanced space systems, in sufficient quantities to support deterrence and to win a conflict that starts in or extends into space. Most pressing are the delivery of integrated space fires, enhanced battlespace awareness, and integrated command and control (C2) capabilities to achieve space superiority to defend the homeland and protect and enable the Joint Force. By investing in lethality in, from, and to space, we send a clear message: the United States has the advantage, we are ready to repel all challengers, and potential adversaries will not achieve their end-states by extending conflict into space.

Game Changing Threats We Face In, From, and To Space

Today, we face concurrent and accelerating threats. These threats, extensively discussed over the years, are no longer future possibilities but operational realities. They span terrestrial, on-orbit, and cyber capabilities holding space systems in all orbital regimes at risk, capable of restricting Joint Force freedom of action in all domains and attacking the homeland with little warning. Naturally occurring threats, such as severe solar activity, also pose risks to the longevity and functionality of on-orbit assets. These risks must be considered in procurement and operational planning. I look forward to discussing these operational realities in a classified environment, but at the unclassified level, there are many developments that challenge our ability to execute our strategy.

These novel and unprecedented developments include China's space-enabled kill chains in the Indo-Pacific region and beyond; Russia's pursuit of an on-orbit nuclear anti-satellite weapon; and wide-ranging ballistic, cruise, and hypersonic missile threats. Moreover, growing bilateral cooperation and technology exchanges among China, Russia, Iran, and the Democratic People's Republic of Korea (DPRK) can enhance their space and missile capabilities, introduce new strategic dilemmas, and heighten risks of misperceptions or conflict escalation, creating significant challenges for the United States and our Allies and Partners.

China

China views space technologies as critical to its goal of becoming the dominant power in East Asia and a global superpower. The People's Republic of China (PRC) seeks to rival the United States in nearly all areas of space technology by 2030 and establish itself as the world's preeminent space power by 2045. Since 2015, China's on-orbit presence has grown 1000

percent, with 1094 active satellites as of January 2025. Its sophisticated space and counterspace systems enhance its ability to secure territorial claims, project power, and challenge U.S. advantages.

China integrates space capabilities with advanced missiles, enabling the People's Liberation Army (PLA) to find, fix, track, and target U.S. and Allied terrestrial forces using long-range, over-the-horizon, precision missiles to disrupt logistics and limit operational freedom in the Indo-Pacific area of responsibility (AOR). The PLA relies on over 300 intelligence, surveillance, and reconnaissance (ISR) satellites equipped with advanced sensors to detect U.S. aircraft carriers and expeditionary forces. Additionally, China's BeiDou Positioning, Navigation, and Timing (PNT) system provides precision targeting, coordination of troop movements, and advanced C2 capabilities.

China's counterspace operations seek to undermine how the U.S. military fights by disrupting or destroying space capabilities which are foundational to Joint Force operational concepts, effectively blinding and deafening friendly forces. The PLA is also developing on-orbit, maneuverable counterspace satellites to target our satellites using dual-use technologies, such as the Shijian-21 satellite, for potential offensive purposes against satellites we rely on to defend the homeland and project power. China's experimental satellites and operational ground-based systems, like direct-ascent antisatellite missiles, lasers, and jammers, give the PLA robust lethal and non-lethal counterspace options across the spectrum of conflict. Additionally, in 2024 Chinese scientists revealed efforts to develop a novel microwave weapon that could target satellites, reflecting a comprehensive counterspace approach.

China also leverages international partnerships and cutting-edge projects to challenge U.S. leadership in space. In 2024, it hosted the China-Latin America and Caribbean Space

Cooperation Forum to promote collaboration on space infrastructure and governance. China is also advancing Space Situational Awareness with tracking stations in Egypt and a space debris monitoring project in the Asia-Pacific region. China is investing in reusable launch vehicles to increase its spacelift capacity while lowering costs, and it is moving quickly in planetary exploration to potentially secure strategic advantages in key space terrain. Milestones such as the Chang'e-6 mission, which impressively returned lunar samples from the Moon's far side, further demonstrates China's growing space capabilities. These advancements, paired with international partnerships, underscore Beijing's strategy to erode U.S. leadership and establish itself as the dominant space power.

Russian Federation

Russia's space program remains a strategic priority for the Kremlin despite significant challenges from sanctions, international isolation, and funding constraints. Key efforts include developing a new Russian space station, advancing nuclear power in space, and enhancing Arctic monitoring for military operations. Despite delays and budget cuts, Russia maintains fleets of imaging satellites to support global military and paramilitary operations. Russia has also expanded its space-based support for operations in Ukraine with the launch of multiple satellites providing enhanced ISR since February 2022.

Russia has declared commercial satellites used for military operations as valid and legitimate targets. Russia continues to advance electromagnetic warfare (EW), directed energy, cyber, and both ground-based and co-orbital ASAT capabilities. In 2024 and already in 2025, Russian EW systems disrupted PNT services in the Baltic, Black Sea, and Mediterranean regions, causing flight diversions and Global Positioning System inaccuracies. These activities

underscore Moscow's ability and willingness to degrade military and civilian space systems and highlight the challenge with maintaining credible deterrence.

Most concerning, Russia is pursuing the possible placement of a nuclear weapon on-orbit. Detonating a nuclear weapon on-orbit would have indiscriminate effects, potentially disrupting the global use of space for security, economic, and scientific purposes. USSPACECOM has prepared our vital national security satellites for such a threat, and we will continue to support whole-of-government efforts and engage with likeminded nations to ensure that Russia understands the global community cannot tolerate a nuclear weapon in space.

Russia is also expanding space partnerships with its allies and U.S strategic opponents. In June 2024, Russia and the DPRK signed a comprehensive strategic partnership treaty that includes provisions for mutual defense and space collaboration. In October, demonstrating their growing collaboration, Iran sent two satellites to Russia for space launch services. Russia also continues to work with China on development of the International Lunar Research Station, BeiDou-GLONASS integration, and space debris monitoring. These partnerships highlight Moscow's efforts to leverage global influence in space to advance its strategic goals.

Evolving Missile Threats

The U.S. homeland and national interests face growing threats from the expanding and evolving offensive missile capabilities of peer, near-peer, and rogue adversaries. These advanced systems—including hypersonic glide vehicles (HGVs) and fractional orbital bombardment platforms (FOBS)—can launch into, transit through, or even originate from space, crossing multiple Combatant Commanders' AORs before striking their targets. The increasing diversity

and proliferation of these technologies complicate tracking, targeting, engagement, and determination of intended target location.

China continues to develop its wide-ranging missile program and is now the global leader in hypersonic payload capability. In 2021, a Chinese FOBS launch saw an HGV travel 25,000 miles within the defined space AOR before re-entering the atmosphere, aggressively maneuvering to strike a target in the Chinese mainland, which could just as easily have been a target within our homeland, like Washington, D.C., New York, or Los Angeles.

Russia's continued missile advancements strain U.S. sensors and defenses. Moscow has fielded three hypersonic systems with air, land, and sea launch options, featuring ranges over 6,000 miles carrying both conventional and nuclear capabilities, including two types of nuclear-armed HGVs. These advanced and long-range threats highlight the urgency to build the Golden Dome for America to protect our borders and skies against foreign coercion and aggression.

Elements of Victory: Achieving Integrated Success in Space

Given the scale and complexity of the threat environment we now face in space, there is no longer any doubt that space is a warfighting domain. Over the past five years, USSPACECOM has sharpened our understanding of space's contribution to modern all-domain warfare and what it will take for the United States to prevail in a war that starts in space or extends into space.

The full strength of national security space power must be harnessed as we rebuild our military to ensure credible deterrence. If called to transition from competition into crisis and conflict, the following Elements of Victory, essential to the United States, will ensure success. These elements are informed by the collective space warfighting and terrestrial warfighting

expertise of our Joint, Interagency, and Combined team, and will evolve to ensure we are fully prepared for a fight that, if it comes, we will win.

Operate Through a First Strike

Our most stressing scenario is operating through a first strike from an undeterred adversary while ensuring the space capabilities essential for victory continue to operate. We must anticipate, defend against, recover from, and immediately respond to a wide range of scenarios, conditions, and threats. Doing so will require robust defensive capabilities and resilient architectures across our integrated space enterprise.

The most consequential threat to our resilience is an attack on the United States from ballistic, hypersonic, and advanced cruise missiles, as well as emerging space-based weapons. Our legacy systems—Space Domain Awareness (SDA), space-based and terrestrial Missile Warning and Missile Defense, and satellite-enabled Nuclear Command, Control, and Communications—remain as vital today as ever in protecting the homeland. Recognizing this, our adversaries have developed terrestrial and on-orbit weapons designed to threaten these critical space capabilities, underscoring the urgent need to strengthen our defenses.

To counter this threat, USSPACECOM is fully supporting the Department of Defense's (DoD) implementation of the President's Executive Order (EO) to establish a Golden Dome Missile Defense Shield for America. Key efforts – as directed in the EO – include assisting in the development of capability-based requirements, reference architectures, and an implementation plan; supporting the acceleration and deployment of missile defense satellites, including the Hypersonic and Ballistic Tracking Space Sensor; supporting the development and deployment of proliferated space-based interceptors; enhancing non-kinetic measures to

complement kinetic missile defense; and conducting theater-based reviews to improve trans-regional missile defenses in coordination with the other Combatant Commands and key Allies and Partners.

Specifically, USSPACECOM is partnering with U.S. Northern Command (USNORTHCOM) and other stakeholders to write an Initial Capabilities Document aimed at defining capability-based requirements for the Golden Dome architecture, based on forecasted threat scenarios. As these capabilities develop and deliver, we stand ready to take an active role in the operation of a next-generation space architecture which will be resident in our AOR in support of protecting American citizens from attack.

In 2024, USSPACECOM conducted our first standalone Tier-1 exercise, APOLLO GRIFFIN, which focused on executing the command's mission through competition and crisis. This exercise allowed us to conduct a Combined/Joint fires rehearsal, and it successfully validated a Crisis Intelligence Cell, which supports planning and operations by enabling senior leaders and staff to make timely decisions at the pace of relevance. This summer, we are integrating APOLLO GRIFFIN with U.S. Indo-Pacific Command's (USINDOPACOM) Tier-1 exercise and the Joint Staff's ELITE CONSTELLATION exercise series to further mature the global and all-domain integration of space operations during conflict.

USSPACECOM also enhances space operations integration, interoperability, and resilience with Allies and Partners through Exercise GLOBAL SENTINEL, which explores meaningful international collaboration and contribution to space security and included 25 nations last year. Similarly, NIMBLE TITAN, led by our Joint Functional Component Command for Integrated Missile Defense (JFCC IMD), exercises missile warning and defense policies, partnerships, and information-sharing frameworks encouraging innovation and deepening

relationships. Last year, JFCC IMD brought together 25 nations and three international organizations to address policy changes and rehearse combined operations concepts.

Quickly and Seamlessly Transition from Crisis to Conflict

Our ability to quickly and seamlessly transition from crisis to conflict is essential to providing national leadership broad options and greater flexibility. Clear understanding of authorities, international agreements, access/basing/overflight requirements, and force posture are key tools we continue to develop. Robust and persistent campaigning simultaneously enhances deterrence and postures for conflict.

In 2024, USSPACECOM published our new Campaign Plan. The plan integrates and synchronizes our operations, activities, and investments with the Joint Force and Interagency to strengthen deterrence and posture for conflict. Developed in close consultation with our six Components, fellow Combatant Commands, Interagency partners, and our closest Allies, it establishes the foundation for maintaining our advantage in space—leaving no doubt to our adversaries that we are stronger, more capable, and ready to counter any threat.

Transitioning from crisis to conflict with an advantage requires timely and actionable intelligence. Over the past five years, USSPACECOM has made significant progress in this area. Our Intelligence Directorate, in collaboration with intelligence professionals across our Components, the Services, the other Combatant Commands, and the Intelligence Community, are driving forward intelligence activities to build a deeper understanding of the threat across the national space security enterprise.

Integrate and Synchronize Joint, Interagency, Allied, and Commercial Effects

Our ability to synchronize across organizational and national boundaries is enabled by comprehensive and clearly defined command relationships; fully integrated operational plans; tactics, techniques, and procedures (TTPs); and timely, secure, and resilient communications across the space enterprise. We achieve synchronization with the Joint Force through the integration of our plans and battle management capabilities with other Combatant Commands; with U.S.-led Allies and Partners through Multinational Force (MNF) Operation OLYMPIC DEFENDER (OOD); with our Interagency partners in protect and defend operations through the National Space Defense Center; and with our commercial partners through the Commercial Integration Cell (CIC) and the Joint Commercial Operations (JCO) cell.

USSPACECOM is undertaking a comprehensive rewrite of our primary Operations Plan (OPLAN) to ensure space integration across Combatant Commands is seamless, and Intelligence Community and commercial capabilities are integrated timely and effectively. With our revised OPLAN, USSPACECOM will be postured to ensure no adversary can disrupt or exploit our critical capabilities to gain an advantage.

America's rapidly expanding commercial space sector provides a significant asymmetrical advantage over our strategic competitors. To maximize this advantage, USSPACECOM updated its Commercial Integration Strategy, aligning it with the DoD's Commercial Space Integration Strategy and the U.S. Space Force's (USSF) Commercial Space Strategy. Our strategy focuses on three key areas: identifying and advocating for commercial systems and innovations, incorporating and operationalizing commercial capabilities, and informing and protecting commercial partners.

The CIC and JCO cell are two practical applications of this strategy. The CIC optimizes space effects by synchronizing actions between government and Commercial Mission Partners

(CMPs) and sharing operationally relevant information. Today, the CIC has 17 CMPs, expanding our sharing of threat information and TTPs at classified levels, and bolstering operations and crisis action planning from competition to conflict. This is enabling us to operationalize the Tri-Seal Commercial Space Protection Framework with the National Reconnaissance Office (NRO) and National Geospatial-Intelligence Agency. In addition, the JCO has 18 partner nations and NATO, who all work together to provide non-classified commercial data from 17 commercial companies to increase SDA for the United States and other partner nations.

We will continue to expand the CIC, within the Combined Space Operations Center, and JCO by adding new partners and mission sets as needed, building on recent successes. These cells demonstrated successful coordination during the Intelsat-33E anomaly and breakup event. During that event, the CIC coordinated with Intelsat (a member of the CIC), to obtain critical satellite data, while the JCO supported tracking of debris and helped assess close approaches with other satellites, providing tipping to our dedicated Space Surveillance Network. To build on this success, the CIC requires dedicated IT infrastructure at all classification levels, and a real-time CMP Common Operational Picture. The JCO also requires sufficient and predictable resourcing for all its critical missions. Congress' support for these efforts will ensure USSPACECOM can continue leveraging commercial partnerships effectively, enhancing operational capabilities and maintaining a strategic advantage in space.

One of USSPACECOM's greatest strengths is my role as head of the Multinational Force for Operation OLYMPIC DEFENDER (MNF-OOD). With Germany, France, and New Zealand joining last year, the seven-nation coalition enhances space operations, mission assurance, and resilience. As MNF-OOD moves toward Initial Operational Capability, it has published its first

multinational SDA Concept of Operations and is finalizing a seven-nation Campaign Plan to unify space operations. Achieving Full Operational Capability by 2027 requires integrated intelligence and mission planning, and coordinated missile warning, defense, and protect-and-defend operations. Through strengthened partnerships, we build greater collective understanding of threats, a shared burden of space security, the ability to collectively shape norms of responsible behavior in space, and enhanced interoperability for combined space operations should they be needed in conflict.

Finally, integrating as a Joint, Combined, and partnered team is challenging when access to critical information and capabilities is unnecessarily restricted, limiting effective planning and operations. We thank Congress for passing security classification reforms in the Fiscal Year 2024 National Defense Authorization Act, which address concerns about the over classification of space-related data and select space defense acquisition programs. USSPACECOM actively supports implementation of the DoD's December 2023 policy to reduce the classification level of space systems. Taking advantage of this policy will allow us to execute improved collaboration with the Joint Force, U.S. government agencies, Allies, and industry.

Deploy, Regenerate, and Reconstitute Space Forces

Our ability to deploy, regenerate, and reconstitute space forces throughout a protracted conflict must provide the Joint and Combined Force the requisite endurance to fight beyond the initial stages of conflict with sustained access to space capabilities. On orbit, sustained space operations require the right mix of responsive launch, sustained maneuverability, and logistics to allow for the operational availability, movement, and maneuver required to achieve a position of advantage over an adversary. These sustainment activities need to occur simultaneously across all domains, ensuring resilience and survivability throughout all phases of conflict.

Achieving sustained space maneuver requires investment in purpose-built systems—on-orbit refueling, in-space assembly, modular hardware upgrades, and urgent orbital resupply—to revolutionize how USSPACECOM achieves and maintains space superiority. Legacy space systems were constrained by the technological limitations of their era, launched with finite fuel and fixed payloads that offered minimal operational maneuverability, flexibility, or defensive capability. Future systems must overcome these limitations by enabling greater flexibility through dynamic maneuver, upgradability, and resupply. Platforms designed to support space maneuver should provide the capability and capacity needed to deter adversaries, maintain initiative, and conduct operations across all phases of competition and conflict.

USSPACECOM is conducting analysis to determine which systems and missions require these enhanced capabilities and recommended timelines for their implementation. This evolution will align space operations with maneuver warfare principles already applied in all other warfighting domains. For example, the X-37B, while a test and experimentation platform, highlights the potential for maneuver in space operations. The USSF's announcement last year regarding the X-37B's aerobraking maneuver—which allowed the vehicle to bridge multiple orbital regimes—demonstrates precisely the kind of operational flexibility and maneuverability that future systems must possess. Such capabilities are critical to avoiding operational surprise and enabling innovative operational concepts.

To enhance flexibility, operational effectiveness, and resilience, USSPACECOM also requires sustained investment in terrestrial mobile and transportable capabilities. These include EW capabilities like the USSF's Counter Communications System and the U.S. Army's Mobile and Theater Integrated Ground Suites; the U.S. Marine Corps' Electromagnetic Reconnaissance System; missile warning nodes such as the Space-Based Infrared System Survivable/Endurable

Evolution; and agile SDA capabilities provided by the U.S. Navy's Aegis Combat System. These mobile elements are critical for augmenting fixed networks, closing coverage gaps, and expanding the battlefield geometry of our space enterprise to counter evolving and dynamic threats.

Achieve Space Superiority

Our ability to achieve space superiority is foundational to Joint Force success. To deter strategic competitors, defend U.S., Allied, Partner, commercial interests, and protect the Nation and Joint Force, the Services require funding for three essential space superiority capabilities: Integrated Space Fires, Enhanced Battlespace Awareness for Space Operations, and Resilient, Timely Operational Space C2.

Integrated Space Fires are our most pressing need and are reflected as such in our Integrated Priority List. The UCP directs USSPACECOM to protect and defend U.S., Allied, and commercial space capabilities through necessary offensive and defensive space operations. Like all other Combatant Commands, USSPACECOM requires combat-credible lethal and non-lethal capabilities to deter and counter adversary actions. Interweaving space, cyber, special operations, and traditional maneuver force fires provides national leadership with the widest and most effective range of options and enables the greatest Joint Force lethality. Consistent and persistent funding and acquisition accountability are necessary to deliver integrated fires capabilities on an accelerated timeline—by 2027—to counter growing threats and ensure the Joint and Combined Force's freedom of action in space and on Earth.

USSPACECOM requires the requisite near-real-time domain awareness to close our kill chains, interdict adversary kill chains, and to outpace adversaries in today's increasingly

congested and contested space environment. Legacy SDA systems lack agility, making investment in interoperable sensors and dynamic architectures critical for timely detection, tracking, and characterization of space objects. Once operational, Silent Barker, Space C2 programs of record, and the future Deep Space Advanced Radar Capability will enhance our domain awareness. However, more advanced space-based and terrestrial systems are needed to dynamically track spacecraft in nonstandard orbits and, eventually, in farther regions beyond geostationary earth orbit out to Cislunar orbit. Continued investment is essential to ensure USSPACECOM's awareness keeps pace with rapidly advancing space systems and emerging challenges in space, enabling timely and informed decisions to protect critical space assets in this increasingly complex domain.

Resilient and timely space C2 is essential to closing friendly kill chains, deterring hostile actions, and defending U.S., Allied, and Partner interests. A modernized C2 capability is critical for managing space domain operations and supporting terrestrial operations in which space effects are vital. Last year, USSPACECOM identified four high-priority classified systems that require integrated C2 networks for connecting sensors to effectors. We are working with the Department of the Air Force, USSF, the Missile Defense Agency, and the NRO to ensure we have the necessary integration across multiple acquisition programs to field a more agile C2 capability, increasing kill chain speed and lethality by 2027. Investment in this and other C2 systems is essential for enabling the use of new space systems which the Services and Agencies are producing, building the resilience and integration needed to outpace adversaries, and achieving space superiority.

The robust and demonstrable ability to operate through a first strike, quickly and seamlessly transition from crisis to conflict, integrate and synchronize effects, deploy/regenerate/reconstitute

space forces, and achieve space superiority are key to credible deterrence and critical to victory in combat.

Conclusion

The threats we face in space are becoming increasingly lethal and widespread, demanding that we continually adapt to – and shape – a rapidly evolving strategic environment to strengthen our advantage and maintain deterrence. These challenges demand the full strength of the Joint Force, reinforcing USSPACECOM as we ensure their success in return.

We are at a critical juncture. Our most pressing threat, China, is marching towards General Secretary Xi Jinping's directed timeline for his armed forces to be ready to militarily reunite with Taiwan, a date that is now less than two years away. Though this is not a prediction of conflict, it is a reality that must be taken seriously. Furthermore, we are being threatened terrestrially and on-orbit with capabilities that seek to not only dull our ability to support the Joint Force, but also our ability to defend the homeland.

Armed conflict in space is not inevitable, and USSPACECOM remains committed to preserving space as a domain for peaceful exploration and use. Should deterrence fail, however, the integrated space power of our Joint, Interagency, Combined, and commercial team will provide a decisive advantage in any conflict. By realizing the full potential of our integrated space enterprise and elements of victory, we will prevail. With Congress' continued support, USSPACECOM will remain prepared to address the evolving threat landscape, deter aggression, counter adversary actions, and safeguard America's interests in space today and for generations to come.

Senator FISCHER. Thank you, General Whiting. We will begin with 5-minute rounds of questions.

I strongly believe that the Bipartisan Strategic Posture Commission's 2023 report should be required reading for everybody in the Department of Defense. It clearly articulates the threats that we face, and it concludes, rightfully concludes, that we are woefully underprepared.

Based on the recommendations of that report, last year's NDAA directed the Department to develop a deterrence strategy that

would pace this projected threat. This strategy must also include an assessment of the amount and type of nuclear weapons and delivery systems necessary to implement that strategy.

General Cotton, can you tell me how the development of this strategy is coming along?

General COTTON. Thank you, Madam Chairwoman. If you recall, when I first took over as the Commander of U.S. Strategic Command, one of the first thing we did was we instituted a nuclear recapitalization and transition cross-functional team to do exactly that, because one of the things we wanted to assure ourselves was did we have the capacity and capability and posture correct. That was in alignment with the study and the Commission's report, and it pretty much mirrored everything that was said in the Commission.

Since that time, what we have done is looked at the options that are available on all three legs of the triad. We are currently sufficient—currently—but in order to maintain sufficiency as we continue to have legacy systems online before the new systems come on board, there are some options within all three legs of the triad to increase capacity and capability.

Senator FISCHER. General Cotton, you recently said that the Air Force should procure at least 145 B–21 bombers. From your position, as STRATCOM Commander, can you share with us why you assess that that should be the new procurement floor?

General COTTON. Yes, Senator. When we first looked at the numbers of what would be required for the next generation of bombers to replace the B–1 and the B–2, that was a different geopolitical environment. We actually started a study in 2020, to ensure that our numbers were correct in regard to what we wanted to see the B–21 fleet look like.

At that point, the conversation from the Department would be a minimum of 100 B–21s should be procured, as we looked to see what the environment brought to bear. The other number that we would always talk about would be the 145 number, which would bring the total of the bomber force for the United States and allies—because the bomber force represents all the bombers for the Western world—would be about 220, and that would include the B–21s as well as the modified B–52J models that would come out.

Senator FISCHER. Thank you. General, as you know, this Committee, on a bipartisan basis, strongly supports SLCM, the nuclear-armed sea-launched cruise missile, and a program of record was included in our fiscal year 2024 NDAA. In your view as STRATCOM Commander, will SLCM-N address a capability gap?

General COTTON. It will, ma'am, and what it does for us is twofold. It gives the President a broader range of options, and I think that is my role and my job as a combatant commander is to present a broad range of capability and options for the President. It also provides—it is a regional tool that can be used, as well. So we can actually benefit from our geographic combatant commanders, which they support the idea of SLCM-N, as well, because from a regional perspective, it can hold adversaries at risk.

Senator FISCHER. Yes or no. Do you see opportunities to speed up that program?

General COTTON. I would hope so, Madam Chairwoman, and the reason is I know that there is a program of record that has been established in the Department of the Navy. I would love to see some acceleration from that team to see what we can do to get the assets a little quicker and move it to the left.

Senator FISCHER. Thank you. General Whiting, I want to get one question in for you at this point, as well. Every service relies on your assets that are based in space. I do not think that gets enough attention. Are you coordinating with the other combatant commands and also with the services, with the intelligence community, to make sure that these assets under your command are going to be integrated appropriately?

General WHITING. Madam Chairwoman, absolutely. In fact, I have a liaison element that I have assigned to each of the other combatant commands. So there is a liaison element from U.S. Space Command that sits inside of U.S. STRATCOM as well as all the other combatant commands to persistently do that type of coordination, to make sure that our operational plans are advancing together, that our real-time operations are considering each other's capabilities.

We do that with our intelligence community, as well, primarily through the National Reconnaissance Office. Again, we have an exchange of liaison officers and operational centers that work together. Then with the services, at the Joint Headquarters I have not only components from each of the services assigned to me but I have personnel from all of those services, which keep us tightly linked with their future plans, as well.

Senator FISCHER. Thank you. Senator King.

Senator KING. Thank you, Madam Chair. A couple of preliminary questions about staff. Both of you mentioned in your testimony that you rely upon not only military personnel but civilians. My question to each of you is, are you under any orders or have orders come down, or have you already started to implement, or has somebody started to implement reductions in force—firings, people who have taken, I call it the early retirement option? General Cotton what is the status of your civilian workforce?

General COTTON. Well, our civilian workforce, we are about 65 percent civilian in the headquarters, but that does not count for the 41,000 that make up the componencies that work under my charge.

Right now, Senator, very small amount of folks that took the early retirement activities, but the option for them to do so still exists. But right now we are not seeing an effect. The numbers are pretty small.

Senator KING. No firings?

General COTTON. We have not fired anyone.

Senator KING. Are you under any orders to reduce that staff by any certain percentage?

General COTTON. We are looking for the efficiencies piece, but right now it is all voluntary. Like I said, from our perspective, from STRATCOM, the numbers have been very, very small.

Senator KING. Are you subject to a hiring freeze?

General COTTON. I am.

Senator KING. So those people who are leaving, you are not allowed to replace. Is that correct?

General COTTON. Well, we have an opportunity to get a waiver approved because of our mission set, and if there is a requirement for us to do a waiver to see if we can get someone through the hiring freeze, we can process that.

Senator KING. General Whiting, same set of questions.

General WHITING. Senator, my answers are almost identical to General Cotton's. About 60 percent of my headquarters staff is Government civilians. We have had a small number who have volunteered for the deferred retirement program. We are under no orders to fire anyone. We are aware that we need to look for efficiencies, as General Cotton discussed. We also are under a hiring freeze, and we have the opportunity for critical positions to ask for exemptions to that.

Senator KING. Thank you. General Whiting, I was interested. You mentioned, I think it is called the Artemist Accords, which is clearly based upon allies. I am concerned that we seem to be in a process of alienating our allies. Talk to me about the importance of the Artemist Accords in order to carry out your mission.

General WHITING. Senator, the Artemis Accords are overseen by NASA and the Department of State, and that is a civil exploratory set of agreements about shared principles in space between countries. On the military side, I have a named operation called Operation OLYMPIC DEFENDER, which includes seven countries, which is the United States plus the Five Eyes Nations, Germany, and France, where we cooperate in space together to understand what is happening there.

Senator KING. Those relationships with other countries are important to the execution of your mission. Is that correct?

General WHITING. They are, Senator.

Senator KING. A question that I have not been able to get a clear answer on is what is the concept of the Golden Dome? In other words, would it be 1,000 THAAD batteries, or is it conventional missile defense? Is it directed energy? What is the underlying concept of Golden Dome other than to protect the Homeland, which is certainly a worthy goal?

General WHITING. Senator, the Department right now has been going through a series of meetings and working groups to define what that architecture will look like. But in the executive order it lays out that the President is asking the Department to develop a series of capabilities that will protect against these new, modernized threats like hypersonics, maneuvering vehicles, that put the Homeland at risk.

So I think it will be a layered system that will have to account for all of those threats, at multiple phases of the lifecycle of the missile.

Senator KING. Well, that is the mission. I understand. But I take it we are some distance away from the operational concept of what it will consist of.

A very specific question. Both of you rely heavily on Kwajalein Atoll for training and testing purposes. My understanding is the infrastructure there is woefully inadequate. Can you speak to an effort to try to upgrade that infrastructure so that atoll can continue to be an important part of our Strategic Deterrence Initiative?

General WHITING. Senator, Kwajalein Atoll is very important for our space mission. I visited there last summer. There are five sensors there that support our mission. We have advocated, with the Department of the Army, for investments there, to make sure that the infrastructure can support those missions, and, in fact, my combatant command is in the process right now of defining exactly what the support requirements are that we need there, so we can put those into our next O plan, to make sure the Army understands exactly what requirements we need. But that is a very important location for us.

If you can just keep the Committee informed of that, of what the need is, whether it is authorities or funding, it could be an important part of our ongoing deliberations. Thank you. Thank you, Madam Chair.

Senator FISCHER. Thank you, Senator King. Senator Rounds, you are recognized.

Senator ROUNDS. Thank you, Madam Chair. First of all, General Whiting and General Cotton, I want to thank you both for your service to our country and for the role that you play in keeping our country safe.

General Whiting, I will begin with you, and I am going to have the same question for General Cotton, as well. How important is it that the use of the electromagnetic spectrum, in particular areas of the lower 3 GHz band and the 7–8 GHz band of the spectrum, be maintained by the Department of Defense? I have asked this of over 24 separate uniformed officers over the last 2 years, and the answer has been consistent. But I wanted to hear it from both of you again today, in terms of the need to have that access for the defense of our country.

Would you, General Whiting, explain, at least, or confirm clearly the need for the Department of Defense to maintain its ability to use that unimpeded, in that particular range of the spectrum, please?

General WHITING. Senator, thank you for the question. I totally agree that those two bands are very important to our mission, in fact, vital. The lower three, or that 3 GHz region, is an area where we have radars and sensors which allow us to detect, track, and engage targets through all weather, and we have a number of capabilities there like the SPY–1 and SPY–6 radars, which are on Navy ships, that can support our mission; the long-range detection radar in Alaska, which is critical for missile defense; the Space Fence and the future Deep Space Advanced Radar concept.

Then in the higher bands that you discussed, the 7 and 8 GHz, that is vital for SATCOM and special missions that we execute there, and we could not do our global wide-band satellite communication mission without that spectrum, sir.

Senator ROUNDS. Thank you, General Whiting. General Cotton, same questions.

General COTTON. Senator, I would echo exactly what my dear friend said in regard to the lower bands. If we loose the ability for early detection, that takes away decision space for decision leaders and decisionmakers in regard to being able to execute operational plans. So when we talk about what it affects in regard to ISR, it is going to be incredibly important.

In the higher bands, part of my UCP is global reach through global strike. The bomber force, as an example, has the ability to traverse all over the world. SATCOM communications are going to be vital for those weapon systems today and in the future.

Senator ROUNDS. Thank you, General. Also, General Cotton, you have mentioned it a little bit already, but with the B–21, there was the decision about we are acquiring 100 of them currently, the number has been debated. Should it be 145? should it be more than that? I have appreciated your indication that you have come around to approximately 145.

Can we talk a little bit about this, I mean, this is the next generation. This is the six-generation aircraft, this platform that is there. Can you talk a little bit, in this open discussion, but I think the American public need to understand just what a platform this is and what it is capable of doing, and once again, in this unclassified environment.

General COTTON. Thank you for that, Senator. When we talk about stealth, there are actually only two platforms on the face of the Earth that has all-stealth capability, and that is the current B–2 Spirit and its next-generation replacement, the B–21. There is no other all-aspect stealth aircraft on the face of the planet. The B–2 is the only one, and the B–21 just will dwarf its capabilities with the advanced technologies that it has.

It will be the predominant bomber for the United States Air Force moving forward, as we move to a two-bomber fleet, which will only be the B–21 and the B–52 and the modified version of that, the B–52J.

So it is incredibly important. It is incredibly lethal, with a stand-in and stand-out capability. So that is why I am a big proponent on constant production that far exceeds 100, to the 145 number, to get us to about 220 with those two platforms.

Senator ROUNDS. I noted that you have had a view that indicated the need to accelerate the B–21 production. Can you explain just a little bit about why we need to accelerate that production?

General COTTON. Sir, as we start to see the legacy systems start to divest, that the fleet has, the Air Force fleet, the B–1s and the B–2s, in particular, I want to make sure that we do not see a large bathtub in the ability of operational platforms that are available to be used.

Senator ROUNDS. We have worn our current weapons platforms out.

General COTTON. We do.

Senator ROUNDS. Thank you. Thank you, Madam Chair.

Senator FISCHER. Thank you, Senator Rounds. Senator Reed, you are recognized.

Senator REED. Thank you, Madam Chairman. General Cotton, as I indicated in my opening remarks, there was an issue regarding the separation of the dual-hatting of the U.S. European Commander, SACEUR. What is your military opinion of the effects this could have, possibly weakening the extended deterrence of your force, affecting your force structure in other ways, and also the potential to accelerate nuclear proliferation? I would note that the front page of the Wall Street Journal has an article titled, "Wary Europe Eyes Own Nuclear Force." Could you comment, please?

General COTTON. Thank you, Ranking Member Reed. I think the relationship that I have as far as my operational plans with General Cavoli, both as the EUCOM Commander and as SACEUR, to your point in your opening, is incredibly important in the execution of operational plans for me, even, in STRATCOM.

As you know, I have a relationship with the United Kingdom. I have a relationship with SACEUR in the relationship of what the DCA aircraft bring to bear, to be able to hold the adversary at risk, and that is done through the lens of currently General Cavoli with the SACEUR hat. That would change a little bit if that commander was not a U.S. commander, in the relationship that I would have.

Now, the relationship that I have with my allies and partners, especially my European allies and partners, is still steadfast, whether it be with the United Kingdom, whether it be with France, or whether it be with the other NATO nations.

Senator REED. Thank you. General Cotton, one other question. The Air Force has proposed a reorganization, which I understand has been put on hold until the new Secretary is confirmed, that would cede much of the operational control of heavy bombers away from Air Force Global Strike Command to new composite wings out of Air Combat Command. In response to this, Section 1631 of the 2025 NDAA stopped this until a report is submitted. It has not yet been received.

How concerned are you about this reorganization impacting your nuclear deterrence mission?

General COTTON. Senator Reed, today I have one belly button in the Department of the Air Force that presents two legs of the triad, and 68 percent of the NC3 capability, to me, as my component, and that is the Commander Air Force Global Strike Command. So as a four-star, the Commander of Air Force Global Strike Command has oversight and has the subject matter experts in the nuclear deterrent field, and he owns the bomber leg, as well as the ICBM leg.

You know, all I ask of the United States Air Force is to ensure that when I have force presentation that I can still look to one person that can give me the answers to readiness, give me the answers to where we are acquisition strategies, gives me the answers to where we are on manpower and help that they might need. Today, I only have to look to Barksdale Air Force Base and talk to the Commander of Global Strike to get that answer.

Senator REED. Thank you. General Whiting, are you concerned about becoming overly reliant upon commercial providers for too many of the Department's missions into space? Do we draw a line? Do we ensure that this is a competitive situation?

General WHITING. Senator Reed, I think the principle we need to apply is balance. For those things that we can go to commercial industry for, we should absolutely leverage that. U.S. commercial space industry is a massive advantage for this Nation, and it is an advantage that has widened over the last several years, and I think will continue to widen.

But there are certain missions where we absolutely need to design and build for ourselves our own capabilities. For example, the space capabilities we provide to support General Cotton for nuclear command and control for SATCOM, those are not capabilities that are easily replicable in the commercial market. So we need to de-

sign those for purpose-built reason so we can assure to General Cotton, to the Secretary, and to the President that they can talk to their nuclear forces when required.

So I think it is a matter of balance, and we need to apply that lens to each mission, sir.

Senator REED. Thank you very much. Gentlemen, thank you for your service. Thank you, Madam Chairman.

Senator FISCHER. Thank you, Senator Reed. Senator Tuberville, you are recognized.

Senator TUBERVILLE. Thank you, Madam Chair. Good morning, men. General Cotton, thanks for your service. Thirty-nine years. I retired after 40 years of coaching. After the first week I was sitting around the house, reading the paper, drinking coffee, and my wife said, "You ain't been here in 40 years. Get you a damn job." So here I am today. So don't think you are going to go home and fish and play golf. But thank you for your service.

Gentlemen, in 2024, the Navy eliminated the lead *Columbia*-class submarine, said it could not be delivered for 12 to 16 months late. GAO also reported that late delivery of the lead submarine could jeopardize its planned availability for operations in 2030, and delays of the class could impact planned transition from *Ohio*-class submarines.

If *Columbia*-class submarines are not available, General, what plans have we taken in that regard to fill the gap?

General COTTON. Thank you for that question, Senator Tuberville, and you are right. Right now we are anticipating a 12- to 16-month delay for the first *Columbia*-class.

What is going to be incredibly important, and I say this constantly, is how do we continue to fortify our legacy systems until we do that. So what the Navy is doing is a project called PIRA, and that is the Pre-Inactivation Restricted Availability—that is what that acronym stands for—in which they will look at up to five boats and figure out which of the five boats they might be able to modernize or do some extended life work to, to make it so we do not lose anything from our legacy systems to counter the delay and create a bathtub in our capabilities on the submarine force.

Senator TUBERVILLE. What is the cost of that? That cost has got to be astronomical, though, right, if we are running late and we have to fill in a gap with that. I mean, have we looked at that, and do we have the funding?

General COTTON. Well, you know, I do not have the numbers before me in regard to what the Navy is doing for the cost of PIRA. I can get that to you. We can probably talk about that and I will have it by closed session. But I think bottom line in that regard, we need to ensure that we keep that capability alive and well. I need to make sure that the tubes that are available on the SSBNs remain the tubes that are available on SSBNs, even if there is a slip to the new system that is supposed to replace it.

So I am trying to make it so we prevent a catastrophic failure in regards of creating a bathtub, in all three legs of the triad, to ensure that does not happen.

Senator TUBERVILLE. Thank you, and again, thank you for your service.

General Whiting, U.S. Space Command's role in missile defense, planning and operational support for Guam, how critical is that? Obviously you have been given that task. Where do we stand on that?

General WHITING. Senator, Guam is a vital location for many of our national defense needs, including for space. Through our Joint Functional Component Command for Integrated Missile Defense we do provide that planning and operational support that you highlight. We are regularly working with INDOPACOM as well as the Missile Defense Agency, the Army, and the Navy to develop that architecture that is being delivered to defend Guam against the missile threats we now see, primarily from China.

Senator TUBERVILLE. Yes, thank you. We are doing a lot of work in Guam. Obviously, an AEGIS system being put on the island as a first line of defense.

Let me ask you, too, about the Golden Dome. The President gave us obviously that referendum that he wants to protect our country with some kind of Golden Dome. Do you have a certain group that works with that within Space Command, or is the entire Space Command working on this together? How does that work?

General WHITING. Sir, it is a whole-of-command effort support a whole-of-Department of Defense effort. So it is certainly within my command, that subordinate command, the Joint Functional Component Command for Integrated Missile Defense has a leading role as well as my J8 Resourcing and Requirements Division. In fact, that J8 Division, we have partnered with NORTHCOM and General Guillot there to co-write requirements document for the Golden Dome for America, and we will be delivering that over the next few months to the Department of Defense.

Senator TUBERVILLE. Thank you. Recently President Trump put me on the Board of Visitors for Air Force Academy. I look forward to coming out and visiting with you all and possibly seeing some of your work. So thanks to both of you for your service. Thank you, General.

Thank you, Madam Chair.

Senator FISCHER. Thank you, Senator Tuberville. Senator Cotton, you are recognized.

Senator COTTON. General Whiting, I want to return to Senator Reed's line of questioning about commercial space launch and any kind of risk it might pose us. You called the commercial space industry a, quote, "massive advantage." I assume you are saying it is a massive advantage against our chief adversaries in this domain, China and Russia?

General WHITING. That is correct, Senator.

Senator COTTON. Can you give us a sense of scale of how big the—well, first off, commercial space launch, to be precise here we are talking about ULA, the United Launch Alliance and SpaceX. Correct?

General WHITING. That has been the providers and now Blue Origin has recently demonstrated New Glenn. Yes, sir.

Senator COTTON. So can you give us a sense of scale of just how massive an advantage we have over, say, China because of ULA and SpaceX?

General WHITING. Yes, Senator, and while I do not have the numbers I can qualitatively describe those. If you go back probably 5 to 10 years, the number of launches we were executing compared to those in China or Russia looked very similar. But over time, the U.S. has massively increased the number of launches, and that equates to what we call "mass to orbit." So that means we are able to put more satellites on orbit, whether for commercial or government purposes, and those are getting cheaper and cheaper per pound, which also gives us more opportunities to leverage space for various missions.

Senator COTTON. So you said 5 to 10 years ago we had roughly equal space launch capacity as China and Russia, but now we have substantially exceeded them, right?

General WHITING. Correct. Yes, Senator.

Senator COTTON. What has been the driver over the last 5 to 10 years of that substantial increase? Is it ULA or is it SpaceX?

General WHITING. Predominantly SpaceX. Yes, sir.

Senator COTTON. So if it wasn't for SpaceX, we might be in this position where we still are at near equivalence to China and Russia in space launch.

General WHITING. They certainly have been innovative and rapidly changed that market. Yes, sir.

Senator COTTON. Thank you. General Cotton, you have testified in the past, as have your predecessors, that China has undertaken a breathtaking buildup of its nuclear arsenal. It used to have what is called "minimal deterrence," a nuclear arsenal just sufficient for a second strike. Obviously now it is moving on to first strike capabilities, whatever its rhetoric is. I think the Department estimates that has doubled its nuclear arsenal since Xi Jinping took power. It is projected to double again by the end of this decade, and maybe even double again by the middle of the next decade.

Could you explain the kind of advantage this might provide China, not just in the nuclear balance of power but also in a conventional conflict, say if China decided to go for the jugular in Taiwan?

General COTTON. Thank you, Senator Cotton. Nice seeing you. I think when we put in perspective where we were just left of probably 2018, and we saw it as a nascent threat, and the breakout that my predecessor announced, you are right. What it does in changing the calculus in our strategy is now we must be prepared for two nuclear peers instead of one. I would garner to say, Senator, included in that is two nuclear peers that have a transactional relationship that has blossomed over the last couple of years, as well.

So as we look at the capabilities that we are seeing in all three legs, you are absolutely right. Having an H–6N with long-range strike capability is not a regional hegemon weapon system. Having land-based ICBMs is not a regional hegemon weapon system. Building out their submarine force and having hypersonic weapons that are dual-use capable and FOB'd is not necessarily seen as a regional hegemon weapon system. So it makes us look at things a little differently, and our strategy has changed to compensate for that.

Senator COTTON. Thank you. I will close on a couple of points. I have made them before. You have agreed with them before. I would love to hear your agreement one more time. Some people say about our nuclear weapons that we spend way too much money on weapons we never use. I respond to them that we actually do not spend that much money on them. We may be spending some money modernizing them now, compared to our total defense expenditures. But more importantly we have used our nuclear weapons every single day, going back 80 years this August, to prevent the kind of war that the world saw twice in 20 years.

Do you agree with that, General Cotton?

General COTTON. I absolutely agree with that, Senator.

Senator COTTON. Thank you. I want to finally add my note of agreement, with our fantastic Chairwoman, Senator Fischer, on what she said about the nuclear-armed sea-launched cruise missile, also known as SLCM-N. The program held on by a thread throughout the Biden era, thanks to congressional support, and I am glad that you acknowledge how important it is, and that if anything, we need to do everything possible to accelerate that capability.

Thank you, gentlemen.

Senator FISCHER. Thank you, Senator Cotton. Senator Kelly, you are recognized.

Senator KELLY. Thank you, Madam Chair. General Cotton, General Whiting, thank you for being here. I want to first touch on Golden Dome, and then I want to save some time for SLCM.

I agree nuclear deterrence keeps us safe, and General Cotton, you mentioned two nuclear peers. One of my biggest concerns is the third one, which is the DPRK. I think it is fair to say that most of the time, with our nuclear peers, we are dealing with rational actors. We hope that is the case. That is the thing, part of nuclear deterrence, that they will act rationally.

I am not so sure that is the case with the DPRK, and they are building more nuclear weapons. They are working on other systems to deliver them, and they can now range into the United States. I believe that is our view as a Nation.

So can you talk a little bit about Golden Dome, and my concern with this is that it could potentially, even though I am not against the idea of a system that can protect the entire United States from incoming ballistic missiles, nuclear armed. At the same time, this could accelerate a growing number. Our adversaries' response to having a missile defense system could be to build more nuclear weapons, and if one or two get through, that is too many. Right now we do have a defensive system to protect us from a rogue actor in launching one ICBM, and my understanding is—and if you could share a little bit, General Cotton, about how effective that system is with the interceptors we have in Alaska and in California.

So could you provide an estimate of how much this would cost and what enhanced capability we would get out of this. Do you feel we can build a system that is not penetrable?

General COTTON. Well, thank you, Senator Kelly. I do not want to get out of my lane because NORTHCOM, General Guillot, is the one that is undertaking that role. My responsibility, from Golden Dome, is twofold in accordance with the EO, and mine is to make

sure that I can assure that a second strike capability for the United States remains, and how do we ensure that.

As far as the reliability of the ground-based interceptors piece, once again I do not own that platform. That platform belongs to NORTHCOM, and that is probably best for General Guillot to answer that.

I do believe, and we heard my colleague talk about the layered approach that is kind of the essence of Golden Dome for America. I think that is the answer and the key on how that system can be deliverable, moving forward.

Senator KELLY. All right. Thank you. Thank you, General. I do agree. I think it is something we need to look into, and we need to look at a cost-benefit analysis of this and also consider how it would potentially change the nuclear deterrence posture of not only us but China and Russia.

On SLCM-N, I know it was brought up here also, General. One of my concerns here, one of the things that makes us stand out is our submarine force, especially the attack submarines are incredibly effective. To integrate a tactical nuclear missile into a *Virginia*-class sub would take modifications that are significant, and you would have to put the security system that we have in effect for nuclear weapons. My problem, I think, that I have with this is in the Western Pacific this is a capability. Our attack submarine force is incredibly capable, and I think this would be somewhat disruptive. I think that needs to be a consideration before we go down the road of significant modifications to these systems.

If you could just comment briefly on that.

General COTTON. Senator, I think from my perspective a lot of those are TTPs that the Department of the Navy had, and I think they need to pull those out of the cupboard and look to see what those TPPs where when we had TLAM-Ns. I do not know if it would be disruptive, especially now that what we are seeing, especially in the INDOPACOM theater in regard to our allies and partners' ability of letting us have dual-use, nuclear-capable things arrive on their shores, the fact that I can now have B–52s flying to Japan, where I did not before, and on the Korean Peninsula. I think there is work to be done, but I think it can be accomplished.

Senator KELLY. All right. Thank you. Thank you, Madam Chair.

Senator FISCHER. Thank you, Senator Kelly. Senator Banks, you are recognized.

Senator BANKS. Thank you, Madam Chair, and thank you to both of you for being here today. General Cotton, thank you for your service. You are a hero. What you have done over the last 3 years is remarkable, and it has been an honor to work with you on the House Armed Services Committee and now again on the Senate Armed Services Committee.

As we have talked about before, SLCM-N is meant to deter China and would be launched from attack submarines. SLCM-N is needed to help address capability and escalation management gaps stemming from the rapid growth of China and Russia's theater-range nuclear systems.

General, do you agree with the 2018 Nuclear Posture Review that validated the need for SLCM-Ns, and if so, what does this need to still stand?

General COTTON. I do agree, Senator, and thank you for the comments that you made. What was said in 2018 still holds true today, I think even more so. When I talk about being able to give a geographic combatant commander the ability to also hold an adversary in their region at risk, you can now see that what you are seeing in this weapon system is more than just a strategic weapon. It now can be a regional weapon and a regional deterrence, as well, for my fellow combatant commanders that hold the regions of responsibility.

Senator BANKS. What do we need to do to remain committed to it?

General COTTON. The program of record has been established. We just need to make sure we continue to pump the well, to ensure that they move out. As the Chairwoman said, if we can get things to the left, I would gladly accept being able to get the articles quicker than later.

Senator BANKS. Got it. Fiscal year 2024 NDAA directed the Navy and the NNSA to develop and deploy an operational SLCM-N no later than 2034. Do you believe that we should still have SLCM-N no later than 2034?

General COTTON. I would love to move that to the left, Senator.

Senator BANKS. Got it. General Whiting, the President's Executive Order to establish the Golden Dome for America stresses the need for both weapons to shoot down enemy missiles and the satellites to track them. The EO called for the, quote, "acceleration of the deployment of the hypersonic and ballistic tracking sensor layer."

If we are going to have an effective Golden Dome for the U.S. Homeland, how important is it that we expand our fleet of ballistic and hypersonic missile tracking satellites and space-based sensors?

General WHITING. Thank you for the question, Senator. For the modern threats that we need to track, we will only be able to do that from space, and we need to be able to maintain custody of those threats, not only when they are in the boost phase, when the rockets are burning very hot and we can track them with our infrared satellites, but then also when they are coasting, so that we can, again, maintain custody to engage at the various layers. So it is absolutely vital, Senator.

Senator BANKS. Do you agree with President Trump that we need to rapidly accelerate HBTSS so that we can have the sensors in space that we need to target incoming threats?

General WHITING. I do, Senator. Those threats are real today, those more advanced threats, and our current systems are optimized against traditional ballistic missiles, not against the variants that we are seeing fielded today.

Senator BANKS. General Cotton, China leads the world in hypersonics and has hundreds of long-range hypersonic missiles. As you know, China shocked the world 4 years ago when its hypersonic vehicle orbited the entire Earth before landing. The United States has still not fielded a functional hypersonic weapon. Naval Surface Warfare Center Crane is a proven leader in hypersonics, as you and I have talked about many times before. How important is increased investment in hypersonics if we are going to regain our military edge over China?

General COTTON. Senator, it is very important, and the work that I have seen done by Crane has been extraordinary for the Department of the Navy. I think investments, but actually production, and getting them to the warfighter so they can be implemented and put in our arsenal.

Senator BANKS. Got it, and finally, while we are replacing most of our nuclear arsenal in the next decade or two, we are keeping the B–52 bombers around well into mid-century. How critical is the B–52 program if we are going to keep those planes in the skies for decades to come?

General COTTON. Incredibly important for us, sir. As I mentioned, Senator, we are going to move to a two-platform bomber force for the United States of America. It will be the B–21 and a B–52J. It is incredibly important that we get those 75 birds and modify them with their replacement of their engines, their radars, and——

Senator BANKS. I have got 10 seconds. Can you talk about the advantages of the new B–52 engines over the old engines?

General COTTON. Yes. The Rolls-Royce engines that are right there, being worked in Indiana, gives us incredible increase in range and speed and durability.

Senator BANKS. Thank you. My time has expired.

Senator FISCHER. Thank you, Senator Banks. Senator King and I would like a second round before we had to classified, and I would like to followup on some of Senator Banks' comments about Golden Dome and space-based sensors.

General Whiting, what would be the impacts to the mission effectiveness of SPACECOM were the government to auction off spectrum currently utilized by the Department? Could Golden Dome even take place?

General WHITING. Ma'am, we could not execute Golden Dome without full access to those two spectrums that we discussed earlier, the lower 3 and then the 7 and 8 GHz. We use that lower 3 band, again, through so many of our radars, to be able to track from the ground, and then the 7 and 8 GHz band is so important for our communications and other special missions. I can only see those requirements getting bigger for those spectrums as Golden Dome delivers.

Senator FISCHER. If it was auctioned off, and if it was vacated by the Department, what is the timeframe, not to mention the cost. What is the timeframe in research, development for those new sensors to be even located in another spectrum that would not have the capability that the current spectrum has to even accomplish that. Ten years? Twenty years?

General WHITING. Madam Chairwoman, I do not have a timeline because I think our focus has been not on vacating that but figuring out if there is a way to share that spectrum through dynamic spectrum sharing, and I understand there are technologies there that may make that available. The Department has done some studies on that and laid out a series of conditions that would need to be met if dynamic spectrum sharing can occur, and I endorse that those conditions must be met if we are going to figure out a way to share that spectrum with commercial industry.

Senator FISCHER. Can dynamic sharing take place now?

General WHITING. Ma'am, I am told the technology is close to being ready. I do not know if it is actually ready today, but I would want to verify that, certainly.

Senator FISCHER. You would need to test.

General WHITING. Yes, ma'am. Absolutely.

Senator FISCHER. General Cotton, same question to you. If the government were to auction off spectrum currently utilized by the Department, how would STRATCOM's mission effectiveness be impacted?

General COTTON. It would be impacted, Madam Chair, because what would happen is, to the point that was made by General Whiting, you know, we count on understanding what the threat looks like, being able to see that threat before it actually comes—we call that "left of launch" type of activities—as well as what we are talking about in the higher bands on what is the capacity and capability of my three legs to be able to utilize SATCOM, et cetera. It would absolutely affect us.

Senator FISCHER. Thank you, Sir. Senator King.

Senator KING. Two things. I just wanted to followup on the discussion of hypersonics. I believe that we have missed two critical strategic technologies and are woefully behind, hypersonics and directed energy. These are things that we should have seen coming, and now we are playing catch up. I just want to emphasize not only do we need a hypersonic weapon for deterrent possibilities, but we need hypersonic defense. Those aircraft carriers in the Pacific are sitting ducks for hypersonic missiles coming at them 4,000 to 5,000 miles an hour, 100 feet above the surface of the ocean.

So, hypersonic defense is something I think we need to invest in, as well as the development of a hypersonic offensive capacity in order, again, to provide a deterrent. General Cotton, would you agree?

General COTTON. I do agree with that statement, Senator.

Senator KING. The other thing that I wanted to mention, it has sort of become conventional wisdom here that we are going from one near-peer adversary to two. I believe we are going from one near-peer adversary to three and a half because of, as I think you touched upon this, the growing cooperation between China and Russia. Then you put in Iran, which has also become a contributor to Russia's war machine, as well as North Korea, which is also contributing to Russia's efforts in Ukraine.

I think we need to think strategically, not two near-peer adversaries, but the potential of two near-peer adversaries who are working together. That creates its own strategic challenges. General Cotton, what are your thoughts on that?

General COTTON. Senator, you are absolutely right and that is what we are actually doing at STRATCOM today. When we look at, and you are right, I call them third-party influencers. What I mean by that and to your point, I would add, one, that I think is a little different nuance, that is the new relationship that we are seeing that is happening between Russia and the DPRK. So, we are talking about DPRK. We are talking about Iran. We are talking about China, as well as the Russian Federation.

Senator KING. I think we have to assume that in a time of serious conflict it would not be just with one or the other. It could well

and probably would involve all four of those powers that you have mentioned.

General COTTON. That is why I call them the third-party influencers because what they could do is they can be a distraction from the main effort that could be launched by any one of those that we had mentioned.

Senator KING. General Whiting, your thoughts on that new strategic reality?

General WHITING. Senator, we watch those same four countries that General Cotton just mentioned, and their bilateral relationships with each other, and we see increasingly that space is becoming an area where countries with more sophisticated space knowledge, like Russia or China, appear to be willing to tradeoff that space knowledge for something that they want in return, whether that is armaments or some other political agreement. So we are very concerned with that and watching how they are cooperating on space.

Senator KING. I just think that this new relationship needs to be part of our strategic thinking going forward, to inform things like the Nuclear Posture Review and also the fundamental defense strategy.

Thank you very much, gentlemen. Thank you again for your service, and I appreciate having been able to work with you. You are still at it. He is the guy that is leaving. We are going to miss you, General. Thank you.

Senator FISCHER. We have him for a while yet.

With that we will adjourn the open session of this hearing and reconvene down in classified in order to have our classified briefing from you gentlemen. Thank you very much.

This section of the hearing is closed.

[Whereupon, at 10:44 a.m., the Subcommittee adjourned.]

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR ELIZABETH WARREN

GOLDEN DOME

1. Senator WARREN. General Cotton, what is United States Strategic Command's (STRATCOM) estimate or range for the cost of deploying the Iron Dome of America/Golden Dome (Golden Dome) or a similar system across the entire United States? Please describe your methodology for the estimate or the source.

General COTTON. Although USSTRATCOM is directed to support the Golden Dome planning process, we are not leading this effort. Defer to OSD for information regarding the cost of deploying Golden Dome and the methodology for estimating this cost.

2. Senator WARREN. General Cotton, if Congress does not provide significantly more funding, what specific programs would need to be cut or scaled back to fund such a deployment and ensure programs were not duplicative?

General COTTON. Although USSTRATCOM is directed to support the Golden Dome planning process, we are not leading this effort. Defer to OSD for information regarding programmatic decisions.

3. Senator WARREN. General Cotton, given that the Israeli Iron Dome is designed to intercept slow, short-range threats, what is the technical plan to adapt that system into one that can counter more advanced missile threats possessed by America's adversaries?

General COTTON. Although USSTRATCOM is directed to support the Golden Dome planning process, we are not leading this effort. Defer to OSD for information

regarding technical plans to adapt Golden Dome to counter advanced missile threats.

4. Senator WARREN. General Cotton, how much would such adaptations cost?
General COTTON. Although USSTRATCOM is directed to support the Golden Dome planning process, we are not leading this effort. Defer to OSD for information regarding cost estimates for technical plans to adapt Golden Dome to counter advanced missile threats.

5. Senator WARREN. General Cotton, what timeline would be required to field an operational system for the Golden Dome?
General COTTON. Although USSTRATCOM is directed to support the Golden Dome planning process, we are not leading this effort. Defer to OSD for information regarding the timeline required to field Golden Dome.

6. Senator WARREN. General Cotton, in the 1990's, it was determined that space-based missile defense (SDI/"Star Wars") was too technically challenging and prohibitively expensive. What are the greatest technological risks now for pursuing a similar program?
General COTTON. Although USSTRATCOM is directed to support the Golden Dome planning process, we are not leading this effort. Defer to OSD for information regarding technical risks to pursuing Golden Dome.

7. Senator WARREN. General Cotton, former Under Secretary of Defense for Research and Engineering Michael Griffin and former Deputy Under Secretary of Defense for Research and Engineering Lisa Porter, who both served during the first Trump administration, contend that the Missile Defense Agency (MDA) is not structured to lead an effort of this magnitude. Do you agree with their assessment?
General COTTON. Although USSTRATCOM is directed to support the Golden Dome planning process, we are not leading this effort. Defer to OSD for information regarding whether MDA is structured appropriately.

8. Senator WARREN. General Cotton, Griffin and Porter contend that the Golden Dome program management should not be performed within any existing agency. Do you agree, and if so, should a new agency be created to manage this program?
General COTTON. Although USSTRATCOM is directed to support the Golden Dome planning process, we are not leading this effort. Therefore, defer to OSD for information regarding program management efforts for Golden Dome.

9. Senator WARREN. General Cotton, do you believe the Golden Dome would require an entirely new approach to command and control?
General COTTON. Although USSTRATCOM is directed to support the Golden Dome planning process, we are not leading this effort. Defer to OSD for information regarding command and control requirements for Golden Dome.

NUCLEAR MODERNIZATION

10. Senator WARREN. General Cotton, given the costs of deploying and maintaining a new nuclear cruise missile, should this program take precedence over investments in conventional capabilities like shipbuilding that could achieve similar deterrent effects?
General COTTON. Defer to OSD for determination of investment priority for the Department. The Nation's investments for defense should be an integrated and carefully balanced portfolio of nuclear and non-nuclear/conventional capabilities.
The deterrence and assurance effects of capabilities like a Nuclear Sea-Launched Cruise Missile (SLCM-N) and other theater nuclear capabilities are qualitatively different than those of both conventional capabilities and the existing capabilities of the strategic nuclear triad. Investments in SLCM-N and other theater nuclear capabilities are needed to supplement our portfolio and enhance the ability of the Joint Force to deter adversaries, assure allies and partners, and provide integrated options for achieving objectives and managing escalation by providing flexibility to the President.
The need for the SLCM-N does not negate the need for conventional capabilities. A robust set of nuclear and non-nuclear capabilities is vital to successfully concluding conflicts while managing escalation. The demand for tankers, ships, and conventional prompt global strike weapons across Combatant Commands continues to grow. USSTRATCOM continues to advocate for rapid development and fielding of advanced conventional capabilities and is expanding efforts toward Conventional

Nuclear Integration (CNI). The integrated employment of non-kinetic capabilities (e.g., space, cyber, electromagnetic spectrum), combined with conventional and nuclear operations, must be considered through all phases from competition to conflict.

11. Senator WARREN. General Cotton, has STRATCOM evaluated the operational effects that a new nuclear-armed cruise missile would have on the conventional mission?

General COTTON. Defer to OSD for an evaluation of operational effects a new nuclear-armed cruise missile would have on the conventional mission. The Nuclear Employment Strategy of the United States requires integration of non-nuclear capabilities into nuclear planning. In partnership with seven other Combatant Commands, the Joint Staff, Army, Air Force, and Navy, USSTRATCOM continues to expand efforts toward Conventional Nuclear Integration (CNI) with a 2-year Joint CNI Test to develop a concept of operations to update the process for developing CNI options during competition. This effort will further inform both conventional and nuclear requirements processes to support CNI operational requirements and ensure the United States is postured effectively.

12. Senator WARREN. General Cotton, how long could Minuteman III ICBMs (Intercontinental Ballistic Missile), the current ground-based leg of the nuclear triad, stay operational?

General COTTON. Defer to the Air Force for specifics on MMIII sustainment efforts; however, the legacy MMIII ICBM will remain critical to my deterrence and assurance objectives until replaced by the Sentinel. I remain confident the Air Force, with the continued support of Congress, can adequately sustain the MMIII until replaced by the Sentinel program.

13. Senator WARREN. General Cotton, if the Air Force plans to extend Minuteman III to 2050, would the Air Force and lead contractor Northrop Grumman Corp. benefit from additional time to better plan and manage the Sentinel program?

General COTTON. Defer to the Air Force for specifics on Sentinel timing; however, USSTRATCOM will incur additional operational risk the longer MMIII is deployed.

PROGRAM REQUIREMENTS AND OVERSIGHT

14. Senator WARREN. General Cotton and General Whiting, do you agree that any new major defense program should receive an independent cost estimate before Congress funds the program?

General COTTON. Defer to OSD on independent cost estimates for major defense programs. As a Combatant Commander, I expect weapon systems to be delivered ready and capable of providing options to the President.

General WHITING. Cost estimates play a crucial role in the decisionmaking process for major defense programs, ensuring responsible fiscal stewardship and strategic planning. Independent cost estimates provide valuable insight into potential program costs and risks, but I also recognize the expertise and assessments provided by the Services and would add that integrated Independent Technical & Cost Estimates with qualified space professionals are important for space systems. It is important to consider all available cost evaluations to ensure comprehensive and informed budgetary decisions that best serve national security priorities.

15. Senator WARREN. General Cotton and General Whiting, do you agree that a Congressional Budget Office cost estimate of a major defense program would help inform decisionmakers at DOD (Department of Defense) and in Congress on whether a program is worth pursuing?

General COTTON. Defer to OSD on a Congressional Budget Office cost estimate for major defense programs. As a Combatant Commander, I expect weapon systems to be delivered ready and capable of providing options to the President.

General WHITING. We recognize the value of thorough cost assessments in driving informed decisionmaking for major defense programs. Congressional Budget Office cost estimates can provide additional insight that contributes to better acquisition outcomes, ultimately supporting the development of the combatant command capabilities our forces rely upon. At the same time, we acknowledge the expertise and evaluations conducted by the Services, especially for space systems in which accurate cost estimates must be informed with technical input from space experts. A comprehensive approach that incorporates multiple perspectives ensures well-rounded fiscal and strategic planning to meet national defense objectives.

16. Senator WARREN. General Cotton and General Whiting, how does independent technical expertise in areas such as nuclear and space science benefit your command?

General COTTON. Nuclear technical expertise is critical to supporting USSTRATCOM's Unified Command Plan responsibilities. Independent nuclear technical expertise is vital to ensuring the Nation's nuclear capabilities remain safe, secure, effective, and credible.

General WHITING. Independent technical expertise provides U.S. Space Command (USSPACECOM) the opportunity to review and comment on the strengths and weaknesses of relevant capabilities through the lens of Combatant Command responsibilities articulated in the Unified Command Plan. This expertise also enables a holistic assessment of capabilities across all Services and agencies, facilitating the integration of emergent capabilities into wargames, exercises, and modeling. For example, USSPACECOM leveraged John Hopkins University Applied Physics Laboratory on a Nuclear Electric Propulsion / Nuclear Thermal Propulsion space study that included the National Laboratories and DOD Laboratories to inform plans, define quality requirements, and develop concepts to increase the Command's lethality and provide decision flexibility.

ARMS CONTROL

17. Senator WARREN. General Cotton, the U.S. and Russia are no longer engaged in arms control negotiations, and New START (Strategic Arms Reduction Treaty) is set to expire in 2026. What specific risks does STRATCOM foresee if the U.S. enters a world without legally binding arms control agreements?

General COTTON. Absent New START or a similar agreement, Russia would be unconstrained to expand its strategic nuclear forces, potentially adding to its already large arsenal that includes theater-range non-strategic nuclear systems and novel weapons platforms. This, along with the expanding Chinese and North Korean nuclear capabilities and increasing collusion between all three states, exacerbates deterrence challenges and the potential risks of simultaneous or sequential conflict with nuclear-armed states.

18. Senator WARREN. General Cotton, given the historical success of arms control in reducing nuclear arsenals and preventing arms races, do you believe STRATCOM should be focusing on expanding nuclear capabilities rather than strengthening diplomatic engagement with adversaries?

General COTTON. The USSTRATCOM mission is to deter strategic attack through a safe, secure, effective, and credible global combat capability and, when directed, is ready to prevail in conflict. The President assigned USSTRATCOM the responsibilities for strategic deterrence; nuclear operations; nuclear command, control, and communications (NC3) enterprise operations; joint electromagnetic spectrum operations; global strike; and missile threat assessment which together, underpin national security. As such, the command is focusing on modernizing nuclear capabilities (including all three legs of the triad and NC3) while sustaining legacy nuclear systems.

Defer to the State Department on strengthening diplomatic engagements. However, I support verifiable arms control efforts that advance U.S., Allied, and partner security. I stand by to provide my best military advice if asked.

QUESTIONS SUBMITTED BY SENATOR JACKIE ROSEN

NUCLEAR TESTING

19. Senator ROSEN. General Cotton, Nevada has played a critical role in nuclear weapons development, but often at a high cost. From 1951 to 1992, 928 nuclear weapons were detonated in Nevada, causing people and land to be exposed to toxic levels of radiation. That is one of the reasons why I strongly support the mission of the Nevada National Security Site and the Stockpile Stewardship Program, predominantly at the Principle Underground Laboratory for Subcritical Experimentation (PULSE)—an underground laboratory where scientists conduct subcritical experiments to verify the reliability, safety, and effectiveness of our nuclear stockpile. PULSE is undergoing a major construction project that will soon host the most capable weapons radiographic systems in the world. For decades, the national laboratory directors in their annual stockpile reports say that returning to explosive nuclear testing is unnecessary, with over 1,000 subcritical experiments and robust computer modeling providing the data to support those positions. Do you agree with

these data informed assessments that it is unnecessary for the United States to resume explosive nuclear testing?

General COTTON. At this time, there are no identified issues requiring a return to nuclear underground testing. However, the Nation needs to preserve this capability should the need arise.

20. Senator ROSEN. General Cotton, given the ongoing advancements in artificial intelligence (AI) for weapons design, the production of new pits to replace aging ones, and the modernization of PULSE at the Nevada National Security Site (NNSS), how do you assess these initiatives in providing greater certainty about warhead performance, even for new designs, as compared to our current stockpile stewardship?

General COTTON. Defer to the weapons design experts at our national laboratories to provide specifics regarding increases in certainty from ongoing advancements. The Nation must continue to develop and field state-of-the-art non-nuclear test, modeling, simulation and manufacturing capabilities and tools to maintain confidence in our aging stockpile and modernize for the future.

21. Senator ROSEN. General Cotton, what is your assessment of how a resumption of U.S. nuclear testing would be interpreted by other nuclear states, particularly Russia, China, North Korea, Pakistan, and India?

General COTTON. There are too many variables to accurately assess how other nations would interpret or respond if the United States were to resume nuclear testing. The scale, type, location, and timing of a test, as well as how the United States were to communicate the intention or rationale of the test, all have the potential to cause significantly different interpretations or responses. While the circumstances of U.S. testing could be interpreted by nuclear states as justification for restarting their own nuclear test programs, they could also be the impetus for increased calls for an international moratorium or other restrictions on further nuclear testing.

22. Senator ROSEN. General Cotton, do you assess that this would increase the likelihood of nuclear proliferation?

General COTTON. I cannot speculate about other nations' sovereign decisions, which are made based on their own interests and perceptions of the geopolitical environment.

QUESTIONS SUBMITTED BY SENATOR MARK KELLY

GOLDEN DOME

23. Senator KELLY. General Whiting, the Administration is currently pursuing a Golden Dome—which is supposedly analogous to Israel's Iron Dome. To me, this is comparing Apples to Oranges. Stopping ballistic missiles is a different problem set than stopping rockets and mortars. While I don't oppose the idea of a Golden Dome, the cost benefit analysis must make sense before pursuing an astronomically expensive project. General Whiting, SPACECOM (Space Command) is responsible for missile defense operations, which means you would play a critical role in the creation of a Golden Dome. Can you provide an overview on our current missile defense capabilities, and if you were directed to implement a golden dome strategy, can you provide an estimate as to how much that would cost and what enhanced capabilities we would be after?

General WHITING. The current missile defense enterprise is an integrated, layered architecture designed to provide multiple opportunities to detect and defeat incoming threats before they can reach their targets. Our current missile defense capability is divided into three primary areas: interceptors, sensors, and command and control systems. The Unified Command Plan directs USSPACECOM to provide "operational planning and support to trans-regional missile defense" and to operate ground-based and space-based sensors to provide missile warning and missile tracking. U.S. Northern Command (USNORTHCOM) and the other regional combatant commands are responsible for operating the interceptors using command and control systems provided by the Missile Defense Agency.

Pending final direction on Golden Dome implementation, a more comprehensive layered defense approach is needed, which will require investments currently being factored into the President's Budget for fiscal year 2026, development and deployment of capabilities to defeat missile attacks prior to launch; boost-phase and perhaps midcourse intercept from space; non-kinetics; fully integrated command and control, as well as foundational sensor capabilities. USSPACECOM has been ac-

tively advocating for several enhanced capabilities that align with the President's Executive Order, such as the custody layer of the Proliferated Warfighter Space Architecture and space-based interceptors capable of boost-phase intercept. As Golden Dome's architecture is still pre-decisional, and USSPACECOM's role is to define requirements as opposed to acquiring systems, I refer questions related to acquisitions and costs to the DOD.

SPACE INFRASTRUCTURE

24. Senator KELLY. General Whiting, as we continue to advance our capabilities in space, it's clear that space dominance is about much more than just ensuring we can access space. It's about ensuring we have the freedom to operate in space—protecting our assets and maintaining our strategic advantage in an increasingly contested environment. Our space infrastructure needs to be resilient, adaptive, and capable of evolving in response to emerging threats. This includes the ability to not only evade adversarial actions but also reposition, repair, and refit assets in orbit to ensure continuous functionality. General Whiting, given these priorities, I'd like to hear your thoughts on the Space Force's philosophy regarding these capabilities, and what plans you have in place to ensure that the U.S. remains capable of maintaining a strong, flexible, and secure presence in space.

General WHITING. Space dominance is not just about access—it's about maintaining the freedom to maneuver, defending our assets, and preserving our strategic advantage in an increasingly contested domain. Achieving this requires a robust operational framework that ensures resilience and continuity. Recognizing these challenges, USSPACECOM is prioritizing the ability to deploy, regenerate, and reconstitute at scale across all levels of conflict. Therefore, we require a combination of responsive launch capabilities, maneuverability, and in-domain logistics to be provided by the Services to guarantee uninterrupted space effects throughout the duration of a conflict.

To support the Services' responsibility, we are leveraging structured processes that ensure our priorities align with strategic objectives. Through the Integrated Priority List process, we continue to emphasize a balanced mix of Service-developed capabilities. Recognizing our budget resources are finite and must be shrewdly allocated, I would like to highlight the increasing importance of investing in sustained space maneuver to secure our long-term strategic advantage.

NUCLEAR TRIAD

25. Senator KELLY. General Cotton, I share the concerns a lot of folks have about the current modernization efforts of our Nuclear Triad. The Sentinel program faced a cost overrun that resulted in a Nunn-McCurdy violation. You recently stated we need to acquire 145 B–21 raiders, with the current programmed 100 being the bare minimum for readiness. Finally, you stated in an interview that we need to build a greater number of Columbia class ballistic missile submarines If everything is a priority, nothing is a priority. Where do you see the greatest need for modernization in our nuclear triad?

General COTTON. All triad modernization programs of record (PORs) are vital to maintaining nuclear deterrence. For a number of reasons, the Nation chose to delay nuclear modernization over the past several decades and our legacy systems are now well past their intended lives. Each leg of the nuclear triad must be modernized concurrently to ensure we retain a creditable deterrent. Additionally, our legacy triad capabilities must be sustained until the PORs deliver USSTRATCOM warfighting capabilities. USSTRATCOM will continue to accumulate operational risk until all PORs fully deliver.

26. Senator KELLY. General Cotton, while we continue efforts to modernize our nuclear triad, how is STRATCOM strategically deterring our adversaries and ensuring our current arsenal remains relevant?

General COTTON. The nuclear triad remains safe, secure, effective, and credible and ready to execute the mission. USSTRATCOM provides tailored strategies to effectively deter across a spectrum of adversaries, threats, and conflict, and backstop our extended deterrence commitments.

All elements of the triad undergo rigorous inspections and follow consistent testing regimes to ensure existing capabilities remain safe, secure, effective, and credible.

Furthermore, USSTRATCOM continues to assess capacity, capability, and the forces required to support our tailored deterrence strategies to ensure the current arsenal remains relevant.

SPACECOM AND INDUSTRY PARTNERS

27. Senator KELLY. General Whiting, last year I discussed with your predecessor how SpaceX and Starlink temporarily discontinued services of their platforms during the conflict in Ukraine after they took issue with the 'weaponization' of their technologies. SPACECOM was working on an initiative to ensure we wouldn't lose commercial capabilities during crisis or conflict. Can you provide an update on what steps you have taken to ensure we don't lose critical access to commercial capabilities during crisis or conflict?

General WHITING. DOD's 2024 Commercial Space Integration Strategy describes how DOD will ensure access to commercial solutions across the spectrum of conflict: "The Department will use contracts and other agreements as the formal mechanisms to ensure access to commercial solutions across the spectrum of conflict and mission areas. Contracts and other agreements will address the cyber, data, and supply chain security requirements that commercial entities will need to meet to work with the Department. As necessary, contracts will enable prioritization of Department requirements and capability needs over other commercial clients in specific situations."

USSPACECOM supports the DOD Commercial Space Integration Strategy by establishing the security conditions for integration, mitigating risk to commercial space actors inherent in supporting national security space operations. The Strategy states that: "In appropriate circumstances, the use of military force to protect and defend commercial assets could be directed." USSPACECOM stands ready to protect and defend commercial assets from aggression in the space domain if directed to do so. USSPACECOM also mitigates risk to commercial space actors through sharing of threat information. In 2024, our Commercial Integration Cell, which enables sharing of classified threat information with the space companies the U.S. Government most relies on for space services, expanded to 17 commercial mission partners.

We recognize that the DOD must maximize the gains from our innovative commercial partners, while avoiding dependencies that limit decision space. We will continue to seek ways to protect and ensure access to critical capabilities throughout all phases of conflict.

28. Senator KELLY. General Whiting, the complexity and scale of warfare has expanded exponentially over the past decade—how is SPACECOM postured to leverage and capitalize on industry initiatives? How can we ensure critical capabilities get into the hands of the warfighter while the technology is still relevant?

General WHITING. On January 6, 2025, USSPACECOM published our Experimentation Strategy to explore and promote utilization of emerging space domain technologies and innovate in support of all our vital missions, including deterrence. As a part of this drive for a culture of innovation, we also updated the Command's Commercial Integration Strategy, which captures how we will leverage industry initiatives. Through this strategy, we identify and advocate for promising technologies; incorporate and operationalize commercial partners and their capabilities into training and operations; and implement information sharing and protection of commercial capabilities when directed. The ongoing execution of this strategy includes the Commercial Integration Cell and Joint Commercial Operations Cell, as well as our integration of commercial quick reaction capabilities through our own initiatives and via the Services. Inserting these systems into planning, wargaming, and exercising is essential to give our warfighters the opportunity to determine effective and efficient employment before a crisis or conflict.

HYPERSONIC WEAPONS

29. Senator KELLY. General Cotton, as you know, our adversaries continue to develop advanced weapons and capabilities to try to erode our competitive edge. Systems like hypersonic weapons add new complexity and danger to strategic deterrence. In your prepared statement, you referenced the danger posed by nuclear armed hypersonic weapons. The speed and unpredictable flight paths make hypersonic weapons more difficult to detect, track, and can reduce your margin for error and response time. Can you talk about the risks adversary hypersonics pose to your mission of strategic deterrence?

General COTTON. On January 6, 2025, USSPACECOM published our Experimentation Strategy to explore and promote utilization of emerging space domain technologies and innovate in support of all our vital missions, including deterrence. As a part of this drive for a culture of innovation, we also updated the Command's Commercial Integration Strategy, which captures how we will leverage industry initiatives. Through this strategy, we identify and advocate for promising technologies; incorporate and operationalize commercial partners and their capabilities into train-

ing and operations; and implement information sharing and protection of commercial capabilities when directed. The ongoing execution of this strategy includes the Commercial Integration Cell and Joint Commercial Operations Cell, as well as our integration of commercial quick reaction capabilities through our own initiatives and via the Services. Inserting these systems into planning, wargaming, and exercising is essential to give our warfighters the opportunity to determine effective and efficient employment before a crisis or conflict.

30. Senator KELLY. General Cotton, do you think hypersonics are a key aspect of our strategic modernization efforts?

General COTTON. Yes, hypersonic weapons will provide a highly responsive, long-range, non-nuclear capability for distant, defended, and/or time-critical threats when other forces are unavailable, denied access, or not preferred. These weapon systems will provide senior leaders with additional credible strike options to influence all stages of conflict without crossing the nuclear threshold.

31. Senator KELLY. General Whiting, SPACECOM is responsible for missile defense, what is SPACECOM doing to ensure we develop the needed technology to detect and respond to hypersonic threats with the required speed?

General WHITING. Under the current Unified Command Plan, USSPACECOM is responsible for transregional missile defense planning, operations support, and sensor management. We work closely with USNORTHCOM, U.S. Indo-Pacific Command, and other regional Combatant Commands, who are responsible for missile defense operations employing systems supplied by the Missile Defense Agency.

To effectively address the hypersonic threat, we are advancing operational concepts through the Golden Dome effort, advocating that the Services provide key technologies that stay ahead of emerging threats. Additionally, USSPACECOM is collaborating with USNORTHCOM to develop an Initial Capabilities Document for Golden Dome, identifying essential requirements to track and respond to hypersonic threats with the necessary speed and precision.

Through our requirements processes, we continue to advocate for the accelerated integration of enhanced capabilities, including Hypersonic and Ballistic Tracking Space Sensor, the custody layer within the Proliferated Warfighter Space Architecture, space-based interceptors for boost-phase engagement, pre-launch and boost-phase missile defeat capabilities, and advancements in non-kinetic defense measures. These efforts align with the President's Executive Order on Golden Dome for America, ensuring our missile defense architecture remains agile and responsive to the evolving threat landscape.

THE DEPARTMENT OF DEFENSE MISSILE DEFENSE ACTIVITIES IN REVIEW OF THE DEFENSE AUTHORIZATION REQUEST FOR FISCAL YEAR 2026 AND THE FUTURE YEARS DEFENSE PROGRAM

TUESDAY, MAY 13, 2025

UNITED STATES SENATE,
SUBCOMMITTEE ON STRATEGIC FORCES,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

DEPARTMENT OF DEFENSE MISSILE DEFENSE ACTIVITIES

The Subcommittee met, pursuant to notice, at 4:45 p.m., in room SR–232A, Russell Senate Office Building, Senator Deb Fischer (Chairwoman of the Subcommittee) presiding.

Subcommittee Members present: Senators Fischer, Tuberville, King, and Kelly.

OPENING STATEMENT OF SENATOR DEB FISCHER

Senator FISCHER. I call this hearing to order. I would like to thank the witnesses for being here today.

This Subcommittee has long worked on a bipartisan basis to strengthen and improve our national integrated air and missile defense architecture. Our adversaries continue to improve and diversify their ability to hold the Homeland at risk, including through ballistic, hypersonic, and cruise missiles. I remain deeply concerned that the status quo will not suffice in the coming decades, and I look forward to hearing from each of our witnesses about their work on the Department's various missile defense activities.

General Guillot, as the Commander of United States Northern Command (NORTHCOM) you are ultimately responsible for the defense of our Homeland. I look forward to hearing how NORTHCOM is working to enhance domain awareness to provide a common picture of the operational environment.

Ms. Yaffe, as you stated in your written testimony, missile defense and the space domain are intrinsically linked. I look forward to hearing your views on the evolution of missile defense and how space-based systems can continue to play an important role going forward.

Lieutenant General Collins, I understand the Missile Defense Agency (MDA) will retain its key role in developing, testing, and

integrating many of the technologies that comprise our missile defense system, and I look forward to hearing how we can expect to expand on these efforts in the coming fiscal year.

Finally, I would like to welcome Lieutenant General Rasch, in his capacity as the Executive Officer of the Guam Defense System Joint Program Office. I look forward to hearing from you about the progress being made to expand and improve the integrated air and missile defense of Guam, which will protect over 160,000 American citizens living on Guam.

I understand that we are still waiting for details of the fiscal year 2026 President's Budget Request to be released, and that the President is in the final stages of making key decisions about the Golden Dome system. While this means that follow-on conversations will be necessary once the Administration provides us those details, I still expect a robust conversation this afternoon on the future of missile defense. Thank you again.

Senator King, would you like to make some opening remarks please.

STATEMENT OF SENATOR ANGUS S. KING, JR.

Senator KING. Thank you very much, Madam Co-Chair. Can I say that?

Senator FISCHER. Yes.

Senator KING. Thank you. This Subcommittee does work very strongly on a bipartisan basis. We look forward to your testimony. Very important hearing today with regard to a very important subject.

Ms. Yaffe, I don't expect you to answer these questions now but I am giving you a preview. One of the questions is, in light of the multiplicity of threats now, whether it is standoff cruise missiles, Intercontinental Ballistic Missiles (ICBMs), sea-launched missiles, space-based weapons, is missile defense feasible? In other words, is it technologically feasible if we face a serious attack from an adversary that has not several dozen missiles but several thousand.

Mr. Guillot—or General, I am sorry—one of the questions I am interested in is the importance of sensors. This discussion is often about missiles, but it is also about knowing what is going on, and particularly in your AOR I think there are some serious questions that bear discussion about our situational awareness.

Finally, General Collins, I am interested in what is Golden Dome. In other words, what is the plan? What does it consist of? I did a little artificial intelligence (AI) research this morning and found out Israel is exactly the same size as New Jersey. So having a missile defense system in a limited space, also that defends against pretty small caliber munitions from the terrorists in the region, obviously more serious from Iran, but whether that concept can be transferred to the continental United States is a question I will be interested in.

So I look forward to all of your testimony. Very important hearing, and I appreciate all the work that you do and the service you provide to the country.

Thank you, Madam Chair.

Senator FISCHER. Thank you, Senator King.

Now I would like to begin with statements from each member. Who is going first at this point? Ms. Yaffe?

STATEMENT OF ANDREA YAFFE, ACTING PRINCIPAL DEPUTY ASSISTANT SECRETARY OF DEFENSE FOR SPACE POLICY, DEPARTMENT OF DEFENSE

Ms. YAFFE. Thank you. I am happy to start out to provide the policy perspective.

Chair Fischer, Ranking Member King, and distinguished Members of the Committee, thank you for inviting me to testify on the Department of Defense's missile defense posture, on behalf of the Office of the Secretary of Defense. I am grateful to appear alongside my distinguished colleagues.

Missile defenses are a vital element of our strategic force posture, both as a means of deterrence as well as defending the U.S. Homeland and security interests abroad. As we see nearly every day in conflicts across the world, offensive missile capabilities are now a central feature of modern warfare and routinely deployed to coerce and intimidate opponents, inflict tactical damage, and carry out strategic campaigns.

Our adversaries are investing in the next generation of offensive capabilities to hold the United States Homeland at risk, coerce our allies and partners, and threaten our deployed forces.

To counter these growing threats we need next-generation missile defeat and missile defense architectures that can complement our existing nuclear and conventional offensive capabilities. The President has mandated that the United States will develop and field a next-generation missile defense shield to provide for the common defense of our citizens and the Nation and deter, defend against, and defeat any foreign aerial attack on the Homeland. We will also guarantee our secure second strike capability. This broad mission set is the task before us today.

Missile threats pose a substantial and growing risk to the American people, U.S. national interests, and our allies and partners. The growing cooperation and potential for more coordinated action among China, Russia, North Korea, and Iran is reflecting a shared interest in undermining United States interests globally.

We also see these countries working together to advance their respective interests. Russia has provided technical and economic assistance to North Korea and Iran in return for thousands of munitions, attack drones, and ballistic missiles. Russia has employed North Korean missiles in Ukraine, resulting in improvements in their accuracy and destructive capability.

Department of Defense (DOD) must content with adversaries possessing a range of sophisticated technologies, including advanced cruise and ballistic missiles and maneuverable Hypersonic Glide Vehicles (HGVs), as well as lower-tier threats like unmanned aircraft systems from both State and non-State actors. These capabilities continue to evolve and include a wide range of platforms, speeds, distances, and attack vectors that are easily concealed and evasive.

This is where the value of missile defense, a core component of deterrence by denial, comes in. Robust missile defense capabilities raise the threshold for conflict and introduce uncertainty and com-

plexity into attack planning, thereby undermining an adversary's confidence that an attack will be successful. The greater the cumulative challenges for an adversary, the greater the likelihood of avoiding an attack in the first place. If deterrence fails and an attack does occur, missile defenses limit the damage and assure the means of effective responses.

Moreover, missile defenses provide time and space for the President to decide how to respond most effectively. The financial outlays of missile defense and missile defeat today more than offset the exponentially greater costs that would be incurred by the lack of defenses in a potential conflict tomorrow.

Missile defense systems also contribute to deterrence by reinforcing our diplomatic and security posture while reassuring allies and partners. Should deterrence fail, the United States, our allies, and partners would need robust missile defense and defeat options, not only to defend and protect our interests but also to manage escalation. Integration with our allies and partners improves our all-domain awareness, redundancy, and shot deconfliction. The deterrence by denial contributions to missile defense continue to serve as a complement to the cost imposition strategies offered by our conventional and nuclear forces. Together they give our decision-makers time and credible options to deter aggression, assure lethality, protect the American people from harm, and respond to attacks if deterrence fails.

The Department of Defense remains committed to making the necessary investments in our strategic posture to deter our adversaries and, if deterrence fails, to prevail in conflict. The missile defense and defeat mission requires sufficient and consistent funding and support.

Thank you for your dedication to our mission and our servicemembers and for the opportunity to testify to you today alongside my colleagues. I look forward to answering your questions.

[The prepared statement of Ms. Yaffe follows:]

PREPARED STATEMENT BY MS. ANDREA YAFFE

INTRODUCTION

Chairman Fischer, Ranking Member King, and distinguished members of the Committee: Thank you for inviting me to testify on the Department of Defense's missile defense posture. I am grateful to appear alongside my distinguished colleagues. The Assistant Secretary of Defense (ASD) for Space Policy is the principal civilian advisor to the Secretary of Defense, the Deputy Secretary of Defense, and the Under Secretary of Defense for Policy on all missile defense and defeat activities. It is my privilege and honor to oversee this office pending the nomination and confirmation of a new ASD for Space Policy. For this testimony, I will review how air and missile threats have evolved over the last year and provide an update on our missile defense policy, strategy, and programs to meet these challenges.

Missile defenses are a vital element of our strategic force posture, both as a means of deterrence as well as defending the U.S. Homeland and security interests abroad. As we see nearly every day in conflicts across the world, offensive missile capabilities are now a central feature of modern warfare. China, the Democratic People's Republic of Korea (DPRK), Russia, and Iran now routinely deploy advanced missile systems to coerce and intimidate opponents, inflict tactical damage, and carry-out strategic campaigns.

Our adversaries are investing in the next generation of offensive capabilities to hold the United States Homeland at risk, coerce our allies and partners, and threaten our deployed forces. China, Russia, and the DPRK, are fielding more advanced

missiles with greater ranges and in larger numbers to provide the means for strategic-level attack against the Homeland, including nuclear and conventional options. These adversaries are rapidly modernizing, expanding, and diversifying their missile forces, incorporating technological advances into warheads, delivery systems of all types, and supporting command and control systems. Iran, meanwhile, has the capability to strike targets throughout the Middle East and continues to arm its proxies in the region. The President's Golden Dome for America Executive Order underscores this point: "The threat of attack by ballistic, hypersonic, and cruise missiles, and other advanced aerial attacks, remains the most catastrophic threat facing the United States."

To counter these growing threats, we need next generation missile defeat and missile defense architectures that can complement our existing nuclear and conventional offensive capabilities. The President has mandated that the United States will develop and field a next generation missile defense shield to provide for the common defense of our citizens and the Nation, and deter, defend against, and defeat any foreign aerial attack on the Homeland. We will also guarantee our secure second-strike capability. This broad mission set is the task before us today.

Missile defense and the space domain are intrinsically linked as key elements of the necessary solution. Proliferated space-based sensors offer an optimal perspective for missile warning and tracking, and efforts in the space domain will be critical for the future technological growth of missile defense. The other essential requirement for countering missile attacks is to develop and deploy capabilities to defeat them prior to launch.

SECURITY ENVIRONMENT

Missile threats pose a substantial and growing risk to the American people, U.S. national interests, and our allies and partners. The growing cooperation and potential for more coordinated action among China, Russia, the DPRK, and Iran is displaying a shared interest in undermining United States interests globally.

China

China is modernizing its missile forces to enhance its strategic deterrence capabilities and to deter and counter third-party intervention in regional conflicts. Today, China maintains a diverse arsenal of intercontinental-range forces, theater-range road-mobile ballistic missile systems, strategic hypersonic glide vehicles (HGVs) capable of carrying nuclear warheads, and sea-launched ballistic missile submarines that can hold the United States and our allies and partners at risk. China is expanding its nuclear arsenal at extraordinary speed, developing a nuclear triad of land-based and sea-based missiles and a nuclear-capable strategic bomber. The United States Intelligence Community assesses that China will have more than 1,000 operational nuclear warheads by 2030, many of which will be deployed at higher readiness levels. We remain very concerned about the lack of transparency from China regarding these developments.

China is also developing more survivable intercontinental ballistic missiles (ICBMs) to improve its nuclear-capable missile forces. Its ICBM arsenal currently consists of approximately 400 missiles, including fixed and mobile launchers capable of launching unitary and multiple independently targetable reentry vehicles. China's development of advanced nuclear delivery systems, such as a strategic HGV and a fractional orbital bombardment system, creates new challenges for deterrence.

China views the possession of advanced conventional missile systems as a means to coerce neighbors and subvert U.S. efforts in the region. China possesses a variety of conventional mobile ground-launched, short-range, medium-range, and intermediate-range ballistic missiles and ground-launched cruise missiles to enable long-range precision strikes within the First and Second Island Chains. This includes conventionally armed anti-ship ballistic missile variants and multi-role missiles for targeting aircraft carriers and other ships in the Western Pacific.

Beijing is also developing and testing more advanced theater-range missiles, including capabilities and methods to counter adversary ballistic missile defense (BMD) systems. This includes the DF–17 and longer-ranged DF–27 that have HGV payloads designed to evade early warning radars and associated defenses. More alarmingly, China is exploring the development of conventionally armed intercontinental range missile systems. If developed and fielded, these capabilities would enable China to strike all 50 states, the District of Columbia, and United States territories with conventional missiles. The introduction of intercontinental conventional capabilities has the potential to introduce uncertainty regarding whether an attack has a conventional or nuclear payload, thereby risking escalation to a nuclear exchange. In addition to missile development, China is making significant advancements in Command, Control, Computing, Communications, Cyber, Intelligence, Sur-

veillance, Reconnaissance, and Targeting (C5ISRT) capabilities, such as a space-enabled targeting network, as well as counter C5ISRT capabilities, such as ground-based and space-based counterspace weapons, to strengthen their kill webs, enable the successful delivery of their long-range precision weapons, and, ultimately, hold U.S. and allied and partner forces at risk.

Russia

Russia continues to field ballistic, cruise, and hypersonic missiles and is using these systems extensively in Ukraine. It has employed air-launched, ground-launched, and sea-launched systems, some of which could also deliver a nuclear warhead. In addition, Russia is pursuing novel and destabilizing nuclear systems that are additive to its existing capabilities, and are designed to hold the United States Homeland, allies, and partners at risk.

Additionally, the direct-ascent anti-satellite missiles and on-orbit counterspace capabilities being developed by China and Russia threaten the space-based sensors critical for our early warning and missile defense architecture. These threats underscore the need to create a shared international understanding what constitutes responsible operational rules for safety and stability in space.

DPRK and Iran

The DPRK and Iran also have missile capabilities that threaten our territory, forces, and allies. The DPRK continues to develop its ICBM forces with frequent long-range tests of new systems, including the test last October of a new, more powerful solid-fueled missile capable of reaching most of the continental United States. The DPRK's conventional missile forces, including short and medium-range ballistic missiles, and cruise missiles, remain a substantial threat to the DPRK's neighbors and to U.S. territory and forces in the region.

Iran possesses the largest missile program in the Middle East and twice demonstrated its willingness and ability to use this force last year with coordinated air and ballistic missile strikes of more than a thousand kilometers against Israel. Iran also remains the world's biggest proliferator of ballistic and cruise missiles and unmanned aircraft attack systems and related technologies to State and non-State entities. The recipients of Iran's support include Hamas in Gaza, the Houthis in Yemen, and Hezbollah in Lebanon. Like Iran, these groups have demonstrated a willingness to use these weapons—whether against Israel or commercial shipping in the Red Sea.

Adversary Cooperation

We also see these countries working together to advance their respective interests. Russia has provided technical and economic assistance to the DPRK and Iran in return for thousands of munitions, attack drones, and ballistic missiles. Russia has employed DPRK missiles in Ukraine, resulting in improvements in their accuracy and destructive capability. The significant growth in the DPRK-Russia strategic partnership merits close attention because the two countries increasingly share resources, knowledge, and technology to bolster and expand their air and missile forces.

Adversary Missile Defense Capabilities

China and Russia possess the largest integrated air and missile defense forces in the world, dedicated to protecting their respective homelands and forces from air and missile attack. China is modernizing its ballistic missile defense capabilities, fielding the indigenous CH-AB–02 (HQ–19) and developing kinetic-kill vehicle technology to field a mid-course interceptor. This mid-course interceptor will form the upper layer of a multi-tiered missile defense. China tested a land-based, mid-course interceptor on February 4, 2021. Russia, meanwhile, has maintained a missile defense system to defend Moscow since the 1970's. It currently consists of about 68 nuclear-armed interceptors. Russia is also developing the S–500, which has some capability against ballistic missiles, and operates other credible air and missile defenses to defend critical assets and fielded forces.

MISSILE DEFENSE STRATEGY AND POSTURE

DOD must contend with adversaries possessing a range of sophisticated technologies, including advanced cruise and ballistic missiles and maneuverable HGVs, as well as lower-tier threats, like unmanned aircraft system (UAS), from both State and non-State actors. These capabilities continue to evolve and include a wide range of platforms, speeds, distances, and attack vectors that are easily concealed and evasive.

This is where the value of missile defense—a core component of deterrence-by-denial—comes in. Robust missile defense capabilities raise the threshold for conflict and introduce uncertainty and complexity into attack planning, thereby undermining an adversary's confidence that an attack will be successful. The greater the cumulative challenges for an adversary, the greater the likelihood of avoiding an attack in the first place. If deterrence fails and an attack does occur, missile defenses limit the damage and assure the means of effective responses. Moreover, missile defenses provide time and space for the President to decide how to respond most effectively. The financial outlays of missile defense and missile defeat today more than offset the exponentially greater cost that would be incurred by the lack of defenses in a potential conflict tomorrow. This premise is at the core of the Golden Dome executive order.

Missile defense systems also contribute to deterrence by reinforcing our diplomatic and security posture while reassuring allies and partners. Should deterrence fail, the United States, our allies, and partners would need robust missile defense and defeat options not only to defend and protect our interests, but also to manage escalation. Integration with our allies and partners improves our all-domain awareness, redundancy, and shot deconfliction, and we are working to overcome barriers to data and cost sharing.

Last year, we witnessed this scenario unfold on multiple occasions. Iran's large-scale ballistic, cruise missile, and UAS attack against Israel in April and follow-on massive ballistic missile attack in October 2024 represented one of the largest concentrated barrages ever conducted by any nation. The successful coalition missile defense and missile defeat responses against both attacks created opportunities for strategic pause, allowing Israel to calibrate its next moves rather than rush into a counterattack with potential unintended escalation.

The deterrence by denial contributions to missile defense continue to serve as a complement to the cost imposition strategies offered by our conventional and nuclear forces. Together they give our decisionmakers time and credible options to deter aggression, assure lethality, and protect the American people from harm and respond to attacks if deterrence fails.

Space-based capabilities and assurance of nuclear second-strike capabilities are also part of the direction for a Golden Dome for America. The executive order calls for the ground-breaking development and deployment of a next generation missile defense shield capable of protecting the American people against a catastrophic missile attack. Golden Dome is a top priority for the Department and will include the development of cutting-edge domain awareness systems, kinetic and non-kinetic missile defeat capabilities in the space and cyberspace domains, and advanced command, control, and battle management systems to integrate and augment traditional U.S. missile defense capabilities.

Burden sharing with allies and partners is also a priority in the missile defense arena. Japan's co-development of the Glide Phase Interceptor with us is a prime example, as is their acquisition of Aegis system equipped vessels and SM–6 interceptors. Data sharing in the Indo-Pacific region is also a crucial initiative, with efforts already in place with Japan and South Korea, and discussions underway with Australia as well. Meanwhile, we are co-developing the Arrow 4 and co-producing Iron Dome, David's Sling, and Arrow 3 BMD systems with Israel, and Saudi Arabia is acquiring seven THAAD batteries. Closer, to home, Canada is acquiring over-the-horizon radars that will be helpful for the defense of North America. Finally, in Europe, Germany, Norway, Poland, Romania, Sweden, and Switzerland are acquiring Patriot batteries and interceptors. These allied investments are a start, but not sufficient to meet the growing threats that we collectively face today. As the Secretary has stated many times, greater burden-sharing is required, and we continue to emphasize this point in our discussions with our allies and partners.

CONCLUSION

The Department of Defense remains committed to making the necessary investments in our strategic posture to deter our adversaries and, if deterrence fails, prevail in conflict. The missile defense and defeat mission requires sufficient and consistent funding and support. Thank you for your dedication to our mission and our servicemembers, and for the opportunity to testify to you today alongside my distinguished colleagues. I look forward to answering your questions.

Senator FISCHER. Thank you very much. General Guillot, welcome.

STATEMENT OF GENERAL GREGORY M. GUILLOT, USAF, COMMANDER, UNITED STATES NORTHERN COMMAND AND NORTH AMERICAN AEROSPACE DEFENSE COMMAND

General GUILLOT. Chair Fischer, Ranking Member King, and distinguished Members of the Subcommittee, thank you for holding this important hearing. North American Aerospace Defense Command and United States Northern Command have critical roles in defending The Homeland from missile attack, and your support remains vital to our success.

I would like to start by recognizing the tremendous work being done by Lieutenant General Collins, Acting Principle Deputy Assistant Secretary of Defense (ASD) Yaffe, and Lieutenant General Rasch. Northern American Aerospace Defense Command (NORAD) and NORTHCOM are fortunate to have such committed partners in our shared no-fail mission.

Defending the United States from missile threats remains a top command priority. That mission is more important than ever as global competitors continue their rapid development and fielding of advanced missile capabilities and delivery platforms along with increased cooperation and technology sharing.

To counter these growing challenges, NORAD and NORTHCOM rely on realistic planning, on-time investments based on specific threats, and forward-looking policies that ensure the command's ability to detect, track, and defeat potential threats in all domains.

To ensure our ability to defend against missile attacks, NORAD and NORTHCOM require a layered, domain awareness network, from seabed to space, to detect and track threats to North America. That sensing network is vital to today's ballistic and cruise missile defense missions and to the Golden Dome concept because we can't defeat what we can't see.

Alongside improved domain awareness we must also improve our capability and capacity to defeat advanced missile threats. The Next-Generation Interceptor is vital to countering North Korea's growing ICBM capability, and innovation investment in advanced defeat mechanisms, which could include directed energy and boost-phase intercept will be crucial against cruise missiles, hypersonics, and other advanced threats.

There are significant challenges ahead of us, but NORAD and NORTHCOM stand ready to deter aggression and defeat threats to our Nation.

Again, thank to this Subcommittee and my fellow witnesses for your continued support, and I look forward to your questions. We have the watch.

[The prepared statement of General Guillot follows:]

PREPARED STATEMENT BY GENERAL GREGORY M. GUILLOT

Chairwoman Fischer, Ranking Member King, and distinguished members of the Sub-Committee: I am honored to appear today and to represent the men and women of United States Northern Command (USNORTHCOM) and North American Aerospace Defense Command (NORAD). Both commands continue to defend North America through what is arguably the most complicated and rapidly evolving operational environment we have seen. The USNORTHCOM and NORAD operational environment remains diverse and dynamic, ranging from persistent competitor activity in the vicinity of North America to major natural disasters that have impacted millions of Americans. I am proud to report that the service members and civilian

Federal employees at the heart of every USNORTHCOM and NORAD endeavor have risen to each challenge as they stand their unending watch over our homelands.

USNORTHCOM and NORAD are distinct commands linked by history, collaboration, and a shared commitment to defending North America. USNORTHCOM was established in 2002 as the U.S. geographic combatant command responsible for homeland defense, security cooperation with allies and partners in the command's area of responsibility, and Defense Support of Civil Authorities (DSCA) in the continental United States and Alaska. USNORTHCOM is responsible for defending the United States—to include Hawaii and Alaska—from ballistic missile attacks, while the Commander of USNORTHCOM is also designated by the Unified Command Plan as the Department of Defense Advocate for Arctic Capabilities. Finally, in accordance with Presidential Executive Orders issued on 20 January, 2025, USNORTHCOM is rapidly integrating requested military personnel and assets to support the Department of Homeland Security (DHS) and U.S. Customs & Border Protection (USCBP) along the southern border, employing unique military capabilities in all domains, and developing plans for establishing territorial integrity along the southern border. USNORTHCOM's current mission in support of USCBP is to seal the borders and repel all forms of invasion including mass migration, narcotics trafficking, human smuggling and trafficking, and other criminal activities.

Established in 1958 to counter the threat of Soviet long-range bombers, NORAD is the bi-national United States and Canadian command responsible for aerospace warning, aerospace control, and maritime warning for North America. For nearly 67 years, the United States and Canadian personnel assigned to NORAD have worked side-by-side in a shared commitment to continental defense. Forged through operational experience and a common vision, NORAD consistently demonstrates world-class professional standards while executing its critical defense mission 24 hours a day. Today, NORAD remains the world's only bi-national command, safeguarding the United States and Canada while routinely demonstrating seamless interoperability and operational excellence that our competitors can only hope to match.

Together, USNORTHCOM and NORAD's experience, expertise, and dedication to homeland defense are more critical today than ever. Following years of steady investment, our strategic competitors have the means to overcome U.S. advantages provided by our favorable geography and advanced technology. Today, our competitors have the capability and capacity to threaten all of North America with a range of advanced nuclear, conventional, and non-kinetic systems while employing disruptive grey-zone, cyber, and information operations against the United States and our international partners. As part of that effort, competitors have formed strategic relationships that increase their collective ability to challenge U.S. and allied interests around the world with growing disregard of international norms or the sovereignty of nations that challenge their expansionist ambitions. Meanwhile, unprecedented flows of illicit drugs and human traffic across the U.S. southern border have created a crisis that undermines national security and the safety of citizens and communities across the country.

The dynamic operational environment and evolving threats to North America require USNORTHCOM and NORAD to execute new missions on a moment's notice without sacrificing ongoing operations and future planning. USNORTHCOM and NORAD are fortunate to draw upon decades of shared history and lessons learned to shape the commands' plans and operations, and defending the homelands in the coming years will require forward thinking, advanced capabilities, and a professional workforce with the experience and technical knowledge necessary to plan, resource, and execute the commands' crucial missions in tremendously demanding conditions.

The Homeland defense enterprise will continue to rely on realistic planning, targeted investment, and forward-looking policies that ensure the Commands' ability to detect, track, and defeat potential threats in all domains. USNORTHCOM and NORAD are working in close synchronization with each of the commands' interagency, international, and DOD partners to improve shared all-domain awareness, interoperability, and the defeat mechanisms required for a layered all-domain defense capable of deterring and defeating a wide range of threats to critical infrastructure, force projection capability, and our citizens.

As competitor ambitions and capabilities grow, USNORTHCOM and NORAD remain committed to improving all-domain awareness, reinforcing our vital network of allies and partners, and fostering a workforce of skilled and dedicated civilian and military professionals. Each of these focus areas are critical to ensuring the homeland defense enterprise remains ready to deter and defeat any threat to our nations today and well into the future, and both commands have made significant strides

in building the capabilities, networks, and people needed to execute their vital missions.

THREATS TO NORTH AMERICA

The global security environment is growing increasingly volatile, characterized by intensifying competition among major powers and mounting threats to the rules-based international order. Among the myriad developments that are reshaping the strategic environment, three trends are of particular concern to NORAD and USNORTHCOM due to their immediate implications for our Homeland Defense mission.

First, the likelihood of a direct conflict between the United States and one of its four principal adversaries is increasing. While the PRC, Russia, North Korea, and Iran each seek to avoid armed conflict with the United States, their perception of Western decline fosters a growing willingness to challenge the United States on the global stage and increases the risk of miscalculation in a crisis. As Russia's brutal and misguided invasion of Ukraine enters its fourth year, there remain several plausible pathways by which the war could escalate into a direct military conflict with the United States. Similarly, the conflict ignited by Hamas' October 2023 attack on Israel has expanded to encompass much of the Middle East and threatens to embroil the United States in a direct military conflict with Iran and its proxies.

Meanwhile, simmering tensions in the Taiwan Strait and South China Sea carry a persistent risk of escalation into armed conflict between China and the United States, with consequences that could span a generation. Finally, Kim Jong Un's public abandonment of peaceful reunification as a national goal and growing assertiveness on the global stage risks sparking renewed conflict on the Korean Peninsula after more than seven decades of uneasy Armistice.

Second, strategic cooperation between and among our four principal adversaries has grown substantially since the beginning of the Ukraine War, increasing the risk that war with one adversary could quickly expand into war with an enemy coalition. To date, each of these relationships has remained mostly transactional, and none has advanced to the level of a formal military alliance. Nonetheless, these countries' shared perceptions of the West as a global destabilizing force could form the foundation of a wartime partnership. At the center of this concerning dynamic is a rapidly evolving relationship between the United States' two most capable adversaries.

Despite decades of mutual mistrust, Beijing and Moscow seem determined to advance their strategic partnership and military cooperation to counter what they perceive as a persistent United States threat to their core security interests. Catalyzed by the onset of a major war, this nascent military cooperation could quickly expand into coordinated military operations that complicate U.S. and allied planning and advance each adversary's ability to threaten North America. We saw glimpses of this enhanced military cooperation last summer when Chinese bomber aircraft deployed to a Russian Arctic airbase and flew a combined patrol with Russian heavy bombers over the Bering Sea.

Such "access transfer" accelerates and extends China's ability to threaten North America in the air domain and raises the specter of coordinated military operations in the event of a strategic conflict. Separately, North Korea's willingness to risk its own troops in support of Russia's war in Ukraine demonstrates the lengths to which these partners are willing to go to advance their strategic positions and defy the Western-led international order. It also raises concerning questions about the quid pro quo that Moscow may offer in return, potentially including expertise that could accelerate Pyongyang's development of advanced strategic weapons.

Third, each of our adversaries is advancing its ability—and, in some cases, rehearsing its plans—to threaten North America in multiple domains and from multiple vectors, increasing the likelihood that an armed conflict would include direct strikes on the Homeland. The PRC is expanding its ability to hold portions of North America at risk with conventionally armed weapons, providing Beijing a strike option against our Homeland that is above its demonstrated robust cyberattack capabilities but below its threshold for nuclear use. Last July, Chinese surface combatants deployed to the Bering Sea for the fourth straight year and operated within cruise missile range of critical infrastructure throughout Alaska. Since 2023, China has launched two hulls of its new Shang III class of nuclear-powered guided-missile submarines (SSGN), which in the coming years could provide Beijing a clandestine land-attack option against critical infrastructure in Alaska and the U.S. West Coast. In November, China incorporated air-refuellable H–6N medium bombers into a Sino-Russian combined bomber patrol, marking the first long-range use of a platform that will extend the PLA Air Force's strike range to include portions of Alaska even without basing or overflight permissions from the Russians. Finally, China

may be exploring the development of conventionally armed ICBMs that could allow Beijing to strike targets in Alaska and the continental United States without crossing the nuclear threshold.

Meanwhile, China is advancing the quantity and sophistication of its North America-threatening nuclear deliver platforms. Chinese missile developers are probably developing nuclear-armed ICBMs equipped with hypersonic glide vehicles (HGVs) or the ability to fly a fractional orbital bombardment system (FOBS) trajectory that approaches North America from the south rather than the traditional northerly vector for which our legacy early warning radars were designed. Such systems, if fielded, would erode strategic stability by degrading our ability to provide granular and actionable warning of an inbound attack.

Despite the degradation of its warfighting capabilities in Ukraine, Russia has enhanced its already formidable capability to threaten North America with conventionally armed air-and sea-based cruise missiles. Three years of strike operations into Ukraine have provided valuable operational experience to Russian aircrews and naval forces. In the last year, Russia's heavy bomber fleet has resumed its pre-war pace of strategic deterrence patrols—including multiple flights along the North American coastline—while simultaneously intensifying its strike operations into Ukraine. In the maritime domain, the Russian submarine force conducted its first port call in Cuba since the cold war and further integrated advanced Severodvinsk-class SSGNs into the Russian Pacific Fleet, portending regular—and potentially concurrent—patrols by cruise missile-capable submarines off North America's Atlantic and Pacific coasts.

In the nuclear domain, Russia fielded the world's first HGV-equipped ICBM over 5 years ago and continues to develop and test other novel nuclear delivery systems, like the FOBS-capable Sarmat heavy ICBM, the Poseidon transoceanic torpedo, and the Burevestnik nuclear-propelled cruise missile. If fielded, these advanced weapons will severely challenge our ability to detect and characterize an inbound attack and determine an appropriate response during a conflict.

North Korea continues to defy the international nonproliferation regime and advance its strategic weapons program. Kim Jong Un's newest ICBM—the Hwasong–19 he first tested last October—probably can deliver a nuclear payload to targets throughout North America while minimizing our ability to provide pre-launch warning due to the shortened launch preparation timelines afforded by its solid-propellant design. Regime rhetoric surrounding the new ICBM suggests Kim is eager to transition his strategic weapons program from research and development to serial production and fielding, a process that could rapidly expand North Korea's inventory and narrow my confidence in USNORTHCOM's ballistic missile defense capacity in the coming years.

Finally, Iran retains the capability to strike the United States in the cyber domain and through its asymmetric and proxy operations. Meanwhile, Iran's burgeoning nuclear energy and space launch programs provide a viable pathway for developing a North America-threatening ICBM should its leaders determine that they need a more forceful means of challenging the United States.

Separately, we face a variety of non-traditional threats that could disrupt critical services in the Homeland and degrade NORAD and USNORTHCOM's ability to carry out our no-fail missions. Key among these is a spate of activity over the past year involving small uncrewed aircraft systems (sUAS) operating over sensitive DOD installations and other Defense Critical Infrastructure. While much of this activity may be attributable to hobbyists, peer adversaries clearly have incentive to collect intelligence on these installations, and our law enforcement partners have uncovered evidence of a foreign intelligence nexus in some of these incidents.

Meanwhile, our principal adversaries are concentrating their increasingly sophisticated offensive cyberoperations on U.S. defense and civilian infrastructure. Over the last year, Russian-affiliated cyber actors have conducted attacks on water supply, wastewater, hydroelectric, and energy facilities in the United States, while PRC-sponsored cyber actors have positioned themselves on IT networks in multiple United States sectors, potentially enabling them to rapidly transition to disruptive attacks in the event of a crisis or conflict.

Finally, I remain highly concerned by threats presented by non-State actors. USNORTHCOM assesses the threat of a foreign terrorist attack in North America is at the highest level in at least 5 years, as the Israel-Hamas conflict has motivated foreign terrorist organizations to rejuvenate their attack planning against the United States. These groups have also redoubled their propaganda efforts in the last 18 months to inspire lone-wolf terrorists to pursue attacks within the Homeland, as seen with the deadly January 1st 2025 attack in New Orleans.

Separately, transnational criminal organizations based in Mexico continue to threaten United States sovereignty and territorial integrity through the production

and trafficking of fentanyl and other dangerous drugs and the facilitation of unlawful mass migration toward the U.S. southern border. Drug-related violence has escalated in recent years as rival cartels fight for control of lucrative drug and human trafficking routes and demonstrate a growing willingness to directly engage Mexican security forces, increasing the risk of spillover violence into the United States.

DEFENDING THE HOMELAND

Homeland defense remains USNORTHCOM and NORAD's top priority and essential task. Strategic competitors continue their rapid testing and fielding of precision weapons systems capable of striking targets well into the U.S and Canadian interior. As those threats increase, USNORTHCOM and NORAD are tasked with defending critical defense infrastructure in the Homeland from attack in order to preserve U.S. Force projection capability and mitigating risks to vital transportation, energy, and manufacturing hubs. Addressing threats from long-range missiles, cyberattacks, and unmanned aerial systems requires close coordination and collaboration with a host of interagency, international, and DOD partners, and USNORTHCOM and NORAD are ideally situated to serve as the synchronizer and integrator for that crucial whole-of-government enterprise.

Over the course of the last year, USNORTHCOM and NORAD have expanded on already robust efforts to improve the capability of the Joint Force and the interagency community to defend key sites—from military installations to civilian transportation and energy nodes—from attack. That effort is making significant progress thanks in large part to the expertise, cooperation, and commitment of our DOD and interagency partners. As this critical effort moves forward, success will depend on collaboration across the interagency community, as well as on developing the forward-looking capabilities and policies necessary to ensure a seamless and well-coordinated defensive enterprise that accounts for the unique requirements of conducting defensive operations inside the United States and Canada.

In the event of combat operations or attacks against the United States, USNORTHCOM will have a role in protecting DOD installations—along with airports, seaports, rail networks, and highway infrastructure necessary to project forces into overseas geographic combatant commands—from both kinetic and cyber threats. USNORTHCOM is actively engaged with the whole-of-government enterprise involved in this nationwide effort to refine the plans and deployable, low-collateral capabilities required to mitigate the wide range of threats to these key sites inside the United States.

Protecting Territorial Integrity

Following the January 20, 2025 Presidential declaration of a national emergency on the U.S. southern border, USNORTHCOM was assigned amplified responsibilities for maintaining the territorial integrity and sovereignty of the United States. In accordance with Presidential Executive Orders and Department directives, USNORTHCOM immediately deployed 1,800 military personnel, aircraft, and equipment to the southern border to reinforce existing Federal military personnel, aircraft, and equipment to the southern border to reinforce existing Federal military personnel, aircraft, and equipment to the southern border to reinforce existing Federal military personnel, aircraft, and equipment to the southern border to reinforce existing Federal border security operations in support of U.S. Customs and Border Protection (USCBP). Meanwhile, the command is preparing a Commander's estimate and a detailed contingency plan (CONPLAN), in accordance with Presidential Executive Orders and Department directives, toprovide steady-state border security in accordance with the pending update to the Unified Campaign Plan (UCP) directed by the President. USNORTHCOM's priority is to meet the requirement and intent of these directives, and the command's actions and plans reflect the urgency associated with the President's emergency declaration.

Defending Against Air and Missile Threats

The DPRK continues to test increasingly capable ICBMs, while Russia and the PRC have steadily expanded their stockpiles of highly capable long-range land-attack cruise missiles and the fleets of the delivery platforms that launch them. The risks to the homeland posed by nuclear-armed ICBMs are clear, while advanced PRC and Russian cruise missiles are difficult to detect and can carry both nuclear and conventional payloads. All of these weapons can be launched against the United States and Canada in an effort to degrade the infrastructure enabling United States military force projection, inflict economic harm, and weaken public support for U.S. intervention in overseas conflicts.

As air and missile threats to the homeland will continue to mount, USNORTHCOM and NORAD are taking immediate actions to implement the Janu-

ary 27, 2025 Executive Order directing the building of a Missile Defense Shield for North America. USNORTHCOM and NORAD envision this defensive system of systems as three overlapping defensive domes that will provide a continental all-domain awareness network directly linked to tailored defensive systems capable of defeating threats ranging from high-altitude ballistic missiles to lower-flying air-breathing threats, including cruise missiles and unmanned aerial systems. These systems threaten all of North America, and the commands are working closely with Canadian allies to ensure a fully integrated approach to continental defense.

As the foundational dome, improved domain awareness from the seafloor to space remains the most critical priority for deterring and defeating missile threats to the Homeland. USNORTHCOM and NORAD are working closely with the U.S. Air Force, which has been tasked as the executive agent for air-and cruise-missile defense of the homeland to identify potential solutions to domain awareness challenges. It is vital that the domain awareness network provide the ability to detect, discriminate, and deliver crucial real-time information and a single common operational picture to leaders at all appropriate levels. Command modernization initiatives, including the establishment of a layered system of sensors such as space-based Airborne Moving Target Indicator (AMTI), Over-the-Horizon Radar (OTHR), the E–7 Wedgetail, and Integrated Undersea Surveillance System (IUSS), remain critical to continental defense in order to detect, track, and prosecute adversary submarines, aircraft and surface vessels, as well as inbound missiles.

In the next tier, USNORTHCOM will continue to defend the United States—to include Alaska and Hawaii—attacks from ballistic missiles as well as emerging threat systems. In the near-term, the current United States ground-based midcourse defense system has a long record of success and remains fully capable of defending against a potential DPRK missile attack. However the DPRK's demonstration of larger and more capable ICBM technology will require a corresponding increase in United States BMD capability beyond planned inventories. The on-time fielding of the Next-Generation Interceptor (NGI) remains a major USNORTHCOM priority, and I am working closely with the Missile Defense Agency and the Department to ensure that program remains on track. Looking forward, the United States and Canada must develop the capability to detect, track, and defeat emerging adversary systems, to include ICBMs armed with multiple independently targetable reentry vehicles (MIRVs), hypersonic glide vehicles (HGVs), and fractional orbital bombardment systems (FOBS).

The final tier will defend against air-breathing threats, to include unmanned aerial systems, threat aircraft, advanced land-attack cruise missiles, and hypersonic cruise missiles designed to challenge U.S. Homeland defense systems from lower altitudes. To ensure effectiveness, the three nodes must be resilient, interconnected, and tailored to defeat specific threats, and developing these defenses and associated policy guidance that reflect the complex strategic environment and the reality of a homeland at risk will be critical in the coming years. I have every confidence in our collective ability to overcome these challenges and remain fully committed to collaboration with the Department, international allies, industry partners, and this Committee in pursuit of that critical goal.

OPERATION NOBLE EAGLE (ONE)

While some of the capabilities required for comprehensive air and missile defense of the homeland remain in development, Operation NOBLE EAGLE (ONE) and NORAD's aerospace control mission have secured North American airspace for decades, adapting constantly to ever-evolving threats including Russian—and now PRC—bombers, violent extremist threats to civilian aviation, and advanced cruise missiles launched from the air and sea. NORAD's ability to adapt to and outpace emerging challenges is a cornerstone of the command's longstanding reputation as a pillar of continental defense.

The threats to North American airspace have steadily grown more complex, and now include a spectrum of competitor capabilities that range from modernized long-range bombers and hypersonic cruise missiles down to small unmanned systems that can fit into a backpack. While two decades of whole-of-government response have reduced the threat of terrorist threats to civil aircraft, NORAD maintains the ability to deter and defeat nation-State threats from every avenue of approach to North America while safeguarding national leaders from aerial threats, both in the National Capital Region and around the country.

Given the evolving security environment and robust mitigation efforts carried out by interagency partners, NORAD, in cooperation with the Department and the National Guard Bureau, will make specific changes to "just in case" aerospace control alert forces (ACA–1) this year and is conducting ongoing analysis of "just in time"

flexible response capabilities (ACA–2). Such adjustments will allow NORAD to optimize protection of prioritized Defense Critical Infrastructure while maintaining adequate national response capability in support of civilian air traffic. In turn, the Air Force and the Air National Guard will be able to generate greater readiness against high-end threats though enhanced campaigning and training while remaining available to NORAD when indications and warning triggers are met.

I am grateful to the Committee for your support for these key USNORTHCOM and NORAD priorities, as we work to identify effective and affordable capabilities that will meet this important challenge now and well into the future. The same can be said of our Canadian partners, as the Government of Canada has committed to fielding long-range sensors and weapons system to deter and defeat potential air, sea, and missile threats in the approaches to North America. Integration and collaboration with Canada—through NORAD and in broader continental defense initiatives—will grow even more necessary as our competitor field greater numbers of increasingly advanced long-range cruise missiles.

Countering Unmanned Aerial Systems

There is perhaps no better example of the rapidly evolving strategic environment than the emergence of small unmanned aerial systems (sUAS) as a threat to infrastructure and personnel in the homeland. The availability and utility of small drones has grown exponentially over the last decade, and some have repeatedly employed these systems for illicit purposes. While U.S. and coalition forces overseas have faced the threat of weaponized unmanned systems for years, small drones have emerged as a significant risk to infrastructure and safety in the United States in a relatively short period of time. The widespread availability of small drones, coupled with a complicated regulatory structure and limitations on UAS countermeasures based on concerns for flight safety and privacy, has created significant vulnerabilities that have been exploited by known and unknown actors.

There have been multiple incursions by UAS over military installations in the United States over the past year. To mitigate the potential threats to safety and security presented by UAS overflight of DOD facilities, USNORTHCOM and NORAD, in close coordination with the military Services and DOD, resourced equipment and analytic tools to installation commanders to assist with detection, tracking, and mitigation of potential UAS threats. In November 2024, then-Secretary of Defense Austin directed USNORTHCOM to serve as the synchronizer, integrator, and/or coordinator of domestic counter-small UAS (C-sUAS) activities within the continental United States and Alaska for DOD and, when requested and approved, for the interagency. USNORTHCOM will play a critical role in an enduring whole-of-government effort to protect people, infrastructure, aircraft, and facilities from malign sUAS incursions. This effort will require investment in robust and evolving mitigation technologies suitable for use in the United States, alignment with interagency and industry partners, and policy and statutory changes that balance safety, privacy, and defensive requirements.

In October 2024, USNORTHCOM and NORAD were proud to host Demonstration FALCON PEAK 25.1, which brought together DOD, interagency, and industry partners seeking to demonstrate counter-sUAS sensors and defeat mechanisms. Thanks to extraordinary support from the U.S. Army's 4th Infantry Division, 10th Special Forces Group (Airborne), the Federal Aviation Administration (FAA), the Colorado National Guard, and many others, demonstration participants tracked and engaged live sUAS targets in complex, realistic scenarios over a number of days and nights within military Special Use Airspace. The demonstration provided important insights that the Commands and our partners will continue to build on, including during FALCON PEAK 25.2, which will include a larger slate of vendors, participants, and systems in August 2025, meeting FY25 National Defense Authorization Act direction.

In recognition of the sUAS threat and the Commands' increased responsibilities, USNORTHCOM and NORAD have shifted resources and personnel to establish a C-UAS operations branch within our headquarters. This Committee has long been aware of the potential threat presented by sUAS, and I would like to extend my appreciation for your ongoing support for C-UAS research and acquisitions. That support will remain critical as success in the homeland C-sUAS mission will depend on improved C-UAS technology, interagency collaboration, and corresponding authorities and resourcing for the mission to defend against this significant risk to safety and security.

Cyber Domain Roles and Responses

Threats to civil and military infrastructure are a direct and constant concern for USNORTHCOM and NORAD. While not directly responsible for the defense of non-

USNORTHCOM networks, cyberattacks against United States and Canadian infrastructure carry the potential to negatively impact DOD force projection and could require significant defense support to civil authorities to mitigate the consequences of a damaging cyberattack against transportation, energy, or economic networks.

Any direct action against the United States by a major competitor would almost certainly involve cyberattacks against strategic North American infrastructure, and USNORTHCOM collaborates daily with U.S. Cyber Command (USCYBERCOM), the Cybersecurity and Infrastructure Security Agency (CISA), the Federal Bureau of Investigation (FBI), and any number of other intergovernmental partners to deter, defend, and—if necessary—respond to cyberattacks.

Defense Operations in the Arctic

Defending North America is inherently linked to the ability of the Joint Force to operate effectively across the entire USNORTHCOM area of responsibility—to include the Arctic. Russia is expanding its capability and capacity to conduct military operations in the Arctic, seeking to control access to northern sea lanes and threaten North America from the northern approaches. In 2024, Russian and PRC aircraft and surface vessels conducted joint patrols in the Bering Sea, while the PRC repeatedly deployed dual-purpose vessels into the Arctic as part of a longstanding effort to expand the ability of the People's Liberation Army Navy (PLAN) to conduct multi-domain operations in the high north.

Arctic responsibilities are shared across multiple geographic and functional combatant commands, and as competition in the region increases, safeguarding Arctic access and freedom of maneuver will depend on Joint Force Arctic operational capabilities and build on the already strong ties between Arctic partners. USNORTHCOM places enormous value on the ability to conduct operations and exercises in the high north and to execute assigned missions in coordination with fellow combatant commands.

The annual ARCTIC EDGE exercise is a key example of a USNORTHCOM event that evaluates combatant command planning, communications, and operational oversight while simultaneously providing warfighters and enablers with valuable operational experience as they test the people, equipment, and logistics trains needed to execute their missions in remote and austere locations. Regular exercises and real-world operations in the Arctic remain critically important and generate valuable lessons learned for participants from the combatant command and components headquarters down to the operational and tactical levels. Effective operations in the Arctic require specialized training and equipment under the best of conditions, and there is no substitute for real-world experience in the region. USNORTHCOM and NORAD will continue to advocate for designated Arctic units that are specifically trained and equipped to execute their assigned missions in all conditions.

As inter-reliance between allies and partners grows increasingly vital to ensuring a secure and open Arctic, USNORTHCOM and NORAD gain strength and capability from our military partnerships. In particular, the Canadian Armed Forces' expertise in Arctic operations and the Government of Canada's longstanding commitment to Arctic security are of enormous value to continental defense. Canada's Arctic Foreign Policy (CAFP), announced in December 2024, clearly recognizes the significance of Russia-PRC collaboration in the Arctic as well as the vast importance of the North American Arctic to both the United States and Canada.

This policy will directly support NORAD through international diplomatic engagement and a series of important Canadian defense investments that will strengthen shared continental defense capabilities. The extraordinary value of the United States-Canadian defense relationship has proven itself time and again over the course of six decades, and I have every confidence that the the strategic vision and commitment to North American defense articulated in the CAFP, when resourced, will pay dividends for the defense of North America for many years to come.

SECURITY COOPERATION WITH REGIONAL PARTNERS

USNORTHCOM's regional security cooperation relationships remain a critical element of the command's missions. USNORTHCOM's military partnerships with Canada, Mexico, and The Bahamas enhance our own homeland defense while building the capacity of those partners to operate and communicate with United States Forces. Those relationships are vital to countering competitor influence and presence in the Western Hemisphere while improving intelligence sharing, border security, and domain awareness.

Decades of information sharing, combined exercises, and routine direct engagement between USNORTHCOM senior leaders and our Canadian, Mexican, and Bahamian military counterparts has brought North American defense cooperation to a historic high point. The bilateral and multilateral ties between our militaries will

be of critical importance over the next 18 months as the United States, Mexico, and Canada prepare to host the FIFA World Cup in the summer of 2026. USNORTHCOM's capacity to synchronize interagency and international partners will be crucial to ensuring the safety and security of this quadrennial global tournament. That work—which will involve dozens of military, intelligence community, and law-enforcement partners from all three host nations—is already well underway and will grow in scope and scale through the end of the competition.

In the meantime, USNORTHCOM's routine engagements and exercises with our regional partners have produced operational capability with direct benefits for the defense of North America. In 2024, as a Russian Navy surface action group (SAG) transited the Atlantic Ocean, USNORTHCOM, NORAD, the Canadian Armed Forces, United States European Command, and United States Southern Command maintained constant common situational awareness of the SAG's location, while executing seamless operations across multiple international and combatant command boundaries. The execution of this mission was the direct result of the close ties between USNORTHCOM and our international and cross-command partners and demonstrated a degree of commonality and interoperability that our competitors are years from being able to match.

Building our partners' ability to operate with U.S. Forces has led directly to improved regional domain awareness, information sharing, and cooperation against shared security challenges, especially given the efforts of peer competitors to gain influence with the United States' nearest neighbors. USNORTHCOM's dedicated efforts to support our partners' defense requirements over the years have played an important role in maintaining the United States as the clear partner of choice while simultaneously improving our partners' capability and capacity for addressing internal security challenges. USNORTHCOM remains committed to these essential relationships.

DEFENSE SUPPORT OF CIVIL AUTHORITIES (DSCA)

USNORTHCOM's support to civilian Federal agencies in times of need stands as the command's most visible mission to American citizens. Operating in support of a lead Federal agency, USNORTHCOM leverages the command's expertise in planning, synchronization, and operations to prepare for, assess, respond to, and recover from domestic incidents. In 2024, USNORTHCOM provided air assets and ground forces to fight major wildfires in the western United States, to include the recent fires in Los Angeles; delivered relief to Americans in need following major hurricanes and flooding along the Atlantic coast; supported Federal law enforcement in securing National Special Security Events (NSSE); reinforced Federal counter-drug efforts, and augmented USCBP border operations.

USNORTHCOM is proud to support each Federal partner, and delivering relief to American citizens exercises the same planning, operations, and communications mechanisms required to conduct homeland defense operations during periods of crisis and conflict. Drawing on the Command's expertise, specialized capabilities, and robust interagency networks, USNORTHCOM supports the vital missions of U.S. Federal law enforcement partners as they safeguard U.S. borders and citizens by leveraging the command's specialized intelligence collection capabilities abroad.

Those capabilities also allow USNORTHCOM to play an increasing role in illuminating the illicit networks used by criminal cartels to move money, human traffic, and illegal drugs. The narcotics smuggled into the United States by transnational criminal organizations are directly responsible for tens of thousands of deaths each year, and USNORTHCOM welcomes the opportunity to assist partners in reducing the flow of illicit drugs into the United States.

In the aftermath of the catastrophic flooding that struck eastern North Carolina in October 2024, USNORTHCOM supported the Federal Emergency Management Agency (FEMA) with ground forces and aviation assets for search and rescue, delivery of relief supplies, route clearance, and other key missions that directly assisted residents of the affected areas. I want to specifically recognize the extraordinary response of leaders and Soldiers from the U.S. Army's XVIII Airborne Corps, to include units from the 101st Airborne Division and the 82d Airborne Division. Thanks to their readiness, skill, and devotion to their mission, every USNORTHCOM request for forces was executed well ahead of required timelines and enabled an extraordinary response to a historic disaster. While there were certainly lessons learned for an even more effective response in future contingencies, I am extremely proud of the work done by USNORTHCOM, U.S. Army North and the deployed U.S. Army units whose incredible efforts helped so many Americans in need.

A similar level of support from across the Department enabled USNORTHCOM to augment U.S. Secret Service (USSS) protection of the major Presidential and

vice-Presidential candidates during the last several months of the 2024 Presidential campaign. In response to a USSS request for assistance following the attempted assassination of President Trump, USNORTHCOM, in concert with the Joint Staff and the military Services, provided explosive ordinance technicians, military working dog teams, and rotary-wing assets to ensure the safety and security of the candidates at nearly 200 locations. Successfully deploying dozens of highly specialized security teams to hundreds of event sites was a testament to the professional planners and operators involved with the mission, and I am proud of USNORTHCOM's support for this critical effort.

CONCLUSION

I am honored and privileged to lead the men and women of USNORTHCOM and NORAD. I thank our service members and civilian employees for their efforts while executing our noble mission of defending the United States and Canada as both commands continue to expand our bi-national, whole-of-government, continental approach to homeland defense. I appreciate the critical role Congress plays in ensuring our service members remain ready to defend our homeland now and in the future, and I look forward to continued collaboration with all of our critical partners in defending our great nations.

We Have the Watch

Senator FISCHER. Thank you, General. General Collins, welcome.

STATEMENT OF LIEUTENANT GENERAL HEATH A. COLLINS, USAF, DIRECTOR, MISSILE DEFENSE AGENCY

General COLLINS. Thank you, ma'am. Good afternoon, Chair Fischer, Ranking Member King, distinguished Members of the Subcommittee. Thank you for this opportunity to talk about the Missile Defense Agency portfolio.

MDA is moving quickly to provide effective defenses against a dangerous missile threat to defend the U.S. Homeland, our deployed forces, and our allies and friends. The agency is transforming itself, its enterprise, and its industry base in order to develop and deliver capabilities to the warfighter, at scale and speed.

As we move with urgency to deliver the next-generation missile defense system, we intend to leverage the performance efficiencies found at integrated layered defenses. We also will continue to integrate and improve the space domain to support a missile defense posture that is more effective, resilient, and adaptable, to known and unanticipated threats.

MDA's focus is on the improvement and sustainment of U.S. Homeland and regional defenses. We are enhancing the performance and capability of the fielded, Ground-based Midcourse Defense system along with development and testing of the Next-Generation Interceptor. We are working with the Navy to improve the Aegis Ballistic Missile Defense (BMD) capability and enhance hypersonic defenses, and with the Army to make investments in the future development of the Terminal High Altitude Area Defense system, THAAD.

Together in support of the Nation's missile defense enterprise and Golden Dome for America, MDA remains focused on delivering advanced, reliable, and resilient capabilities on accelerated timelines to meet the warfighter's needs.

I greatly appreciate your continued support for MDA and for the missile defense mission, and I look forward to answering your questions. Thank you.

[The prepared statement of General Collins follows:]

PREPARED STATEMENT BY LIEUTENANT GENERAL HEATH A. COLLINS

Chairwoman Fischer, Ranking Member King, and distinguished Members of the Subcommittee, it is an honor to appear before you today to discuss the Missile Defense Agency (MDA) portfolio.

MDA is moving fast to provide effective defenses for the protection of the U.S. Homeland, deployed forces, and our allies and friends. We are focused on delivering advanced, reliable, resilient capabilities on accelerated timelines to meet Warfighter needs. Today, MDA is transforming itself, its enterprise, and its industry base to employ modern digital frameworks, models, and tools that improve decision advantage in order to field capabilities to the Warfighter at speed and scale. MDA is also engaging non-traditional companies with their innovative tools and approaches to tackle complex design and integration challenges. These efforts will reduce lead times and increasing transparency, agility, and efficiency to enable the MDA workforce to focus on delivering next generation missile defense capabilities.

Over the past decade, adversaries have significantly advanced their ability to strike the homeland and field more sophisticated long-range weapons, including new ballistic, cruise, and hypersonic missiles. China is at varying stages of developing nuclear-armed Intercontinental Ballistic Missile (ICBM)-class hypersonic glide vehicles (HGV), orbital weapons, and even conventionally armed long-range missiles designed to strike the Continental United States (CONUS) without crossing the nuclear threshold. Russia has improved its already formidable capability to threaten CONUS and recently fielded the world's first HGV-equipped ICBM. Moscow continues to develop and test other novel nuclear delivery platforms like the Sarmat heavy ICBM and the Burevestnik nuclear-powered cruise missile. Russian bombers and naval combatants have resumed deterrence patrols that place their cruise missiles in range of the homeland. North Korea is advancing its strategic weapons program. In October 2024, Pyongyang tested the new Hwasong–19 ICBM that can probably deliver a nuclear payload to points across North America. Iran is growing its nuclear and space launch programs to provide a viable pathway for developing a nuclear-armed ICBM, should Tehran decide to do so.

LAYERING AND INTEGRATION CRITICAL TO SYSTEM PERFORMANCE

Layering defenses is critical to improving the performance of any missile defense system. A network of geographically dispersed sensors and diverse weapon systems allows the system to engage inbound threats at varying times in the missile's flight to improve overall defense effectiveness. There are system performance benefits to having engagement capabilities in different geographic domains and the ability to layer engagements, to include increasing the probability of a successful intercept.

An examination of the defense of Israel from real world missile attacks over the past 17 months provides a look at the performance efficiencies integrated layered defenses make possible. In 2024, Iran conducted two large-scale aerial and missile attacks on Israel. Israeli missile defenses and the United States Missile Defense System demonstrated combat-proven interoperability by detecting, tracking, and engaging the most complex, dense, and stressing ballistic missile attacks in history, saving countless Israeli and American lives. These same United States and Israeli assets have successfully defended Israel against dozens of missiles launched from Yemen by the Houthis.

Working together with Israeli missile defense systems, Aegis BMD and Terminal High Altitude Area Defense (THAAD) have performed exceptionally well, contributing to the highly successful protection of Israel as well as United States and international military forces and the civilian population. Aegis BMD demonstrated operational capability outside its design requirements. Standard Missile (SM)–3 Block IA and Block IB missiles demonstrated high reliability and excess capabilities in these operations. SM–6 missiles fired in Sea-Based Terminal mode demonstrated high reliability and effectiveness. We have been working closely during this period with the Navy to deliver missile software upgrades and Aegis weapon system upgrades to improve defenses. Additionally, the U.S. Army deployed THAAD to Israel in October 2024 and has since conducted the first U.S. engagement with the weapon system. The system has performed very well with regional partners in defensive operations demonstrating the maturity, reliability, and effectiveness of the THAAD system, fully integrated and layered with the Israeli missile defense systems. During these operations, we learned much about the effectiveness of our sensors, weapons, command and control systems and the tactics, techniques and procedures to employ them effectively, validating the need for layered missile defenses. The exo- and endo-atmospheric layers across multiple systems proved vital in reducing the engagement burden on lower tier systems, prevented damage to critical defended assets, and ultimately saved lives.

A missile defense system is only as effective as its ability to command and control all integrated elements. The Command and Control, Battle Management and Communications (C2BMC) system proved its value in integrating real-world combat operations. C2BMC provides global communications, command and control and is a force multiplier that brings different sensors and shooters together so that systems not designed to work together can share data and engage threats they otherwise would not have been able to see. In the Middle East, C2BMC enabled remote engagements by both Aegis and Israeli systems, correlated and combined overhead and terrestrial sensor data, extended engagement ranges far beyond internal weapon system radars resulting in improved system level performance.

As part of a future layered defense construct within the Missile Defense System, we will buildupon C2BMC to deploy a more scalable, operational open architecture to increase data processing capabilities, improve missile defense system performance, and enable situational awareness for senior commanders and battle management and command and control for operational warfighters throughout a mass raid situation. C2BMC will also expand the existing, globally deployed network to integrate more sensors and shooters and provide secure, physical communication data links for all new sites.

There is a growing Warfighter demand for enhanced joint force capabilities to combat threats across the continuum of air, cruise, ballistic and hypersonic missiles. MDA, as the Integrated Air and Missile Defense (IAMD) Technical Authority, is engineering and prototyping the Joint Tactical Integrated Fire Control (JTIFC) architecture focusing on multi-domain, cross-Service kill chains, enabling true "right sensor, right shooter" capability to counter emerging threats. JTIFC enhances integrated fire control capabilities across the Services and agencies by essentially "connecting" existing sensors, command and control systems, and weapons at the tactical level.

JTIFC efforts include MDA's Joint Track Management Capability (JTMC) Bridge, which is designed to connect Army, Navy, Marine Corps, and Air Force weapons, sensors, and fire control networks into a Joint Integrated Fire Control Network. The JTMC Bridge is on a path to field with the Army Integrated Battle Command System (IBCS), Navy Cooperative Engagement Capability (CEC), and Air Force Tactical Operations Center—Light (TOC-L) Programs of Record in 2027 to 2028.

This JTIFC architecture has been demonstrated at multiple Combatant Command and Service exercises, to include the successful intercept of a cruise missile during Army Flight Test 6 in 2021. Recurring Service exercises include the Army's annual Project Convergence (Capstone 5 upcoming), U.S. Indo-Pacific Command's biennial Valiant Shield and Operation Sling Stone, and U.S. Northern Command's Northern Edge. Future JTIFC capabilities to be engineered and planned for delivery to the Services' programs include the fusion of combat identification features from all sensors, force level engagement coordination, and distributed electronic protection capabilities. The Guam Defense System builds on the JTIFC core architecture and future capabilities, ensuring joint weapons and sensors are integrated for layered area defense. Recognizing that a more effective force is integrated and interoperable with allies and partners, JTIFC can enable cross-Nation kill chains in support of evolving warfighting concepts and security partnerships.

SPACE IS VITAL TO FUTURE MISSILE DEFENSE

We must continue to integrate and leverage the space domain as we sharpen our focus today to develop and deliver the next generation missile defense system. The exploitation of space supports a missile defense posture that is more effective, resilient, and adaptable to known and unanticipated threats. The proximity, persistence, and precision of space-based missile defense assets offers a truly transformative capability.

To ensure rapid gap coverage, MDA has developed prototypes designed with Warfighter capabilities in mind. The MDA Hypersonic and Ballistic Tracking Space Sensor (HBTSS) program, for example, is helping to close the gap by supporting detection and tracking of hypersonic weapons and providing multi-domain support to the Overhead Persistent Infrared (OPIR) enterprise architecture. HBTSS, which provides fire control quality data to support engagements, is proving to be a critical element of our future hypersonic kill chain. Currently, HBTSS has collected over half a million images, to include data collected from test targets, targets of opportunity, and real-world events. Additionally, the HBTSS program has made remarkable development achievements. It implemented a new enterprise ground system in just 36 months; rapidly designed and built two satellites within 36 months; conducted the first accelerated National Security Space Launch within 12 months in collaboration with the Space Force; and participated in its first test within 119 days

of launch. MDA will continue to grow its collaboration with the Space Force to develop and deliver this vital capability to the future Proliferated Warfighter Space Architecture.

Following an extremely successful HBTSS program, we are pursuing the same approach in developing the Discriminating Space Sensor (DSS) to perform birth-to-death tracking and discrimination of in-flight ballistic missiles and their payload objects. MDA will launch a DSS prototype satellite in 2029, followed by on-orbit test and demonstration of DSS capabilities to inform future space-based architecture and design requirements. The DSS prototype will demonstrate the technology required to track ballistic missiles from space birth to death while discriminating lethal objects from non-lethal objects, with the final operational DSS system design to be decided by the Space Force. MDA will expand the demonstration of critical DSS capabilities to provide the United States an interim capability to defend against ballistic and other advanced missile threats from peer, near-peer, and rogue adversaries.

Finally, President Trump's January 27, 2025 Executive Order highlighted the need to develop cutting-edge, next generation, kinetic and non-kinetic capabilities that will include a focus on the development of space-based interceptors (SBI) capable of boost phase defense. A space engagement layer would complement land-and sea-based defenses. MDA stands ready to work closely with the Space Force and other stakeholders on the development and delivery of the SBI architecture. From a missile defense architect and developer perspective, a space-based missile defense layer would offer numerous benefits, including a persistent on-call global presence, which would reduce the risks associated with hostile missiles launched with little or no notice from different regions around the world.

LEVERAGING ADVANCED TECHNOLOGIES FOR FUTURE CAPABILITIES

MDA is rapidly developing, demonstrating, and transitioning disruptive missile defeat capabilities to deter, degrade, and destroy adversary threats. MDA is using the rapid development of prototypes to develop and demonstrate disruptive, "game-changing" capabilities, with incremental capability off-ramps to the Warfighter. We recently unveiled a new framework to streamline the acquisition of missile defense technologies. One significant part of this framework is the use of a Multiple Authority Announcement (MAA), which consolidates a broad range of procurement authorities and methods, such as Other Transactions, Commercial Solution Openings, Procurement for Experimental Purposes, Cooperative Research and Development Agreements, grants, and research and development agreements. The MAA, which was released last month, is an acquisition approach gear toward reaching non-traditional defense contractors. However, it does not prevent traditional defense contractors from participating when they have solutions that could potentially meet the Government's needs. The MAA seeks responses from a broad set of innovative technology companies to develop capabilities that allow MDA to better manage complex design and integration challenges and accelerate critical decisionmaking. The combination of a competitive environment with simplified procurement processes and continued leverage of MDA's unique acquisition authorities will strengthen our ability to accelerate overall timelines and deliver operational capability to the Warfighter.

The Agency is developing a multi-layered defensive architecture to counter hypersonic threats in defense of the homeland. This architecture leverages advanced sensors for early warning, identification, and persistent tracking of hypersonic threats. MDA is analyzing several initiatives to address these threats, including: enhancing persistent tracking of unpredictable targets, improving communication systems, adapting fire control strategies, and developing new kinetic interceptors with exceptional agility in extreme aerothermal environments. Additionally, MDA is exploring non-kinetic solutions and payloads to effectively neutralize hypersonic threats.

MDA is collaborating across the DOD Special Projects enterprise to synergize resources and leverage residual missile defense capabilities. Our advanced Modeling, Simulation, and Analysis laboratory provides element-and component-level performance assessment up to mission-level analysis at all levels of classification. The lab is on a growth path to federate the models across the DOD, providing an integrated approach to missile defeat.

MDA is prioritizing the integration of Directed Energy (DE) systems into the Missile Defense System, which would reduce the burden on kinetic interceptors and augment existing capabilities. In 2024, the Directed Energy Independent Assessment Team recommended MDA reestablish efforts to develop and deploy DE systems. MDA also initiated work on a phased, long-range detect and track rapid prototype, coupled with a kill laser. Conceptually, a High Energy Laser can thin out the

number of objects in an attack, lower the cost per kill, and provide a nearly unlimited magazine. MDA is on a path to demonstrate progressively higher High Energy Laser power levels, with incremental capability off-ramps to Service partners on the path to an objective capability. MDA also supports a joint DOD effort to determine the effectiveness of High Energy Laser weapon systems against a series of dynamic targets. In 2024–2025, the Probability of Weapons Effectiveness Experiment successfully engaged and negated a series of dynamic targets in crossing and head-on profiles. Finally, High Energy Laser for Regional Airborne Defense (HELRAD) explores the application space for state-of-the-art directed energy systems as they apply to future MDA architectures, identifying opportunities for MDA's future DE programs. MDA will continue to partner across the DOD and Intelligence Community to ensure a seamless left-through-right-of-launch integration effort in defeating missile threats.

HOMELAND DEFENSE

For homeland defense, MDA continues to improve performance of the fielded Ground-based Midcourse Defense (GMD) system, which recently celebrated its 20 year anniversary of 24/7 defense of the homeland. In 2025, we will deploy capability to increase battle-space via a change to the Ground Based Interceptor (GBI) that enables firing only two of the three solid rocket motors along with discrimination improvements to improve overall system performance against more complex threats with countermeasures. Additionally, MDA is continuing development and testing of the Next Generation Interceptor (NGI), which is the future replacement for the GBI fleet. The NGI's modular design will facilitate upgrades to address evolving threats and provide a substantial increase in firepower given the multiple kill vehicles on board. Additionally, NGI will provide a reduced cost-per-kill through its increased efficiency, reliability, and availability, providing greater magazine depth.

We received authority to proceed into the Product Development Phase with the NGI program in September 2024 and have enjoyed many successes thus far in this new phase of development. However, there are some challenges we are addressing given the complexity of the NGI weapon system. Beyond the expected design challenges, we have experienced unanticipated programmatic, technical, and producibility challenges that are driving increases to the estimated development and deployment schedule. The earlier-than-planned down-select in April 2024 had a significant impact on NGI's supply chain. Upon learning of the early down-select, NGI suppliers moved quickly to limit fiscal exposure and, in some instances, stopped development work on critical NGI components while waiting for the final down-select decision. The combination of these supply chain impacts along with post-COVID-induced inflation have adversely impacted the program. In addition, we have experienced significant development and manufacturing challenges with the solid rocket motor cases to be used in qualification testing. Solid rocket motors are on the critical path to executing the first flight test of the NGI. These development and supply chain challenges required us to develop a comprehensive NGI re-plan schedule. The result is key milestones have shifted to the right.

Despite these challenges, the NGI program continues to move forward while still enforcing technical rigor and a "fly before you buy" approach to deliver this critically important capability. The NGI program will execute an All Up Round Critical Design Review in first quarter fiscal year 2027 on the way to completing two rigorous flight tests in fiscal year 2029. This will provide USNORTHCOM with an opportunity to declare an Initial Operational Capability no later than fiscal year 2030. To demonstrate confidence and to reduce program risk, MDA is exploring options for a flight test demonstration in 2028.

Concurrent with NGI development, MDA is upgrading the legacy fielded homeland defense system ground components supporting the GBI fleet to ensure seamless NGI compatibility to address the evolving threat. The ground weapon system monitors the health and status of interceptors, conducts pre-launch activities, performs engagement planning, tasks interceptors at launch, provides in-flight updates to the interceptor, and ensures communication connectivity between all of the launch sites and ground-based sensors. We have synchronized the ground weapon system development schedule with the NGI re-plan schedule. Together, these two programs have an executable path forward to provide USNORTHCOM with improved capability and capacity against the 2030+ advanced peer, near-peer, and rogue nation threats.

From a sensor perspective, MDA added Long Range Discrimination Radar (LRDR) for Space Domain Awareness in December 2024. LRDR is currently preparing for an operational flight test, Flight Test Other (FTX)–26a, in the third quarter of fiscal year 2025. LRDR will use an updated software build to improve discrimination per-

formance against additional threats while adding hypersonic defense tracking capability. MDA is partnering with Space Force, USNORTHCOM, and U.S. Space Command (USSPACECOM) to accelerate fielding these LRDR capability improvements. MDA plans to complete the LRDR transition and transfer process with the Space Force in 2025.

Finally, we will deliver a new C2BMC capability to USNORTHCOM and U.S. Indo-Pacific Command (USINDOPACOM) in summer 2025, including faster user interface responsiveness and improvements allowing USNORTHCOM to receive GMD real-time fire control options, improving USNORTHCOM Commander decision-space timing. In fiscal year 2026, we plan to upgrade space track processing timelines, improving defense against large raids and reporting on hypersonic threats to potential missile defense shooters.

REGIONAL DEFENSE

Globally deployed sea-based and land-based Aegis BMD capabilities are critical to the Nation's defense of our deployed forces, allies, and partners against a wide variety of short-, medium-, and intermediate-range missile threats. MDA continues to design improvements to the Aegis BMD capability, improving Sea Based Terminal (SBT) defense, advancing weapon system and missile reliability, and enhancing Aegis BMD engagement capacity and lethality. We will continue to develop Aegis BMD weapon system software to enhance functionality and leverage more-capable radars and National Technical Means.

Aegis Baseline 9.2.4 (with BMD 5.1.5) is still on track to meet certification in third quarter fiscal year 2025. Once certified, this baseline is expected to deploy to 14 U.S. Navy ships. BMD 5.1.5 adds capability for Sea-Based Terminal Increment 3, increased ballistic and hypersonic threat space, expanded hypersonic tracking and Link 16 reporting, enhanced space domain awareness, and discrimination architecture improvements. MDA is on track to meet our SM–3 Blk IB and IIA deliveries for FY2025, having completed 54 new production deliveries and 35 recertifications across all variants.

MDA has received supplemental funding in both fiscal year 2024 and fiscal year 2025 to procure replacement missiles for those expended in combat operations, as well as an increase in fiscal year 2025 funding to continue production of SM–3 Block IB missiles. MDA is proactively working to minimize and mitigate expected SM–3 Block IB production gaps while the Prime contractor works to complete its proposal in support of a synergy buy. With fiscal year 2024 and fiscal year 2025 funds, MDA is moving forward to award this contract for procurement of SM–3 Block IB missiles by the end of calendar year 2025.

MDA is committed to developing a layered defense against rapidly evolving threats, with a particular focus on countering regional hypersonic missiles. Today, Aegis BMD ships are equipped with SBT capability, which is tested, certified, and deployed, including an initial defensive capability against hypersonic threats. MDA has been working closely with the Navy to develop field and upgrade SBT defenses to counter advanced threats. With the successful Flight Test Aegis Weapon System (FTM)–32 in March 2024 and the FTX–40 successful demonstration this past March, we moved another step closer to making SBT Increment 3 an operational capability, improving our capability against some hypersonic threats.

The Glide Phase Intercept (GPI) development program represents a key element in defeating the rapidly evolving hypersonic threat of the layered defense strategy. GPI will expand the area defensible against these threats and account for expected future developments by our adversaries. Developing and fielding GPI capability is essential to countering not only the hypersonic threats we face today but also those anticipated in 2035 and beyond. MDA's plan for GPI development meets a critical need for the warfighter and can be leveraged to deliver this capability in defense of the homeland and can be accelerated with adequate resources. Additionally, we are seeking a layered approach with other kinetic and non-kinetic effects to accelerate the defeat of the hypersonic threat as part of the MDA Hypersonic Defense Task Force.

In May 2024, MDA and Japan Ministry of Defense (MoD) signed a formal Cooperative Development arrangement to jointly develop and mature the GPI. This strategic collaboration leverages Japan's world-class expertise in key missile components, particularly in advanced propulsion and aerodynamic control technologies. Cooperative development of the GPI will deliver a critical capability to counter threats in the USINDOPACOM region for both Japan and the United States.

As mentioned last year, previous Department priorities and funding decisions drove MDA to move forward with carrying out the prototype project with a single interceptor developer in September 2024, opposed to two, in contrast to our ap-

proved acquisition strategy. As a result, the program schedule moved right to 2035 and the overall programmatic risk is high. MDA is working diligently with our partner, Japan, and our industry partner to shore up the program and look for any opportunities to accelerate and burn down risk as soon as possible. In addition to GPI interceptor development, MDA continues to develop enhancements to the mature and capable Aegis Weapon System. These software-only enhancements will enable seamless integration of the GPI interceptor by leveraging existing Aegis capability to engage and kill threats based on remote sensor data.

The Department is continuing development of a missile defense capability for the defense of Guam against diverse missile threats. In collaboration with the Navy, we are supporting the Army as they execute the USINDOPACOM requirement for a layered missile defense capability on Guam against simultaneous raids of cruise, ballistic, maneuvering, and hypersonic glide threats. MDA successfully conducted a live intercept in December 2024 of a ballistic missile target, marking the first BMD intercept test event executed from Guam. With Flight Test Experiment Aegis Weapon System (FEM)–02, the initial Aegis Guam System integrated with the new AN/TPY–6 radar and Vertical Launching System fired a SM–3 Block IIA, which intercepted an air-launched MRBM target off the coast of Guam. The AN/TPY–6 radar tracked the target shortly after launch to intercept in the first end-to-end tracking use of the radar during a live ballistic missile flight test.

The Terminal High Altitude Area Defense (THAAD) Weapon System has a proven track record of defeating incoming threats and serves as a vital component of our Nation's layered Missile Defense System. The THAAD Weapon System is a globally transportable, ground-based missile defense weapon system that is highly effective against short-, medium-and intermediate-range missile threats inside and outside the atmosphere in the terminal phase of flight. MDA supports and sustains THAAD batteries in CONUS as well as in the USINDOPACOM and U.S. Central Command (USCENTCOM) Areas of Responsibility.

Through the end of second quarter fiscal year 2025, in conjunction with the Army, MDA completed fielding of the global THAAD System Build 4.0 (TH 4.0) to five of seven batteries. The capabilities include enabling remote launch and enhancing integration of Patriot Missile Segment Enhanced (MSE) interceptors within a THAAD battery. These capabilities provide an increase in the defended area and greater engagement opportunities by allowing the Patriot MSE interceptors to leverage the highly effective THAAD AN/TPY–2 radar. Also, with close coordination to better support Commander USCENTCOM, MDA significantly reduced time required to provide warfighters a quick-look analysis following a THAAD Weapon System real-world event.

Starting this quarter, MDA will begin delivering THAAD Battery 8, the first U.S. battery with THAAD Configuration 3.1 hardware and THAAD System Build 5.0 (TH 5.0) software. Configuration 3.1 is the largest hardware upgrade to-date modifying over 190 components to address obsolescence and increase cybersecurity to improve weapon system performance. System-level testing will start at the end of fiscal year 2025. THAAD Battery 8 will execute a series of rigorous test events and demonstrations culminating in Flight Test THAAD Weapon system (FTT)–26 in fiscal year 2027 and supporting the Army's fielding process. MDA plans to begin upgrade on the first of seven U.S. Batteries to Configuration 3.1 in the 2027 timeframe.

MDA will leverage the recently awarded THAAD Evolutionary Development Task Order to continue developing the weapon system and deliver enhanced capabilities to the Warfighter within a more agile and responsive development process. THAAD System Build 6.0 (TH 6.0) and Integrated Battle Command System (IBCS) THAAD Integration (ITI), while experiencing a delayed start due to the incremental continuing resolutions and reduction in the appropriation, will be developed within this agile process. TH 6.0 provides initial capability against non-ballistic threats and increased threat engagement space.

The Army Navy/Transportable Radar Surveillance and Control Model 2 (AN/TPY–2) is a highly transportable multi-functional, high-resolution, phased-array ground-based X-Band sensor that is highly effective at acquiring targets in the boost, mid-course, and terminal phases. AN/TPY–2 can be deployed in forward-based mode (FBM) or terminal mode (TM) configurations for THAAD fire control and engagement operations. FBM radars provide detection close to the threat origin as well as target acquisition and discrimination to the C2BMC interface to support external shooters to include: GBI, Aegis, THAAD, Patriot, and international systems. Currently AN/TPY–2 is deployed in both modes supporting operations in the USINDOPACOM, U.S. European Command, and USCENTCOM areas of responsibility.

ALLIES AND PARTNERS

Close collaboration with our Allies and partners is critical for addressing today's security challenges. MDA actively and closely engages with multiple partners across the globe to build capability and interoperability against shared missile threats.

Asia/Pacific. MDA uses Foreign Military Sales (FMS) to deliver the SM–3 Block IB and Block IIA interceptors to Japan and provide the weapon system components and associated software for two Japanese-built Aegis System Equipped Vessels, which will be fielded with the solid-State SPY–7 radar and an Aegis Weapon System. The first tactical SPY–7 (V)1 radar array has been installed at the Production Test Center in Moorestown, NJ, and has successfully tracked satellites and aircraft. Production of the remaining radar hardware is on track to support full system light-off by the end of fiscal year 2025. MDA is also providing technical assistance to Australia to support its development of a Joint Air Battle Management System that will integrate Australia's air and missile defenses and enable interoperability with United States and other allied IAMD capabilities. MDA conducts cooperative research and development projects and studies with Japan, Republic of Korea, and Australia.

Middle East. MDA continues to foster a strong, long-standing partnership with the Israel Missile Defense Organization. MDA provides $500 million per year for engineering, development, co-production, testing, and fielding of the Arrow Weapon System, the David's Sling Weapon System, and co-production for the Iron Dome Defense System. MDA is also executing fiscal year 2024 $5.2 billion Israel Security Supplemental Funding for additional procurement of Iron Dome Defense System, David's Sling Weapon System, and Iron Beam defense systems to counter short-range rocket threats. Arrow, David's Sling, and Iron Dome proved their immense value in Operation Swords of Iron and allow Israel to maintain their qualitative military edge against their adversaries. As a key participant in the development and negotiation of the supplemental Exchange of Letters, MDA's required U.S. workshare worth $2.750 billion will be brought back to the U.S. industrial base.

In support of our global partners, MDA is currently in production of seven THAAD batteries, including interceptors, for the Kingdom of Saudi Arabia (KSA) FMS case. One battery has been emplaced in Saudi Arabia, and the second is scheduled for shipment later this year. THAAD KSA battery equipment and interceptor production deliveries will continue through fiscal year 2027. MDA also continues to support and provide additional capabilities via FMS to the two THAAD batteries of the United Arab Emirates. UAE was the first nation to employ fielded THAAD batteries during attacks from Iranian proxies. Working multilaterally with the Gulf Cooperation Council, MDA is defining recommendations for an integrated air and missile early warning architecture of sensors and command and control for the Arabian Gulf region.

Europe and North America. MDA has a number of ongoing cooperative research and development projects and studies with the Netherlands, Norway, Denmark, and the United Kingdom. MDA also works closely with NATO by providing subject-matter expertise to the NATO Communication and Information Agency for the continuous testing and interoperability of BMD systems. Last year, MDA and Canada began a study to examine potential architectures to increase missile defense capabilities of North America. This is the first cooperative project between MDA and Canada in 17 years.

LASER FOCUS ON THE WARFIGHTER

None of the Agency's many efforts would be possible without continuous collaboration with the Warfighter. To that end, MDA has intensified strategic engagement with the Combatant Commands, Services, and the Joint Staff. Our Missile Defense Board of Director meetings continue to serve as the premiere senior level forums to coordinate missile defense programs and issues with the Lead Military Departments. MDA goes to great lengths to involve the Warfighter early on during the technology development and product development phases to address requirements. We also support Lead Military Department efforts to plan for Doctrine, Organization, Training, Materiel, Leadership, Personnel, Facilities and Policy factors. Once the capability is fielded, close collaboration with the Services and Combatant Commands is essential to sustain and, as required, enhance that capability throughout its service life. Additionally, we back this up with real-time technical support, as demonstrated during recent real-world operations. Ensuring the Combatant Commanders and Services have what they need to fight and win will always be my top priority.

CONCLUSION

Chairwoman Fischer, Ranking Member King, Members of the Subcommittee, the Missile Defense Agency is committed to attracting and building the strong, skilled workforce we need to develop and deliver this Nation's next generation missile defense system. I would like to recognize and thank the men and women who serve in our Armed Forces at home and abroad and who operate the Missile Defense System with the support of our dedicated civilian and contractor workforce. I greatly appreciate your continued support for MDA and the missile defense mission, and I look forward to answering the committee's questions. Thank you.

Senator FISCHER. Thank you, General. General Rasch, welcome.

STATEMENT OF LIEUTENANT GENERAL ROBERT A. RASCH, USA, EXECUTIVE OFFICER, GUAM DEFENSE SYSTEM JOINT PROGRAM OFFICE

General RASCH. Thank you, Madam Chair. Chairman Fischer, Ranking Member King, and distinguished Members of this Subcommittee, thank you for the opportunity to appear before you today to discuss the criticality of defending the island of Guam. On behalf of the Army Senior Leadership, we thank you for your continued support of our soldiers, sailors, airmen, marines, guardians, civilians, and their families.

Guam is an indispensable part of the Homeland, and its defense is not only essential to the security of the United States but is also a strong deterrence to the ever-evolving complex threats we face. The fiscal year 2023 National Defense Authorization Act required the Secretary of Defense to designate a senior official to oversee the missile defense of Guam. In February 2024, as directed by the Under Secretary of Defense, Acquisition and Sustainment, the Guam Defense System Joint Program Office, JPO, was established at the Army Rapid Capability and Critical Technologies Office. Beyond the Department's investments in Guam's defense, the Under Secretary of the Navy is the appointed lead senior defense official for all other DOD efforts in Guam.

The Joint Program Office is charged with synchronizing the development, testing, fielding, and sustainment of the Guam Defense System components and the integration of the corresponding command and control systems resulting in the development of a Joint Integrated Battle Manager, and this Battle Manager will allow current service and agency-owned components to behave as an integrated and unified system.

The Joint Program Office works closely with the Under Secretary of Defense for Acquisition and Sustainment, the Guam Synchronization Oversight Council, and leadership across the services and the Missile Defense Agency to build and sustain an architecture capable of defending Guam against a multitude of complex air and missile defense threats.

Together, the Department is working diligently and with urgency to secure the initial capability increment in 2027. This will provide capability well beyond the currently employed THAAD battery as part of Task Force Talon. Your continued support ensures that we remain capable of fighting for and from Guam, meeting the challenges of today and tomorrow.

Thank you again for the opportunity to speak with you about this critical mission and the joint commitment to the defense of Guam. Thank you.

[The prepared statement of General Rasch follows:]

PREPARED STATEMENT BY LIEUTENANT GENERAL ROBERT A. RASCH

Chairman Fischer, Ranking Member King, and Members of this Subcommittee, thank you for the opportunity to appear before you today to discuss the criticality of defending the island of Guam. On behalf of the Army Senior Leadership, we thank you for your continued support of our Soldiers, Sailors, Airmen, Marines, Guardians, Civilians, and their Families.

Guam is an indispensable part of the United States, and we are moving with haste to ensure we have the capabilities necessary to defend the island from ever-evolving complex threats. In addition to being part of the homeland, a robust defense of Guam provides a strong deterrence and preserves combat power and Joint Force projection if conflict arises.

Pursuant to the Fiscal Year (FY) 23 National Defense Authorization Act, the Secretary of Defense designated the Under Secretary of Defense for Acquisition and Sustainment (USD(A&S)) as the Senior Defense Official responsible for the missile defense of Guam. In February 2024, as directed by the USD(A&S), the Guam Defense System Joint Program Office (GDS JPO) was established at the Army Rapid Capability and Critical Technologies Office (RCCTO).

GUAM DEFENSE SYSTEM ARCHITECTURE AND BACKGROUND

The JPO is charged with synchronizing the development, testing, fielding and sustainment of the Guam Defense System components and the integration of the corresponding command and control (C2) systems resulting in the development of a Joint Integrated Battle Manager (JIBM). The JIBM will allow current service and agency—owned components to behave as an integrated and unified system. The GDS effort includes the synchronization of over 20 prototype efforts and programs of record across three services and the Missile Defense Agency (MDA). Because of that, the JPO does not control resourcing for Service and Missile Defense Agency (MDA) programs contributing to the GDS architecture. The JPO is the materiel developer for GDS at the systems level and is responsible for providing GDS system-level architectural baselines and Guam-specific technical requirements. The JPO synthesizes the integrated system-level cost, schedule, performance, and risk posture of the GDS, providing senior Department of Defense (DOD) and congressional stakeholders with the necessary information to make informed investment and priority decisions to ensure success.

The DOD's investments in Guam extend beyond the GDS. In January 2024, the Deputy Secretary of Defense appointed the Under Secretary of the Navy as the Lead Senior Defense Official for the DOD's efforts in Guam. Through the Guam Synchronization Oversight Council, a forum that includes senior leaders from across the Office of the Secretary of Defense and the services, the Under Secretary of the Navy ensures visibility on key issues, synchronizes military construction efforts, and serves as the Department's primary liaison to the government of Guam.

The JPO works closely with the USD(A&S), the Guam Synchronization Oversight Council, and leadership across the services and the MDA to build and sustain an architecture capable of defending Guam against a multitude of complex air and missile defense threats. Together, the Department is working diligently and with urgency to secure the initial capability increment in 2027–2028, beyond the currently employed the Terminal High Altitude Area Defense (THAAD) Battery in Task Force Talon. To this end, the JPO is leading the Department's efforts to synchronize and integrate GDS capabilities across several capability domains (doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy) with a specific focus on creating doctrine to fight as an integrated, digitized Joint Force for the Integrated Air and Missile Defense fight. We are working across the enterprise to finalize the organizational structure and path to certify the Guam Command Center, and have also been tasked to create a common understanding across the DOD on the status of GDS and identify risks/gaps to provide mitigation recommendations to the Commander, U.S. Indo-Pacific Command (USINDOPACOM) through a routine series of updates.

The JPO was approved by the USD(A&S) to pursue a hybrid acquisition strategy in which the synchronization of integrated air and missile defense components' deliveries will be managed as a Middle Tier Acquisition for Rapid Fielding and the Joint Integrated Battle Manager will be developed using the software pathway. The JIBM will provide an integrated command and control layer over proven systems from across the Services such as Aegis, Integrated Air and Missile Defense Battle Command System (IBCS), Command and Control Battle Management Communica-

tions (C2BMC), and Tactical Operations Center—Light (TOC-L) enabling efficient responses to threats without duplication. This integration layer will provide artificial intelligence-optimization algorithms and decision management aids to enhance performance of the joint system against the scale and complexity of the threat. The use of the software acquisition pathway provides flexibility to rapidly design and deliver an open system that will have the ability to be replicated or scaled quickly to other Areas of Operation. This will benefit not only USINDOPACOM, but any Combatant Command providing Commanders with the capability needed to fight and win.

Similarly, as the Department refines its plans for the Golden Dome of America, the investment in the GDS may play a pivotal role informing this strategy. During a recent visit to Guam, the Secretary of Defense emphasized the importance of this approach, stating that 'the Guam Defense System is a model for the Golden Dome.' This alignment underscores the critical role that Guam's defense architecture and command and control integration will play in shaping future U.S. defense initiatives, setting a standard for how we approach and implement integrated defense systems across the Nation. Critical components to the joint architecture that might be shared by both Guam and Golden Dome include MDA's Joint Track Management Capability bridge as a functional joint engagement coordination baseline, joint electronic protection attributes to add resiliency to our sensor network, non-kinetic threat engagement capabilities to preserve high value kinetic interceptors, the integration of the Army's IAMD Battle Command System with MDA's THAAD system to support joint force employment flexibility and the Joint Integrated Battle Management capability that integrates the service and agency C2 systems.

Thank you once again for the opportunity to speak with you today about this critical mission and the joint commitment to the defense of Guam. Your continued support ensures that we remain capable of fighting for and from Guam, meeting the challenges of today and tomorrow.

Senator FISCHER. Thank you, General Resch, and thank you all for your opening statements.

We don't have too many of us here today so we may have more than one round of questions. I will begin the first round.

General Guillot, I have appreciated our past conversations about the need for increased domain awareness, for we cannot shoot what we cannot see. As we look toward Golden Dome and the future of missile defense, what additional improvements need to be made with respect to domain awareness?

General GUILLOT. Madam Chair, I think that what I call the domain awareness layer of Golden Dome is the most critical that we need to have first, for the reasons that you just mentioned. Any chance of using advanced interceptors or defeat capabilities would not be possible if we can't detect and track these threats.

I think that it is a seabed-to-space approach. We need to have undersea sensors to detect submarines that can now get closer to North America than they could before, based on improved stealthiness of those ships. Then a ground layer that can see much further out because of the advanced standoff weapons that our adversaries can now employ. We need an air layer, like the E–7, to close the kill chain with fighter aircrafts or surface-to-air systems, and then a space layer. The space layer would both track airborne moving targets or aircraft, but also systems like Hypersonic Ballistic Tracking Space Sensor (HBTSS) that could track hypersonics, as well as the warning capability that we need to detect the launches to begin with.

Senator FISCHER. Is there anything you can tell us in this setting about Golden Dome and the options that may be available on the sensors and the radar systems that would be used?

General GUILLOT. Madam Chair, I don't know what the Golden Dome will look like, but I suspect that it would be able to use a

lot of the systems that are already in place and currently in development, which would give us a full capability in probably something closer to zero to 5 years, as opposed to something, you know, a decade out into the future. A couple of those systems would be the HBTSS that I just mentioned for the hypersonics, space-based Airborne Moving Target Indication (AMTI), which we have a number of prototype systems on orbit now, over-the-horizon radars which are also operational in, not in the United States, but elsewhere. For instance, the E–7 which many other countries operate.

Senator FISCHER. So given that, how much risk would Golden Dome incur if the Department was forced to vacate the lower 3 Gigahertz (GHz) or a portion of the 7–8 GHz spectrum that it now has?

General GUILLOT. Madam Chair, it is my assessment that we would assume an extraordinarily high level of risk if we lose control of those portions of the spectrum. Many of the systems that we rely on every day today, much less in the future, for Homeland defense, reside in that spectrum range.

Senator FISCHER. Thank you. General Collins, can you provide us with an update on the Hypersonic and Ballistic Tracking Space Sensor, or the HBTSS system?

General COLLINS. Yes, Madam Chair, thank you. So, the Hypersonic and Ballistic Tracking Space Sensor is a prototype program that MDA pursued to prove out the technology such that from space we could close the kill chain on a hypersonic weapon. The focus of that was to prove out that the space system could have the accuracy, the track quality, and get that data into the command-and-control system fast enough to be able to close that fire control loop.

Those two systems, launched in February of last year, have gone through two test bed launches where we had a test bed target launch fly a hypersonic profile, and we have collected data from the sensors during that. So far, we have proven out the timeliness, latency of the fire control loop with those systems, as well as the sensitivity of those systems to close the loop. We are going back with some algorithm updates into the payload to improve on the track quality. But we see that closing as well.

It has been a very successful prototype program, and all along, we have worked in parallel with the Space Force and Space Development Agency. They now have our HBTSS-like requirements as part of their proliferated warfighting space architecture. In the tranches to come in the follow-on years they will slowly be building up an operational hypersonic tracking layer for us.

Senator FISCHER. Thank you. Perhaps in another setting we can talk about a more definitive timeline when that would be available. Thank you.

Senator King.

Senator KING. Thank you, Madam Chair. The nature of my questions may appear to be critical. I am certainly in favor of defending the Homeland against missile attack. No question. My fundamental question is, is it feasible, given today's technology and also the cost involved. I will quote Lincoln: "Your critic is your best friend," so take it in that spirit.

For example, Ms. Yaffe, you mentioned deterrence by denial. Is that really viable today, deterrence by denial? Can we realistically say that we could deny a substantial missile attack from Russia or China, or heaven forbid, both?

Ms. YAFFE. Senator——

Senator KING. I am a great believer in deterrence. I am just not sure deterrence by denial is realistic in this setting. Convince me.

Ms. YAFFE. Senator, thank you for the question. This is meant to be an integrated air and missile defense system that is intended to send a message to the adversary that they may not achieve their objectives. What we want to do is place the burden of escalation on the adversary and demonstrate that it will be harder for them to achieve their objectives in an attack.

Right now, as you are well aware, we do not have a homeland missile defense system that is intended to guard against adversary threats beyond North Korea or rogue State actor threats. Meanwhile, the threats themselves have been expanding significantly, with Russia and China pursuing a breadth of capability——

Senator KING. Well, that is my point. We have developed a Missile Defense Agency essentially to defend against North Korea and Iran and perhaps a rogue, not China and Russia. Now we are talking about an accelerating Chinese pursuit of this capability. Russia already has the largest nuclear stockpile in the world.

What level of scaling up would it take to have a missile defense system capable of providing any realistic deterrent to China and Russia?

Ms. YAFFE. Sir, this is not an answer that will be deliverable overnight. However, what the President has done is challenged us to actually look at what an integrated air and missile defense system of the Homeland would look like, which is not something we——

Senator KING. What does that mean? Is that 1,000 THAAD batteries around cities?

Ms. YAFFE. Sir, I can't weigh in on what the specific architecture would look like. I can't get ahead of what the architecture decision will be that will come out, I think, with the budget. However, it is intended to leverage new technologies to get ahead—we have got, certainly, the lift in the executive order—but to leverage some new technologies both to accelerate the deployment of the HBTSS on the hypersonic side, also to leverage non-kinetics. I know that you are interested in directed energy to see what directed energy might be able to help with, to help us change the cost curve.

But it should be a mix of new technologies that we might be able to demonstrate in the next 4 or 5 years, along with——

Senator KING. What is the assumption——

Ms. YAFFE.—legacy systems.

Senator KING. General Collins, what is the assumption of how many Ground Based Interceptors (GBIs) would have to be launched to knock out one North Korean ICBM?

General COLLINS. Sir, that would be a classified number. We would have to wait until the closed session to answer that.

Senator KING. All right. Well, General Guillot, you mentioned seabed. Isn't that a critical area where we need better sensors, bet-

ter knowledge, and particularly in your Area of Responsibility (AOR), in the Northwest?

General GUILLOT. Senator, absolutely. It is critical, the seabed. Detection and awareness of the seabed and the undersea environment are critical to homeland defense.

Senator KING. The Russians are, in fact, significantly building up their military infrastructure on their shore of the Arctic Ocean. Is that correct?

General GUILLOT. That is correct, Senator.

Senator KING. So that is an area where we have to have better visibility, and also to the west, as the balloon incident told us.

General GUILLOT. Yes, sir. All true.

Senator KING. You mentioned directed energy. The reason for my question, General Collins—and I understand in classified—but those interceptors are about $60 million a copy. I can understand maybe that is a reasonable number if you are talking about a limited capacity of North Korea or Iran, but if you are talking about between now it is 300, up to 1,000 missiles in China, I don't know how many, several thousand, from Russia, the economics don't work. How do you feel about the potential of directed energy, which is about 75 cents a shot once it is installed?

General COLLINS. Yes, sir. We are certainly interested in pursuing directed energy from a missile defense perspective. At this point in time, we are years away from having a capability that would be able to have an effect against an intercontinental ballistic missile. So for the near future we will still very much rely on the layered approaches that we have today for ballistic missile defense.

Senator KING. Define layered approach. You have used that term several times.

General COLLINS. Yes, sir. We look to be able to take multiple engagements on any missile as it is coming in. So in a perfect world we would try to intercept and take out the missile when it is still coming out of the ground and being launched from the enemy territory. That is the boost phase. While it is in space it is midcourse phase, and then as it is coming back into the atmosphere it is the terminal phase.

Today we very much focus on the midcourse for engagements. We would certainly look to be able to try to bring technology to bear that we could get into the boost phase preferred, but then we may also have capabilities, an underlayer of capability, that could be brought to bear to then have a second shot or a second engagement capability while it is in terminal.

So the layers of defense, or defense in depth, is what I refer to when I mention layered missile defense.

Senator KING. I think the prior administration lowered the directed energy budget by a half over the past 4 or 5 years. I think that was a terrible strategic mistake. I hope this Administration will remedy that, because you mentioned it is going to be years. One way to make it months instead of years is to devote more resources to the research and development of that capability, which it seems to me is clearly the technology of the future in this field.

Thank you, Madam Chair.

Senator FISCHER. Thank you, Senator King. Senator Tuberville.

Senator TUBERVILLE. Thank you. Sounds like a guessing game to me, a lot of things that are going to happen, and of course, I don't know how many missiles could reach our mainland that they have right now, but obviously space is going to decide a lot of that, with missiles coming from space in the near future.

But that being said, General, how are we doing on Guam? We got the Aegis system started, what, about 3 years ago, maybe a little less? How are you doing? Getting better?

General RASCH. Senator, getting better. Lots of teamwork across the services and with Missile Defense Agency, and my hat goes off to General Collins and his team who really led the Department of Defense in early implementation, all the legwork for laying the ground efforts for the military construction that occurred there.

MDA demonstrated this last year early Aegis Guam capability with a flight test that was executed there, very successfully. That work was really the starting point. That equipment has stayed onsite. It offers a credible deterrence against potential adversaries, while the Army then does its planning to come in, in the 2027 timeframe, with the next, what we call tranche one of capability for Guam.

It is a lot of consensus building. It is a lot of teamwork across the Department of Defense. This is the Homeland, so, in in several ways, we are learning a lot of lessons that we believe can also apply to the Golden Dome team as they continue that mission set. But very optimistic that the Army is going to meet its mission, that will have a credible capability on island in the timeframe we lay out.

Senator TUBERVILLE. Have we decided who is going to operate it?

General RASCH. Well, that decision, as we build out the overall command and control capability, the C2 for the defense of Guam would typically fall to the Air Force to conduct that overall coordination. But it will be manned jointly as we have both Navy systems, Air Force systems, Army systems on the ground. We will have, you know, servicemen and women from all of those services operating it typically under an Air Force leadership who will then report to the combatant commander, Admiral Paparo.

Senator TUBERVILLE. Does that include Reserve, National Guard?

General RASCH. Sir, it absolutely can. Even with the small footprint the Army has had on island today with the Task Force Talon, which is the THAAD battery, we have relied heavily on the Guam National Guard who provides a security force for that unit that is operating away from a typical Army base. A great job of those soldiers, supporting that mission truly defending the Homeland. Within the Army, there is talk about potentially expanding that mission set for the Guard members on Guam. It is still under discussion, so I can't get ahead of those decisions as they play out. But I believe all things are on the table at this point.

Senator TUBERVILLE. Thank you. I know it is a long process, a long process. I mean, how many years do you think we have got left to be fully operational?

General RASCH. Senator, I believe we will be improving this capability forever, and defense never rests because offensive threat never rests. So, we will continually evolve. The point of our effort is to try to get as much capability as soon as possible, and capa-

bility isn't just a thing. It is not just, you know, a launcher. It is not just a radar. It is not even just a command and control. It is soldiers, you know, airmen, you know, all the folks actually manning this equipment, ensuring they are properly trained. It is ensuring that we have the proper sustainment tail on island to support it, that we can sustain it not just for a day, but for years in time. So, we will be at this for a while.

Senator TUBERVILLE. It is like defending a different offense every week, if you are a football coach. You have got to change, don't you?

General RASCH. Absolutely, Senator.

Senator TUBERVILLE. Thank you. General Collins, thank you for the footprint you have in my State of Alabama at Redstone Arsenal. We are proud of all the work you are doing. How much of MDA's effort and investment in Golden Dome do you expect to take place in Huntsville? Do you expect to request any additional resources for maintenance or buildings or anything like that in the future?

General COLLINS. Well, Sir, Missile Defense Agency is really proud of being part of the Tennessee Valley and that Redstone Arsenal. Certainly, a large contingent of our workforce is at Redstone Arsenal, and as well as many of our industry partners are in that area, as well.

I can't give you an exact percentage, but certainly the engineers, the program managers, the contracting officers, the entire workforce of Missile Defense Agency and the associated industry members are going to be very busy and very devoted to making any of the parts of Golden Dome real.

Senator TUBERVILLE. You are building things right now too, right? You have got things under construction, I think the last time I was there.

General COLLINS. Yes, sir. We are doing them. We are in the middle of a ground test facility infrastructure update, which is a fairly large renovation and construction project that is going on. That is going on right now, to help get us ready for the ground test infrastructure we need to support next gen missile defense. As we start digesting and dissolving the Golden Dome requirements, there may be additional requirements that we need to make sure we are ready to go.

Senator TUBERVILLE. I got one more question, if we got time here. General Collins, I want to ask you about our space-based sensors, which is an absolutely critical component of any effort to develop the next-generation missile defense capability. Last year, the U.S. put a new hypersonic and ballistic tracking space sensor satellite in orbit. Do we have any plans, either as part of the Golden Dome architecture or independently, to expand that capability?

General COLLINS. Yes, sir. We, as well, believe that a very effective and resilient space layer is going to be critical to the future missile defense requirements of the Homeland as well as our deployed forces. We rely on space assets today as part of our kill chain for initial tip-off, and we will continue to do that.

The Space Force, Space Development Agency, will operationalize the HBTSS capability. The relationship we have with Space Force is we may prototype technology that is required and prove it out

for missile defense. The Space Force will operationalize that capability as we move forward, and HBTSS will be foundational. That type of technology will be foundational to hypersonic missile defense in the future. We are working on future prototyping space sensor capabilities, in particular, discriminating space sensor to help improve ballistic missile defense in the future as well. We will prototype and Space Force will operationalize. Space will be very key to protecting the Homeland and our deployed forces in the future. Thanks, Senator.

Senator TUBERVILLE. Thank you. Mr. Chairman.

Senator FISCHER. Thank you, Senator Tuberville.

General Rasch, when you look at the defense that Guam is going require, you and I, earlier today, we had a conversation about that and the importance of integrating those systems—Army, Navy, MDA.

My Co-Chair talked about directed energy and how important the uses of that could be, and it would be a lot cheaper. But, can you compare the systems that we need to integrate for the defense of Guam specifically, and some of the challenges that we face looking at directed energy and the capabilities it has in some more adverse conditions that are out there, maybe not always ready, and the different options it provides you and your soldiers with as you look toward defending that island?

General RASCH. Madam Chair, absolutely, and thank you for the question. As we spoke earlier, the new thing that we are doing for Guam is not just putting the individual material systems and programs on island, but really taking the first step at integrating the command and control functions. So Air Force has a system, Tactical Operations Center (TOC) Light. The Navy has their Aegis system, which will be Aegis Guam. Missile Defense Agency has Command, Control, Battle, Managment Communications (C2BMC), and the Army has the Integrated Air Missile Defense Battle Command System, IBCS. These are four separate systems that loosely interoperate now, but we believe that is not good enough in the long term. So we are integrating these with a layer of decision support on top of the Joint Integrated Battle Manager.

This capability will leverage a lot of the work that Missile Defense Agency has done to date in that single integrated air picture arena, of getting a common air picture with those systems, and then providing a layer of decision aids on top, so that the decision-making, who has got a hard decision to make on a potential threat, can actually do fire direction to the appropriate system that actually has a killing capability.

So that is the new work that we are doing for Guam from a command and control or fire control perspective.

With regards to directed energy, as General Collins said, the technology is evolving, and the Army, I know, has invested a lot in ground systems from a directed energy perspective. We have deployed several of those systems overseas to get continued operational assessment. For the defense of Guam there is the potential, as those technologies continue to evolve, to be integrated in as part of this architecture.

Realizing, though, that directed energy is not a panacea. As you pointed out, there are days, good days and bad days, for lasers.

Weather can affect their lethality. It can affect the range. So, as we continue to learn about this technology and what its capability is, we also have to ensure that we integrate the atmospherics at the time. You know, as you get closer to the Earth the air is dirtier. Windy days create dust, which can reflect or refract the light. Moisture can do the same thing, if it is raining.

So having a mix of capabilities, and that the soldiers that are operating that integrated system understand basically how good the laser is today. The ranges of those directed energy systems are not out at the ranges of our more exquisite and expensive missile systems are.

So we have to build that trust with the soldiers, that if they let a threat getting closer, to allow directed energy to be the effector, that it is going to work. So that is something that the Army, I know, was working at lower powers, necessarily, than we would put on Guam, but starting down that venture now, and we are looking forward to seeing where that technology takes us.

Senator FISCHER. Thank you, General.

Senator Kelly, you are recognized.

Senator KELLY. Thank you, Madam Chair. General Collins, so last year Missile Defense Agency proposed termination of the Standard Misile-3 (SM–3), and months after that termination recommendation that missile was used in defense of Israel against ballistic missiles. So based on the recent combat experience with the SM–3, and I am not sure exactly what the number of rounds that were fired, but what is the current plan for the SM–3 going forward? Has that plan been reevaluated?

General COLLINS. Thanks, Senator, for that question. Certainly in last year's hearing we certainly talked about the decision, the fiscal decision that was made to terminate the SM–3 Block 1B line. Since that, you are very right, it has been a workhorse in the Eastern Mediterranean, protecting the citizens of the State of Israel.

As we now are planning with the increased focus on missile defense of the Homeland and missile defense in general, the future decision space within the SM–3 program is being re-looked at, as part of the deliberations for Golden Dome, and, as well, with the President's budget that is in development.

What I would also, though, say is through a number of supplementals we do appreciate the support that has come through supplemental funding that has come back to replenish the SM–3 1B lots that were expended in the Eastern Med, and we will continue to track that very closely with both the Block 1B and the Block 2A's, moving forward.

Senator KELLY. Do you know how many rounds were fired, SM–3 rounds?

General COLLINS. I do not have the latest but it is in the dozens.

Senator KELLY. The SM–3 line has not been shut down at all, so it sounds like, in fact, the rate of production has increased.

General COLLINS. The rate of production is still continuing. We still have fiscal year 2024 and fiscal year 2025 plus the supplemental funding that still will go on contract before the end of this year. So that line will still remain open for years into the future. It takes a few years from beginning to end to get those rounds out.

The funding decisions, though, are here and now, to make sure that we continue to keep that line open and viable as we move forward.

Senator KELLY. Go back to last year when the decision was made to terminate production of SM–3. What was the plan for the follow-on missile that would perform the duties of the SM–3?

General COLLINS. Sir, there was not a plan set forward on a replacement for the SM–3 1B. It was to rely more on the Block 2A line, which is a larger, more expensive missile, but the quantity production rates were lower for that missile. But that was the decision.

Senator KELLY. General Rasch, I appreciate all the work you and your team have done on the Guam defense system. I am interested in hearing any lessons from Guam Defense that can be applied to Golden Dome as we come up with a plan. I know the study has been, well, the timeline for the 60-day study is complete. But anything that informed that study from Guam Defense?

General RASCH. Senator, thank you for your question, and absolutely lessons learned. Guam, being part of the Homeland, provides a lot of the same challenges that we will have here at Continental United States (CONUS). Interagency cooperation and coordination will be required. We have certainly learned that on Guam, so it is not just a DOD venture. It is bringing in the whole-of-government as far as site locations, environmentals, everything that we have to do there. We have certainly shared that across with the teammates as they are thinking about the Golden Dome, the Golden Dome challenge.

The other area that I believe is significant is the integration of our command and control systems. Our services have typically fought the air missile defense threat as stovepipes, and so our work to do that level of integration, for at least the land piece of those systems, from the Army, the Navy, the Air Force, and Missile Defense Agency, to start the integration of that, absolutely should be a model, or at least a starting point for how we take on the bigger challenge of developing and air missile defense capability across the entire continental U.S.

Senator KELLY. Ms. Yaffe, on the 60-day study, I know the report has gone to the White House. I don't know if the President has signed off on it yet. It doesn't sound like it. But I want to just hear, if you can speak to what kind of preliminary activities have been accomplished and anything you can say about what you have discovered in the 60-day study.

Ms. YAFFE. Sir, thank you. I think I can say broadly, as you know, this executive order really challenged the Department to take this integrated approach in a really unprecedented way that would require the breaking down of silos to be successful.

When it came into the building, our office, the Office of the Secretary of Defense, joining with Joint Staff to bring together all of the stakeholders and start working on different design options, we matured them to a place where the technical experts took over and really refined them into a few different options to bring to the Secretary.

My understanding is the Secretary of Defense and other Department leaders have engaged with the President, and the hope is

that there will be an announcement soon, certainly tied with the budget. There was a breadth of options looked at that tied the new and potential ways to accelerate developmental capabilities to get some demonstrations with the existing capabilities, so that we can have an integrated, layered system.

Senator KELLY. Okay. Thank you.

Senator FISCHER. Thank you, Senator Kelly. Senator King you are recognized.

Senator KING. General Rasch, I am very interested in Guam as a test bed, which has been discussed repeatedly in this hearing. My question is, how much has the development of missile defense infrastructure on Guam cost?

General RASCH. Senator, that is a good question, and obviously one that gets a lot of interest because there tends to be a conflating of different costs to support overall the island of Guam. Obviously still recovering from a horrible typhoon a few years ago. There are dollars that the DOD is investing in fixing things that were damaged.

Senator KING. No, I understand that. But can the defense piece that you have discussed here today, be isolated and identified? Somebody must know what it has cost.

General RASCH. Yes, Senator, it can, and we have estimated that at about an $8 billion investment. Not new investment but really it is the cost of the systems that the services were building already that will now be located at Guam, approximately $8 billion across all of the services when you look through the overall cost of the individual components.

Senator KING. I find that concerning because I just did a calculation here, 779 cities in the United States with more than 50,000 people. In fact, Guam is half the size of San Antonio. So if we are talking about providing the level of defense that we have on Guam for our citizens in our country, we are talking about an awful lot of money. I can't do the math in my head, but 800 times $6 billion is a pretty astronomical cost.

Again, as you can tell, I am skeptical. I want to be proven wrong. I look forward to future hearings and discussions and seeing how Golden Dome evolves. The question is, is it the best place to put our money, or should we be developing our deterrent capability and accelerating the reconstruction of the Triad as a more effective deterrent than one that looks like it has some technical and financial questions.

But I think the next time we have this hearing we probably will have some more answers about what Golden Dome actually looks like. Don't get me wrong, I am all for protecting the Homeland. It is just a question of how much will it cost relative to other defense needs and how effective can it be technologically, given the development of things like hypersonics, maneuverable missiles that, as you know, General Guillot, are below the level of traditional sensors and much more difficult to intercept.

I look forward to continuing this discussion, and certainly I hope, Madam Chair, that as soon as Golden Dome is more formulated we can have a hearing to discuss its components.

Senator FISCHER. Thank you, Senator King. I agree with you. I believe Golden Dome is part of the mix and the options that are

out there as we look at the defense of our Homeland, and specifically in the Indo-Pacific with Guam, as well. We have heard from a number of our panelists at posture hearings but also in classified briefings that the Administration has followed previous administrations in putting the top priority on our Triad, on modernization, on making sure that the President will have options there, as well.

So I look forward to seeing, with you, how Golden Dome is going to be able to fit in the mix, along with hypersonics and many other options that are going to be available in the future.

With that I thank the panel for being here today. Senator King and I need to get down and vote. But we thank all of you for your dedication, for the time you give us here in the Senate, and on this Subcommittee especially, and the information you provide us. Thank you.

We are adjourned.

[Whereupon, at 5:34 p.m., the Subcommittee adjourned.]

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR TOM COTTON

REQUIRED RESOURCES

1. Senator COTTON. General Collins, will you be advocating for a significantly bigger budget to effectively implement Golden Dome?

Lieutenant General COLLINS. Beginning with fiscal year 2026 President's Budget requestfor fiscal year , the Missile Defense Agency future budget requests will include the requisite funding to effectively support the implementation and integration of the Golden Dome architecture.

GOLDEN DOME DIPLOMACY

2. Senator COTTON. General Collins, how will the Golden Dome architecture provide a stabilizing force between the United States and its adversaries, by providing the freedom of maneuver to respond to an attack?

Lieutenant General COLLINS. The Golden Dome architecture provides a stabilizing force between the United States and its adversaries by presenting a formidable missile defense system. It is in response to years of adversaries' developing advanced capabilities to threaten our security and the increasingly unstable situation that they have created. Robust defenses raise the stakes for adversaries and introduce significant uncertainty and complexity into their attack planning, ultimately undermining their confidence in a successful outcome. Combined with the United States' enhanced ability to deter through punishment, missile defenses disincentivize, and reduce the likelihood of, a contemplated armed attack on the United States.

Should deterrence fail, a robust national missile defense system would limit the damage inflicted on the United States' population, infrastructure, and retaliatory capabilities. This, in turn, would afford the President more time and flexibility in decisionmaking, safeguard offensive options from destruction, and potentially facilitate de-escalation. If the Golden Dome architecture is not developed to address advancing missile threats, U.S. options during crisis escalation could be significantly curtailed.

GOLDEN DOME MAGAZINE REQUIREMENTS

3. Senator COTTON. General Collins, how much is successful intercept of advanced threats a function of capabilities versus arsenal size, and how do you balance that?

Lieutenant General COLLINS. The response contains sensitive information and will be provided to the requestor by other means.

QUESTIONS SUBMITTED BY SENATOR JIM BANKS

SPACE SENSORS

4. Senator BANKS. Ms. Yaffe, President Trump has made the implementation of a Golden Dome missile defense system a priority. The need for a defense system

with the ability to neutralize the threat of ballistic, hypersonic, and cruise missiles is essential to national security. How can Congress help revitalize the defense industrial base and its supply chain to help accelerate and deploy a Space-Based Sensor Layer for Golden Dome?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

HYPERSONIC AND BALLISTIC TRACKING SPACE SENSOR

5. Senator BANKS. Ms. Yaffe, the President's Executive Order (EO) directs the acceleration of the deployment of Hypersonic and Ballistic Tracking Space Sensor. With the likelihood of the Department of Defense operating under a continuing resolution (CR) throughout the entirety of the calendar year, how will this affect the timing of Golden Dome initiatives?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

ACQUISITION POLICY—LEAD AGENCY

6. Senator BANKS. Ms. Yaffe, as we look to accelerate the implementation of the Golden Dome, which specific agency of the Department intends to lead the acquisition process?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

7. Senator BANKS. Ms. Yaffe, if no single agency will lead the process, what aspects of the process does the Department plan to be led by which agencies?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

QUESTIONS SUBMITTED BY SENATOR MAZIE K. HIRONO

MISSILE DEFENSE OF HAWAII

8. Senator HIRONO. General Guillot, the President's recent missile defense Executive Order tasks you with providing "an updated assessment of the strategic missile threat to the Homeland". I remain concerned about the viability of the Department of Defense's (DOD) strategy to defend Hawaii from missile threats. Will you commit to include the missile defense of Hawaii as part of your assessment?

General GUILLOT. Yes, in coordination with USINDOPACOM, I will include missile defense of Hawaii in my assessment.

MISSILE DEFENSE RESOURCING

9. Senator HIRONO. General Guillot, our adversaries are investing heavily in advanced air and missile systems that threaten the United States and require increased investments in missile defense capabilities. How is United States Northern Command (NORTHCOM) coordinating with United States Indo-Pacific Command (INDOPACOM) to ensure the missile defense of Hawaii?

General GUILLOT. USNORTHCOM is responsible for the Ballistic Missile Defense of Hawaii and routinely conducts exercises to ensure a high level of proficiency. We also have well-established processes with USINDOPACOM to share information on potential threats and our Ballistic Missile Defense posture.

10. Senator HIRONO. General Guillot, will you commit to working with my office to ensure that Hawaii is protected as part of the implementation of the Golden Dome EO and additional architecture?

General GUILLOT. Yes, I commit to ensuring Hawaii is protected as part of the Golden Dome Executive Order.

11. Senator HIRONO. General Guillot, between January 20 and April 8, the U.S. military flew 46 flights that carried migrants on military aircraft. These flights lasted 802.5 hours, at a cost of approximately $21,087,300, according to information provided in response to congressional Requests for Information. As the operational leader for the border mission, how is NORTHCOM's expanded border security and mission impacting resourcing for the missile defense?

General GUILLOT. I am not aware of the border mission having any impact on missile defense resourcing. Both missions are priorities for the Department of De-

fense, and NORAD and USNORTHCOM do not anticipate one mission competing for funding with the other.

GROUND-BASED SENSORS

12. Senator HIRONO. Lieutenant General Collins, how is the Department integrating commercial ground-based sensors in the Golden Dome architecture and leveraging the Joint Global Hypersonic Operational Sensor Tasking program sponsored by the Missile Defense Agency to identify promising commercial sensors that could augment the current integrated air and missile defense architecture?

Lieutenant General COLLINS. [Deleted.]

ENGAGEMENT WITH NON-TRADITIONAL COMPANIES

13. Senator HIRONO. Lieutenant General Collins, how is the Missile Defense Agency (MDA) improving communication and transparency with non-traditional companies as part of the Golden Dome program?

Lieutenant General COLLINS. The MDA is prioritizing a greater focus on research and development with nontraditional defense contractors. MDA will work directly with the Director of GDA on efforts in which communication and transparency will be critical to rapidly developing missile defense technologies and capabilities.

ENGAGEMENT WITH ALLIES AND PARTNERS ON MISSILE DEFENSE

14. Senator HIRONO. Ms. Yaffe, how are you increasing engagement with allies and partners, particularly in the Indo-Pacific, on missile defense?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

15. Senator HIRONO. Ms. Yaffe, what type of cross-DOD and interagency coordination is the Under Secretary of Defense for Policy (USD(P)) pursuing and leading to this end?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

MISSILE DEFENSE OF HAWAII

16. Senator HIRONO. Lieutenant General Collins, will you commit to working with my office to ensure that Hawaii is protected as part of the implementation of the Golden Dome EO and additional architecture?

Lieutenant General COLLINS. I am committed to protecting the homeland, which includes Hawaii. In coordination with the Director of GDA, I will work with your office on matters related to implementing GDA.

QUESTIONS SUBMITTED BY SENATOR ELIZABETH WARREN

GOLDEN DOME

17. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, what is DOD's estimate or range for the cost of deploying the so-called "Golden Dome" or a similar system across the entire United States? Please describe your methodology for the estimate or the source.

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. The Administration recently announced a potential cost of $175 billion for Golden Dome for America over a period of 3 years. The Department of Defense closely coordinated with the Services and the Missile Defense Agency to develop cost estimates, and I defer to the Department regarding the methodology for this estimate.

Lieutenant General COLLINS. The Director of GDA is responsible for establishing requirements that will inform future cost estimates.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

18. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, please describe the process the DOD will use to estimate the costs of Golden Dome.

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. NORAD and USNORTHCOM are primarily responsible for establishing operational requirements for executing the commands' assigned missions. The recently established Direct Reporting Program Manager, in coordination with the Services and Missile Defense Agency, will lead the process for estimating costs.

Lieutenant General COLLINS. The Director of GDA is responsible for establishing requirements that will inform future cost estimates.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

19. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, please describe the process the DOD will use to provide program justification for Golden Dome.

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. NORAD and USNORTHCOM are primarily responsible for establishing operational requirements for executing the commands' assigned missions. I would defer to the Department regarding the Department's processes for program justification.

Lieutenant General COLLINS. There will be primary programs aligned to the DRPM of GDA as well as GDA contributing to programs existing in other services portfolios. Many MDA programs will be a primary resource for executing the GDA program and this differentiation will be outlined in PB27 budget documentation.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

20. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, please describe the process the DOD will use to assess and determine the technological feasibility of Golden Dome.

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. NORAD and USNORTHCOM are primarily responsible for establishing operational requirements utilizing an Initial Capabilities Document. The recently established Direct Reporting Program Manager, in coordination with the Services and Missile Defense Agency, will lead the process for estimating technological feasibility.

Lieutenant General COLLINS. Twenty years of advancements in U.S. missile defense technology, as well as recent successful deployments to protect allies and partners, have demonstrated the technological feasibility of our systems. Building on these successes, GDA will require next-gen investments and integration across the DoW components to realize the full GDA architecture.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

21. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, would DOD cut, delay, or reduce the scope of any existing missile defense programs that may duplicate Golden Dome capabilities? Please describe which existing programs could be considered duplicative and whether they would be cut, delayed, or reduced in scope.

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. NORAD and USNORTHCOM have not identified duplicative capabilities requiring cuts, delays, or reduction in scope. In fact, the commands have advocated for earlier operationalization of identified capabilities to meet operational requirements. NORAD and USNORTHCOM will continue to work with the Golden Dome Direct Reporting Program Manager to support the Department's effort in delivering a capable and cost-effective defense system.

Lieutenant General COLLINS. The Director of GDA is responsible for establishing requirements that will inform future cost estimates. In this capacity, he will identify the contributing programs for inclusion within the system-of-systems GDA architecture.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

22. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, given that the Israeli Iron Dome is designed to intercept slow, short-range threats, is there a technical plan to adapt that system into one that can counter more advanced missile threats possessed by the United States's adversaries?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. Israel's Iron Dome is just one system within Israel's Integrated Air and Missile Defense (IAMD) network. Similarly, Golden Dome for America (GDA) will also be an IAMD network designed to counter the entire spectrum of current and evolving air and missile threats. It is imperative to have comprehensive domain awareness and integration within and across the layers of the GDA architecture to protect a larger area against more advanced threats. Unfortunately, the scope and scale of threats GDA must defend against is likely to make a direct adaptation of Israel's IAMD network, including Iron Dome, infeasible.

Lieutenant General COLLINS. The GDA will use a system-of-systems approach leveraging new and existing U.S. missile defense capabilities to detect and defend against ballistic, hypersonic, and cruise missiles, as well as other next-generation aerial threats from peer, near-peer, and rogue adversaries.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

23. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, how much would such adaptations cost?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. NORAD and USNORTHCOM are responsible for establishing operational requirements for Golden Dome. While I defer to the Department regarding estimated costs, and the adaptation of Israeli systems is likely infeasible, the commands will continue to work with the Golden Dome Direct Reporting Program Manager to support the Department's effort in delivering a capable and cost-effective defense system.

Lieutenant General COLLINS. he Director of GDA is responsible for establishing requirements that will inform future cost estimates.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

24. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, what is the estimated timeline to field an operational system for Golden Dome?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. The President's has directed the Department to deliver a capability within 3 years, and NORAD and USNORTHCOM are supporting the Golden Dome Direct Reporting Program Manager and the Services efforts to meet that directive.

Lieutenant General COLLINS. The Director of GDA is responsible for establishing requirements that will inform future program schedules.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

25. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, how confident are you that an operational system for Golden Dome could be fielded within 5 years?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. I am quite confident that 5 years is an achievable timeline. USNORTHCOM and NORAD currently operate the Ground-based Midcourse Defense system and the National Capital Region Integrated Air Defense System, both of which will integrate with additional Golden Dome capabilities, and additional capabilities are available now and ready for operational use when funded. Other capabilities require some technical development but have a viable path for delivery within 5 years, within the directed timeline.

Lieutenant General COLLINS. The Director of GDA is responsible for establishing requirements that will inform future program schedules.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

26. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, are you aware of any analysis of alternatives or similar studies completed or underway for the Golden Dome program? Please provide any completed analyses and estimated timelines for competing analyses underway.

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. Yes. In collaboration with the Missile Defense Agency and the Services, NORAD and USNORTHCOM have supported past studies and analysis, including Air and Cruise Missile Defense of the Homeland, layered homeland defense, and ballistic missile defense sensor architecture. The Department is leveraging those analyses to help inform the Golden Dome for America (GDA) architecture development and is continuing to conduct analysis in support of the GDA architecture and its cost. I would defer to the Department regarding the release of those analyses and timelines for those currently underway.

Lieutenant General COLLINS. The GDA architecture is being built on a foundation of over 40 years of development and fielding of U.S. missile defenses and recent successful demonstrations of missile defense capabilities protecting allies and partners. In the near term, the fiscal year 2025 reconciliation package has identified resources that would buttress this existing foundation with additional studies and analysis.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

27. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, in the 1990's, it was determined that space-based missile defense (SDI or "Star Wars") was too technically challenging and prohibitively expensive. What are the greatest technological challenges facing a Golden Dome system?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. I believe the key technological challenges for a Golden Dome for America system include integrating multiple defense layers (such as radars, interceptors, and directed energy) across vast geographical areas; handling the high cost of interceptors versus relatively inexpensive threat systems such as UAVs; and ensuring resilience against cyberattacks and electronic warfare. The system is also likely to require advanced AI for real-time target discrimination and coordination, as well as the need to overcome environmental limitations such as weather effects on directed energy weapons and power requirements for continuous operations. With that said, many of the NORAD and USNORTHCOM requirements for homeland defense, including increased all-domain awareness, are currently available and could be integrated into existing defense networks within a zero-to-three-year timeframe.

Lieutenant General COLLINS. The GDA will use a system-of-systems approach that leverages new and existing U.S. missile defense capabilities to deter and defend against ballistic, hypersonic, and advanced cruise missile, and other next-generation aerial threats from peer, near-peer, and non-State adversaries. Large-scale integration and next-gen capability investment across the DoW will be required to successfully develop and deploy GDA.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

28. Senator WARREN. Lieutenant General Collins and Lieutenant Gen Rasch, former Under Secretary of Defense for Research and Engineering Michael Griffin and former Deputy Under Secretary of Defense for Research and Engineering Lisa Porter, who both served during the first Trump administration, contend that the MDA is not structured to lead an effort of Golden Dome's magnitude. Do you agree with their assessment?

Lieutenant General COLLINS. The Director of GDA is responsible for establishing requirements that will inform future cost estimates and schedules. MDA was identified as the systems-of-systems engineering and global test execution lead for the integrated GDA architecture.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

29. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, former officials Michael Griffin and Lisa Porter also contend that the Golden Dome program management should not be performed within any existing agency. Do you agree, and if so, should a new agency be created to manage this program?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. While I respectfully defer to the Department on matters of policy, NORAD and USNORTHCOM are committed to working closely with the Direct Reporting Program Manager and other partners to define requirements for Golden Dome capabilities in support of homeland defense.

Lieutenant General COLLINS. The MDA will work directly with the Director of GDA to manage GDA.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

30. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, do you believe Golden Dome would require an entirely new approach to command and control?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. The increased scope and scale of the air and missile defense mission will place a greater emphasis on timely and seamless command and control integration across geographic regions, mission areas, the Interagency, and with Allies and Partners. I do not believe this would represent an entirely new approach to command and control. The Department has considered this more expansive approach in the Joint All-Domain Command and Control concept, as well as the work being done for the defense of Guam. NORAD and USNORTHCOM, along with all of our partners, will leverage these efforts to the greatest extent possible in the command and control approach to Golden Dome.

Lieutenant General COLLINS. The Director of GDA is responsible for establishing requirements that will inform future architectures.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

31. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, is there a possibility that adversaries who see the U.S. investment in a Golden Dome begin to adapt their offensive forces in response?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. Yes, U.S. adversaries are likely to adapt their offensive forces in response to the U.S. Golden Dome initiative in an attempt to ensure their ability to hold the U.S. Homeland at risk.

Lieutenant General COLLINS. The GDA is required because peer and near-peer competitors of the United States have been advancing their offensive capabilities for decades in order to hold us at risk and/or prevail during armed conflict.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands,

the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

32. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, have DOD or U.S. intelligence agencies assessed how our potential adversaries are likely to respond to the development and deployment of Golden Dome? If so, please summarize what the DOD or intelligence agencies found to be the likely reaction to the Golden Dome options.

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. Yes, the National Intelligence Council published a Top Secret-level assessment of China's and Russia's likely reactions to the United States Golden Dome initiative on March 12, 2025. The product, serial number NICM 2025–07785–A, was coordinated with multiple DOD agencies and commands—including NORAD and USNORTHCOM.

Lieutenant General COLLINS. The GDA is required because peer and near-peer competitors of the United States have been advancing their offensive capabilities for decades in order to hold us at risk and/or prevail during armed conflict.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

33. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, if DOD does not have an assessment of how potential adversaries would respond, when will DOD conduct one?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. Multiple DOD agencies and commands—including NORAD and USNORTHCOM—coordinated on and concurred with the National Intelligence Council's March 12, 2025 assessment of China's and Russia's likely reactions to the United States Golden Dome initiative (NICM 2025–07785-A). In addition, the Secret-level version of the Defense Intelligence Agency's February 19, 2025 assessment on "Strategic Missile Threats to the U.S. Homeland" (DIA—F—25I85-C) contains a similar assessment of our adversaries' likely reactions.

Lieutenant General COLLINS. I defer to my colleagues in the Intelligence Community when an assessment should be conducted. When it is, MDA will participate as requested and appropriate.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

34. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, once DOD has an assessment of how potential adversaries would respond, will you commit to sharing those results with the Senate Armed Services Committee?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. The National Intelligence Council's Top Secret-level assessment of China's and Russia's likely reactions to the United States Golden Dome initiative (NICM 2025–07785-A, published March 12, 2025) is available on CIA's "WIRe" website. The Secret-level version of the Defense Intelligence Agency's February 19, 2025 assessment on Strategic Missile Threats to the U.S. Homeland (DIA—F—25I85-C) contains a similar assessment of our adversaries' likely reactions (beginning on page 31) and is available on DIA's "Source" website. Additionally, I commit to sharing my perspective on how USNORTHCOM intends to counter the threat.

Lieutenant General COLLINS. I will share my views on the assessment's implications for MDA's efforts on missile defense capability development.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

35. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, do the architecture options and cost estimates provided by the DOD to the President take into consideration the need to respond to the likely reactions of potential adversaries to each option?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. While I defer to the Department regarding its development of cost estimates, NORAD and USNORTHCOM are certainly considering current and future threats in developing requirements for the Golden Dome architecture.

Lieutenant General COLLINS. The Director of GDA is responsible for establishing requirements that will inform future cost estimates and architecture options.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

36. Senator WARREN. Ms. Yaffe, how much does DOD estimate a missile from Iran, North Korea, Russia, China, and any other potential adversary costs to produce?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

37. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, how much more expensive is a U.S. interceptor for Intercontinental Ballistic Missiles (ICBM) (whether the existing ground-based interceptor, the sea-based SM–3 Block IIA, or the future Next-Generation Interceptor) compared to Chinese or Russian ICBMs, roughly?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. I would respectfully defer to the intelligence community for information regarding the cost of adversary weapons systems. However, NORAD and USNORTHCOM are well aware of the need to pursue lower-cost defensive capabilities and remain ahead of the "cost curve" as competitor capability and capacity increases.

Lieutenant General COLLINS. The cost of defensive interceptors is greater than the cost of adversary ICBMs. The cost of allowing a nuclear weapon to detonate in a population center, however, would be hundreds of thousands of fatalities and hundreds of billions of dollars of damage. The existing GBIs' cost is on the order of $100 million per round (including cost of the recent Service Life Extension Program). Next Generation Interceptors are estimated to cost on the order of $140 million per round, and SM–3 Block IIA are on the order of $25 million per round.

Lieutenant General RASCH. This question is best answered by the Missile Defense Agency.

38. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, DOD's 2024 Annual Report on Military and Security Developments Involving the People's Republic of China states at several points that China "may be exploring development of conventionally armed intercontinental range missile systems". General Guillot has testified before the House that China may be developing a conventionally armed ICBM. Why would the existing Ground-based Midcourse Defense system, designed to defend against the North Korean ICBM threat, not be sufficient for addressing this Chinese conventionally armed ICBM problem?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. The current Ground-based Midcourse Defense system was designed and deployed to defend against ICBM threats from rogue nations such as North Korea. China's advanced long-range missiles create geometry, capability, and capacity challenges that North Korean missiles do not match. NORAD and USNORTHCOM are working with the Department to ensure that the capabilities of the Golden Dome, including the Next Generation Interceptor, are able to defend against the full spectrum of current and future intelligence-assessed threats.

Lieutenant General COLLINS. The missile defense system can engage and destroy a limited number of nuclear or conventional ICBMs launched from China but would become depleted when faced with a quantity of adversary ICBMs larger than that of North Korea.

Lieutenant General RASCH. This question is best answered by the Missile Defense Agency.

39. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, did the DOD assess how each architecture option provided to the president for Golden Dome is compatible with the president's stated goal of seeking "denuclearization" agreements with Russia and China? If so, please

describe what the Department's conclusion was about the effect Golden Dome would have on this Presidential priority.

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. I respectfully defer to the Office of the Undersecretary of Defense for Policy regarding the Department's assessments. NORAD and USNORTHCOM, along with USSPACECOM, the Missile Defense Agency, the Services, and other stakeholders, provided input and advice to the Department throughout the development of the Golden Dome for America architecture and remain fully aligned with the Department's approach to defending the Homeland.

Lieutenant General COLLINS. Consistent with one of the President's stated policy goals for pursuing GDA, our missile defenses will help to ensure our Nation's second-strike capability, thus diminishing an adversary's perceived benefit of using nuclear weapons to attack the United States. Decreasing the utility of nuclear weapons can put us on a path toward denuclearization.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

40. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, the Congressional Budget Office (CBO) recently estimated that it would cost between $160 and $540 billion to deploy and maintain for 20 years a boost-phase interceptor constellation that would protect the United States from the North Korean threat of a decade ago. The CBO warns, however, that costs of a program relevant to today would likely be higher. Do you still believe boost-phase intercept is the most cost-effective way to utilize space-based interceptors?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. I respectfully defer to the Department and U.S. Space Command regarding the costs related to space-based capabilities.

Lieutenant General COLLINS. The Director of GDA is responsible for establishing requirements that will inform future cost estimates and architecture options.

Lieutenant General RASCH. This question is best answered by NORTHCOM.

41. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, in the defense portion of the reconciliation bill, the majority has proposed to appropriate $25 billion for Golden Dome missile defense programs. Because some of these programs, notably the $5.6 billion proposal for a space-based intercept capability, are entirely new concepts, it is not clear that a large influx of research, development, test, and evaluation funding in the first fiscal year would be appropriate. What are DOD's plans for allocating the reconciliation funds, if they materialize, over the next 4 years?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. I respectfully defer to the Department regarding budgetary decisions. NORAD and USNORTHCOM are responsible for establishing operational requirements and support the Golden Dome Direct Reporting Program Manager, the Services, and the Department as they assess resource allocation for Golden Dome.

Lieutenant General COLLINS. The Director of GDA is responsible for establishing requirements that will inform future cost estimates and architecture options.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

42. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, when do you expect to have an independent cost estimate for Golden Dome?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. Historically, obtaining an independent cost estimate (ICE) for a Major Defense Acquisition Program (MDAP) typically takes between 6 to 12 months, though the timeline can vary depending on the program's complexity and maturity. NORAD and USNORTHCOM will continue to work with the Department to support a timely ICE.

Lieutenant General COLLINS. The Director of GDA is responsible for establishing requirements that will inform future cost estimates.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

Defense Program Oversight

43. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, do you agree that generally any new major defense program should receive an independent cost estimate before Congress funds the program?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. Yes. Independent cost estimates are essential for ensuring new major defense programs are financially viable and accountable. They provide a robust foundation to make informed funding decisions, promote transparency, prevent waste, and help ensure taxpayer money is spent wisely on defense priorities. Without them, there is a heightened risk of moving forward with programs with unrealistic cost expectations, leading to future financial challenges.

Lieutenant General COLLINS. Major defense programs should receive an independent cost estimate before Congress funds the program, contingent on the severity and timeline of the threat the program is addressing.

Lieutenant General RASCH. I believe that communication with congressional stakeholders is a critical piece to the success of defense programs. In the case of the Guam Defense System, as new major defense program, joint cost estimates were created in coordination with OSD CAPE. In addition, OSD CAPE completed an independent assessment of the GDS total cost and integrated master schedule.

44. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, do you agree that a Congressional Budget Office cost estimate of a major defense program would help inform decisionmakers at DOD and in Congress on whether a program is worth pursuing?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. Yes, a Congressional Budget Office cost estimate of a major defense program is helpful for decisionmakers at both the DOD and in Congress. NORAD and USNORTHCOM will support the Department in its effort to appropriately inform decisionmakers both internally and in Congress as they determine which programs are worth pursuing.

Lieutenant General COLLINS. Yes.

Lieutenant General RASCH. The Department of Defense often utilizes independent entities in the development of programs and to support milestone decisions.

45. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, how does independent technical expertise in areas such as nuclear and space science benefit your office?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. Independent technical expertise in nuclear and space science is indispensable for enhancing homeland defense. It provides objective analysis, advanced technology development, and risk mitigation strategies to help ensure the U.S. remains prepared for emerging threats in both the nuclear and space domains. From missile defense and space security to nuclear deterrence and threat assessments, this expertise supports the development of comprehensive, resilient, and effective defense strategies to protect the U.S. Homeland.

Lieutenant General COLLINS. The independent technical expertise provides another perspective to our organic agency nuclear and space science expertise. The independent team is able to leverage their knowledge of supporting programs outside of MDA offices and provide our team insight into how other entities address similar issues.

Lieutenant General RASCH. The GDS JPO utilizes independent experts at Johns Hopkins University Applied Physics Lab and MITRE to support modeling and simulation and systems engineering for both exo-atmospheric and endo-atmospheric missile engagements.

46. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, Acting Assistant Secretary Yaffe stated in the hearing

that the President still has to make some decisions on the missile defense architecture and that the architecture will be released along with the DOD budget. Will a report on the final missile defense architecture be released by DOD or any other government agency? If so, please describe what level of classification the report will be released at and whether there will be an unclassified summary.

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. I respectfully defer to the Department on the release of DOD-level reporting. NORAD and USNORTHCOM execute the missile defense missions but are not directly involved in authoring or releasing potential reports on future architecture, but both commands are ready to provide support, expertise, and advice as additional guidance becomes available.

Lieutenant General COLLINS. If a report is directed by Congress, DoW will be responsible for releasing the final product. The classification of the product will be as required.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

47. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, will you commit to voluntarily complying with information requests and deadlines set by the DOD Inspector General or your service-specific Inspector General on Golden Dome?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. Yes, I will comply with any Inspector General requests received regarding Golden Dome.

Lieutenant General COLLINS. Yes.

Lieutenant General RASCH. Yes.

48. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, will you commit to voluntarily complying with information requests and deadlines set by the Government Accountability Office on Golden Dome?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. Yes, I will comply with Government Accountability Office requests received regarding Golden Dome.

Lieutenant General COLLINS. Yes.

Lieutenant General RASCH. Yes.

49. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, will you commit to voluntarily complying with information and testimony requests by Congress on Golden Dome?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. Yes, I will comply with requests for information and testimony by Congress regarding Golden Dome.

Lieutenant General COLLINS. Yes.

Lieutenant General RASCH. Yes.

50. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, has an Inspector General or the Government Accountability Office reached out to your offices about Golden Dome? If so, please describe the nature of that outreach.

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. No, NORAD and USNORTHCOM has not been contacted by an Inspector General or the Government Accountability Office regarding Golden Dome.

Lieutenant General COLLINS. No.

Lieutenant General RASCH. The GDS JPO has not received requests or communications from the Inspector General or Government Accountability Office on Golden Dome. The Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

GOLDEN DOME CONFLICTS OF INTEREST

51. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, which private sector entities has DOD consulted regarding the Golden Dome program? Please provide a complete list of all outside entities consulted.

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. I respectfully defer to the Department regarding private-sector consulting it may have conducted.

Lieutenant General COLLINS. The GDA Office is responsible for all information concerning the Department of War's activities on Golden Dome.

Lieutenant General RASCH. The GDS JPO has not consulted industry or outside entity engagements regarding Golden Dome as the JPO is not directly involved in the development of GDA.

52. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, what role, if any, has SpaceX, Anduril, Palantir, Lockheed Martin, L3Harris, or any of the company's officers or representatives had in developing or advising on requirements for Golden Dome?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. NORAD and USNORTHCOM (N&NC) establish operational requirements based on our assigned missions. While industry can present capability options to address those requirements, the commands are in support of the Golden Dome Direct Reporting Program Manager, the Services, and Missile Defense Agency as the organizations tasked with determining the best capabilities to meet requirements. NORAD and USNORTHCOM do not have any visibility on the role, if any, defense contractors have in developing or advising on Golden Dome requirements.

Lieutenant General COLLINS. The Director of GDA is responsible for establishing requirements that will inform future cost estimates and architecture options.

Lieutenant General RASCH. The GDS JPO has not participated in engagements or conversations with SpaceX, Anduril, Palantir, Lockheed Martin, or L3 Harris regarding Golden Dome as the JPO is not directly involved in the development of GDA.

53. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, what information have your offices received from SpaceX, Anduril, Palantir, Lockheed Martin, L3Harris, or any of the company's officers or representatives regarding Golden Dome?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. NORAD and USNORTHCOM have received briefings from Anduril, Raytheon, and Northrop Grumman, while other companies are scheduled to present on either the Golden Dome for America (GDA) writ large or various components in support of the GDA.

Lieutenant General COLLINS. The listed companies responded to MDA's GDA RFI last spring. DOW and MDA routinely receive unsolicited proposals from companies with ideas for new capabilities.

Lieutenant General RASCH. The GDS JPO is not a direct part of Golden Dome and has not discussed GDA's development with industry partners.

54. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, has there been any formal or informal involvement in the process of developing requirements for Golden Dome or awarding Golden Dome contracts by Elon Musk, or by individuals working for or on behalf of SpaceX, Anduril, Palantir, Lockheed Martin, or L3Harris, or any Government Department of Efficiency affiliated employees?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. While N&NC have no acquisition authority for the GDA, we have and will continue to work with the GDA Direct Reporting Program Manager, the Services, and Missile Defense Agency to determine the best capabilities to meet requirements.

Lieutenant General COLLINS. The Director of GDA is responsible for establishing requirements that will inform future cost estimates and architecture options.

Lieutenant General RASCH. The GDS JPO has not participated in engagements or conversations whether formal or informal with SpaceX, Anduril, Palantir, Lock-

heed Martin, or L3 Harris regarding Golden Dome as the JPO is not directly involved in the development of GDA.

55. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, has your office or any DOD office you are aware of been consulted by or in discussion with Elon Musk or any of his representatives regarding the Golden Dome program?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. NORAD and USNORTHCOM have not discussed Golden Dome development with Mr. Musk or his representatives.

Lieutenant General COLLINS. No.

Lieutenant General RASCH. The GDS JPO has not participated in engagements with Mr. Musk or anyone acting on his behalf.

56. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, according to press reports, DOD is considering a "subscription model" to acquire SpaceX services. What cost analysis has DOD performed related to its consideration of this model?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. I respectfully defer to the Department regarding acquisitions and related cost analysis. NORAD and USNORTHCOM are not involved in specific acquisition approaches.

Lieutenant General COLLINS. The Director of GDA is responsible for establishing requirements that will inform future cost estimates.

Lieutenant General RASCH. The GDS JPO does not currently have plans to acquire SpaceX services.

57. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, to the extent that DOD has performed the cost analyses mentioned in the question above, what have they shown?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. I respectfully defer to the Department, as NORAD and USNORTHCOM are not involved in this decision.

Lieutenant General COLLINS. The Director of GDA is responsible for establishing requirements that will inform future cost estimates.

Lieutenant General RASCH. The GDS JPO does not currently have plans to acquire SpaceX services and as such no cost analysis for that procurement have been conducted.

58. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, according to press reports a subscription model could cause DOD to be "locked into a subscription and lose control over its ongoing development and pricing." What are the long-term cost risks of a subscription model?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. I respectfully defer to the Department, as NORAD and USNORTHCOM are not involved in this decision.

Lieutenant General COLLINS. The Director of GDA is responsible for establishing requirements that will inform future cost estimates and architecture options.

Lieutenant General RASCH. Neither the GDS JPO nor the Rapid Capabilities and Critical Technologies Office (RCCTO) utilize subscription models for our programs.

59. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, what is DOD's intellectual property rights strategy for Golden Dome?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. I respectfully defer to the Department, as NORAD and USNORTHCOM do not have a role in determining intellectual property rights strategies related to Golden Dome.

Lieutenant General COLLINS. The DOD Instruction 5010.44 requires DoW programs to have an intellectual property (IP) strategy. For GDA efforts, the Director of GDA is required to manage a robust IP strategy to identify and manage the full spectrum of IP and related matters (e.g., technical data and computer software deliverables, patented technologies, and license rights) from the inception of a pro-

gram and updated throughout entire product life cycle—initially as part of the acquisition strategy, and during the operations and support phase as part of the life-cycle sustainment plan.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

60. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, will the DOD provide an assessment of the cost and readiness risks associated with a "subscription-based" model for Golden Dome?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. I respectfully defer to the Department as NORAD and USNORTHCOM are not involved in determining costs or risks associated with this reported model.

Lieutenant General COLLINS. The Director of GDA is responsible for establishing requirements that will inform future cost estimates and architecture options.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

61. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, what is the cost estimate for the "subscription-based" model for Golden Dome?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. I respectfully defer to the Department as I have not been made aware of the DOD cost estimate for a "subscription-based" model.

Lieutenant General COLLINS. The Director of GDA is responsible for establishing requirements that will inform future cost estimates and architecture options.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

62. Senator WARREN. Ms. Yaffe, General Guillot, Lieutenant General Collins, and Lieutenant General Rasch, which companies are most likely to benefit from an accelerated timeline for Golden Dome?

Ms. Yaffe did not respond in time for printing. When received, answer will be retained in Committee files.

General GUILLOT. I respectfully defer to the Department, as I do not have specific information about contracts related to Golden Dome.

Lieutenant General COLLINS. The Director of GDA is responsible for establishing requirements that will inform future cost estimates and architecture options.

Lieutenant General RASCH. This question is best answered by the Golden Dome program office. While there are potential synergies between the two, as it stands, the Guam Defense System and Golden Dome for America (GDA) are separate efforts and the JPO is not directly involved in the development of GDA.

QUESTIONS SUBMITTED BY SENATOR MARK KELLY

SM–3 IB

63. Senator KELLY. Lieutenant General Collins, fiscal year 2024 funding and supplemental dollars for SM–3 IB were available nearly 12 months ago. When did MDA re-engage the prime contractor for missile production?

Lieutenant General COLLINS. On December 29, 2022, the Missile Defense Agency (MDA) released a Request for Proposal (RFP) for a combined SM–3 Block (Blk) IB/SM–3 Blk IIA fiscal year (FY) 2023–2025 procurement contract. On July 11, 2023, the prime contractor submitted their initial proposal to MDA, but it was not fully compliant. Following termination of new production in the fiscal year 2025 President's Budget request, initial expenditure of Blk IA/IB missiles in combat, and the receipt of supplemental funding to replace those missiles, MDA provided the prime contractor with an updated All-Up Round (AUR) Blk IB procurement RFP on Au-

gust 16, 2024. In that RFP, MDA requested pricing for a minimum quantity of 10 AURs and a maximum quantity of 78 AURs. Since that time, we have remained engaged with the prime contractor to identify and mitigate production gaps and to accelerate the proposal and award timeline.

64. Senator KELLY. Lieutenant General Collins, extended delays in contracting have implications for the industrial base of any program. MDA recently stated that the SM–3 IB suppliers are in production. Are all SM–3 IB suppliers currently in production?

Lieutenant General COLLINS. No. The fiscal year 2019–2023 Multiyear Procurement (MYP) contract for SM–3 Blk IB remains in progress, with final deliveries planned for August 2026. Several suppliers have already delivered their components in support of the MYP contract. Many of these suppliers also deliver the same or similar components to other Department of War programs and maintain a current production line.

65. Senator KELLY. Lieutenant General Collins, did any SM–3 IB suppliers fall out of qualification during the period of program termination?

Lieutenant General COLLINS. The MDA is aware that production has been completed for several suppliers on the prior contract, and they will require restart and possibly requalification. We have worked with the prime contractor to award two Undefinitized Contract Actions (UCA). These UCAs will allow the SM–3 Blk IB supplier base to begin material procurement and assembly in advance of the fully definitized contract, using fiscal year 2024 and fiscal year 2025 funds. We anticipate awarding that contract by the end of this calendar year. MDA will complete a risk-based evaluation of the requalification process, balancing cost, delivery timeline, and technical risk, to determine if they can apply extensions or waivers on a case-by-case basis.

66. Senator KELLY. Lieutenant General Collins, if so, what are the costs and schedule delays caused to the program by these delays and qualification lapses?

Lieutenant General COLLINS. The costs associated with production gaps have been estimated by the prime contractor to be as high as $180 million. The cost estimates included assumptions about requalification requirements that may be reduced following case-by-case evaluation of requalification requirements. Requalification of production lines is not currently driving the production schedule. The primary schedule driver for production is an obsolescence effort with a resulting 33-month gap in deliveries between the current multiyear procurement contract and the follow-on fiscal year 2024/2025 contract. MDA and the prime contractor are working to reduce the timeline for the obsolescence effort and bring delivery schedule to the left.

67. Senator KELLY. Lieutenant General Collins, what is the production restart cost associated with the continuation of the SM–3 IB program?

Lieutenant General COLLINS. The MDA does not expect any explicit production restart costs other than those associated with supplier requalification and/or obsolescence efforts, as discussed above.

68. Senator KELLY. Lieutenant General Collins, what are the Non-Recurring Engineering (NRE) costs associated with the termination?

Lieutenant General COLLINS. The prime contractor's Not-To-Exceed estimate for the NRE associated with AUR procurement is $180 million. The government anticipates the final NRE costs will be lower but is dependent upon the final proposal and subject to negotiation of final cost.

69. Senator KELLY. Lieutenant General Collins, what percentage of the NRE could have been mitigated with a 2025 Undefinitized Contract Action (UCA) award?

Lieutenant General COLLINS. The MDA has awarded two UCAs in support of SM–3 Blk IB production. The first was for MK 72 Boosters, MK 104 Dual Thrust Rocket Motors, and Integrated Detector Assemblies and was awarded in February 2025. The second UCA was for up to 55 AURs awarded in May 2025. Definitization of these UCAs is planned by the end of this calendar year. MDA will not be able to estimate the percentage of NRE that will be mitigated by the use of these UCAs until after the contract is definitized. The use of UCAs did give the prime contractor the ability to begin production activities approximately 9 months earlier than would otherwise have been possible.

70. Senator KELLY. Lieutenant General Collins, what is the MDA plan to utilize UCA awards for the SM–3IB program in the future?

Lieutenant General COLLINS. The MDA awarded two Undefinitized Contract Actions (UCA) to support fiscal year 2024/2025 SM–3 Blk IB procurement. MDA awarded the first UCA in February 2025, for MK 72 Boosters, MK 104 Dual Thrust Rocket Motors, and Integrated Detector Assemblies. MDA awarded the second UCA in May 2025, for up to 55 All-Up Rounds (AUR). MDA plans to definitize these UCAs by the end of this calendar year. These UCAs will mitigate production gap risk and enable AUR delivery earlier. In the future, MDA will continue to evaluate the risks and benefits of using UCAs to accelerate outcomes and reduce Non-recurring Engineering (NRE) costs for SM–3 procurement.

71. Senator KELLY. Lieutenant General Collins, the Committee is aware that the decision to terminate led the prime contractor to turn off significant advance company funding for the program that would have bridged fiscal year 2023 to fiscal year 2024. How many missiles does the NRE value equate to at planned unit costs for fiscal year 2024/2025?

Lieutenant General COLLINS. The prime contractor has estimated the NRE cost at $180 million. Pending the final negotiated and definitized AUR per unit cost, this NRE cost equates to approximately 10 AURs.

72. Senator KELLY. Lieutenant General Collins, what is the MDA's plan to accelerate production and lower costs using Long Lead procurement, instead of relying on industry funding, in order to recoup schedule loss?

Lieutenant General COLLINS. The SM–3 program cannot utilize Advance Procurement (Long Lead-time Items) as defined in Department of War Financial Management Regulations (FMR) because no component, part, or material lead times exceed the life of the appropriation (FMR Vol 2A Chapter 1 section 2.2.3.3). SM–3 will utilize Economic Order Quantity in conjunction with future Multi-year Procurements (FMR Vol 2A Chapter 1 section 2.2.3.4). MDA awarded two UCAs to replace industry funding, which will allow the prime contractor and its suppliers to begin material procurement and assembly. These UCAs should allow MDA to recoup approximately 9 months compared to traditional contracting processes. An obsolescence issue, not covered under the UCAs, drives the first delivery of AURs. MDA awarded a separate contract action for that effort in June 2025. MDA and the prime contractor will work with the supplier to accelerate that effort and bring first delivery forward.

73. Senator KELLY. Lieutenant General Collins, MDA's termination decision also interrupted planned improvements to add capability and address obsolescence. How are those costs being addressed in the fiscal year 2024/2025 contract?

Lieutenant General COLLINS. The fiscal year 2024/2025 contract will not address added capability. As a result of the Department's decision to terminate, MDA is making several life-of-type buys for obsolete components to support the maximum quantity of AURs (78) specified in the Request for Proposal. These obsolescence mitigation efforts have been ongoing in parallel with the prime contractor's production contract proposal efforts. A separate contract covers obsolescence mitigation, and the AUR unit cost does not reflect it.

74. Senator KELLY. Lieutenant General Collins, the committee notes that the Director indicated that the SM–3 IB program will continue in production "for years into the future" during his testimony before the committee. How many SM–3 IB missiles does MDA intend to request in fiscal year 2026?

Lieutenant General COLLINS. The response contains sensitive information and will be provided to the requestor by other means.

75. Senator KELLY. Lieutenant General Collins, how many missiles annually will MDA request across the future years defense program (FYDP)?

Lieutenant General COLLINS. The fiscal year 2026 President's Budget request does not include additional procurement of SM–3 Blk IB missiles but does include procurement of 12 SM–3 Blk IIA missiles. The fiscal year 2026 President's Budget request only includes fiscal year 2026 procurement, not FYDP.

76. Senator KELLY. Lieutenant General Collins, the Director noted that there was no plan with the termination of SM–3 IB to fill the mission set and suggested the plan was to fill that mission set with SM–3 IIA. What are the distinct missions that both missiles do that are not common?

Lieutenant General COLLINS. The response contains sensitive information and will be provided to the requestor by other means.

77. Senator KELLY. Lieutenant General Collins, what mission sets does MDA give up with the termination of SM–3 IB and a planned reliance on SM–3 IIA?

Lieutenant General COLLINS. The response contains sensitive information and will be provided to the requestor by other means.

78. Senator KELLY. Lieutenant General Collins, the Director noted that there was no plan with the termination of SM–3 IB to fill the mission set and suggested the plan was to fill that mission set with SM–3 IIA. Are there distinct missions that both missiles do that are not common?

Lieutenant General COLLINS. The response contains sensitive information and will be provided to the requestor by other means.

79. Senator KELLY. Lieutenant General Collins, what mission sets what MDA giving up with the termination of SM–3 IB and a planned reliance on SM–3 IIA?

Lieutenant General COLLINS. The response contains sensitive information and will be provided to the requestor by other means.

80. Senator KELLY. Lieutenant General Collins, MDA did not request additional SM–3 IIAs in fiscal year 2025. What is the outlook for SM–3 IIA across the FYDP?

Lieutenant General COLLINS. The response contains sensitive information and will be provided to the requestor by other means.

81. Senator KELLY. Lieutenant General Collins, what is MDA's plan for annual production?

Lieutenant General COLLINS. The fiscal year 2026 President's Budget request does not include additional SM–3 Blk IB procurement but does include procurement of 12 SM–3 Blk IIA missiles.

82. Senator KELLY. Lieutenant General Collins, has MDA revisited inventory requirements for SM–3 IB and SM–3 IIA? Please provide the latest inventory requirements and current inventories.

Lieutenant General COLLINS. The MDA monitors the Navy Munitions Requirements Process (NMRP) for the SM–3 Blk IA/IB and SM–3 Blk IIA. The NMRP serves as the only formal capacity requirement for SM–3 missiles and accounts for new procurement, sustainment (recertification/repair/increased service life), operational expenditures, flight test expenditures, demilitarization, and unplanned losses. The NMRP is classified and updated annually and establishes the program's acquisition objective. The classified SM–3 Block IA/IB and IIA total munitions requirement numbers have been sent via other means.

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2026 AND THE FUTURE YEARS DEFENSE PROGRAM

TUESDAY, MAY 20, 2025

UNITED STATES SENATE,
SUBCOMMITTEE ON STRATEGIC FORCES,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

DEPARTMENT OF ENERGY'S ATOMIC ENERGY DEFENSE ACTIVITIES AND DEPARTMENT OF DEFENSE NUCLEAR WEAPONS PROGRAMS

The Committee met, pursuant to notice, at 4:46 p.m. in room SR–222, Russell Senate Office Building, Senator Deb Fischer (Chairwoman of the Committee) presiding.

Committee Members Present: Senators Fischer, Rounds, King, and Kelly.

OPENING STATEMENT OF SENATOR DEB FISCHER

Senator FISCHER. Welcome. The hearing will come to order. Welcome to our distinguished witnesses. Thank you for appearing before us today, and we look forward to hearing your testimony. This Subcommittee frequently hears about the threats that we will face in the coming years. We know that Russia and China are modernizing and diversifying their nuclear forces. We know that these nations have a No Limits partnership and are working together more closely than we ever anticipated, and we know that our modernization efforts have slipped.

There are many reasons for these delays, but this afternoon I want to hear from our witnesses about what the Department of Energy (DOE) and Department of Defense (DOD) are doing to move forward with nuclear modernization. Today we welcome two panels of witnesses. On our first panel, we have Mr. James J. McConnell, and Mr. Roger Jarrell. Did I say that correctly? Jarrell, from the National Nuclear Security Administration (NNSA) and Admiral William Houston from the Naval Nuclear Propulsion Program.

On our second panel, we have Mr. David Hoagland from NNSA, General Thomas Bussiere from Air Force Global Strike Command, and Vice Admiral Johnny Wolfe from the Navy Strategic Systems Programs. We also have Dr. Brandy Vann, who is performing the duties of the Assistant Secretary of Defense for Nuclear, Chemical, and Biological Defense Policy and Programs.

The Subcommittee was instrumental in creating that position in section 1621 of last year's, National Defense Authorization Act (NDAA). We did so because we observed a lack of cleared leadership within the office of the Secretary of Defense for the nuclear enterprise. I understand the implementation plan for Section 1621 has yet to be submitted to Congress. This delay does not instill confidence that the department is taking these reforms with the seriousness they deserve.

Before I turn it over to Senator King, I do want to congratulate NNSA on completing the first production unit of the new B61–13 nuclear bomb, which provides the President with additional options to go after harder targets. I look forward to hearing more about how NNSA was able to achieve this so quickly, and what opportunities exist to take lessons learned from manufacturing the B61–13 and apply them to other production lines.

Senator King, you are recognized for any remarks.

STATEMENT OF SENATOR ANGUS S. KING JR.

Senator KING. Thank you, Madam Chair. I think it's important to emphasize at the beginning of this hearing why nuclear weapons. Why is it that we have this focus on your production of nuclear weapons and also on our strategic delivery platforms? It's because of deterrence. The whole idea of nuclear weapons is to never have to use them, and they will never have to be used as long as our adversaries are convinced that if they use nuclear weapons first, they will pay a terrible and unacceptable price.

So I think it's important that we remember the fundamental purpose of this whole enterprise, which is to make this country safer and to avoid the use of these unthinkable weapons. Every year, or probably every 12 months or so, I speak at the launch of a new destroyer at Bath Iron Works in Maine, and my remarks always have a similar theme, which is we're building these ships in the hopes that they will never have to be used in conflict, because having them there, having the capability that you're responsible for developing is what keeps this country safe and avoids the unthinkable, which is a nuclear confrontation.

I am concerned, and I'm sure we will examine these questions in during the course of the hearing with issues of staffing whether it's at Hanford or at the National Labs or in NNSA generally because we can't solve these problems, we can't meet the demands that are being placed upon you without the people.

I'm worried that we've lost in the past few months some pretty important people, some very capable people, and I want to be sure that the expertise that those people carried with them is being transferred to new staff coming on, and that we're adequately staffing various departments and bureaus in order to be sure that we can meet the demands. We're now well into the modernization of the nuclear triad with missiles with the bomber, with the new Columbia class submarine, but they have to have the weapons in order to make them the effective deterrent, and that's where NNSA comes in.

So I'm looking forward to the hearing, and I hope you will address issues of staffing and adequacy of staffing because I am concerned that that could hobble our ability to meet the very high

level of demand that we have in the Nuclear Modernization Project. Thank you. Thank you, Madam Chair.

Senator FISCHER. Thank you, Senator King. Now I look forward to hearing the opening statements from our first members of the panel. Mr. McConnell, you are recognized.

STATEMENT OF JAMES J. MCCONNELL, ACTING PRINCIPAL DEPUTY ADMINISTRATOR

Mr. MCCONNELL. Chairman Fischer, Ranking Member King, and Members of the Subcommittee, thank you for the opportunity to provide an update on the Department of Energy's National Nuclear Security Administration. With the support of the administration in Congress, the NNSA is executing its vital National Security missions, which cannot be accomplished anywhere else in the U.S. Government.

Not since the cold war have we had seven simultaneous weapon programs in the program of record, and not since the Manhattan Project have we so fundamentally overhauled our infrastructure. Within these monumental tasks, I'm proud to report on some of NNSA's accomplishments. NNSA is simultaneously delivering major stockpile modernization programs that cover all three legs of the nuclear triad, introducing new capabilities for the President to strengthen deterrence.

Noticeably, the first war reserve plutonium pit for the W87–1 warhead was produced at Los Alamos National Laboratory in October. Last December, the B61–12 Life extension program, which improved the B61's safety, security, and reliability completed its last production unit. Additionally, NNSA achieved the first production unit for the B61–13 just yesterday, almost a year ahead of schedule.

Alongside stockpile modernization efforts, NNSA must design new materials for future stockpile needs, certify components, and assess the stockpiles condition annually. Our world class science and technology capabilities ensure that our stockpile is safe, secure, reliable, and effective without underground nuclear explosive testing.

Lawrence Livermore National Laboratory recently installed El Capitan, our first exascale computer system for national security. It has been benchmarked as the world's fastest supercomputer and is running full 3D nuclear weapons simulations in support of stockpile stewardship activities.

Infrastructure modernization across the enterprise is required to meet today's needs and provide enduring, flexible, and resilient capabilities. To this end, the enterprise blueprint aligns timely delivery of specialized infrastructure with mission demands over the next 25 years. We are making progress on large and small-scale projects. The uranium processing facility is now over 70 percent complete with operations plan to begin in 2032.

Reestablishing the capability to produce new plutonium pits remains a priority, and we continue to make progress at the Los Alamos Plutonium Pit Production Project and the Savannah River Plutonium Processing Facility. The Defense Nuclear Nonproliferation Program is another key element of our national deterrent and

helps to keep nuclear and radiological threats as far from the U.S. Homeland as possible.

As the share of nuclear power in the global energy mix grows, NNSA facilitates the global deployment of U.S. developed nuclear reactors that incorporate the highest standards of nuclear safeguards, security, and proliferation resistance. This work would not be possible without the dedicated professionals of the Federal and contractor workforce.

We are grateful for Congress's continued support. Thank you, and I look forward to your questions.

Senator FISCHER. Thank you, Mr. McConnell. Mr. Jarrell, welcome.

STATEMENT OF ROGER A. JARRELL II, PRINCIPAL DEPUTY ASSISTANT SECRETARY FOR ENVIRONMENTAL MANAGEMENT

Mr. JARRELL. Chairwoman Fischer, Ranking Member King, and Members of the Subcommittee, it's an honor to appear before you today.

The Environmental Management (EM) program was born out of the Manhattan Project, a monumental effort that helped end World War II and win the cold war. Today, EM is entrusted with the largest environmental cleanup effort in the world. Enabled by significant investments from Congress, EM is leveraging the best of American industry to achieve our mission safely and effectively. The budget request reflects the Trump administration's strong commitment to the EM mission and what it brings to the American people.

With treatment capabilities in place, addressing radioactive tank waste safely, effectively, and efficiently is a top priority for EM. Key demolitions are advancing, including at West Valley, where the last major building is set to come down next month. In Nevada, we're on track to complete legacy cleanup over the next 5 years. In addressing legacy waste of the past, EM is helping launch a golden era of American energy driving innovation and enabling national security missions of the future.

This is vividly on display in Tennessee. Transformational progress there is unleashing commercial nuclear power and supporting modernization of NNSA's Y12 complex, and the Oak Ridge National Lab. Management responsibilities for the Savannah River site have been successfully transferred to NNSA. In Idaho, our team is helping with key demolitions for naval reactors, and this spring we completed key infrastructure upgrades at WIP, so the facility can support Department of Energy (DOE) missions for years to come.

As we execute our mission, we're looking forward to ways to deliver cleanup commitments more efficiently without sacrificing safety or effectiveness. Just last month, we completed the 2000-gallon test bed initiative. It's a tool that's helping us look at options with the potential to address Hanford tank waste sooner, safer, and at less cost to the American taxpayers.

I thank the Subcommittee for this longstanding support of our program. I look forward to working with you and to answer your questions. Thank you.

Senator FISCHER. Thank you, sir. Adam Houston, welcome. It's good to see you again.

Admiral HOUSTON. It's great seeing you too, Chair Fischer.

STATEMENT OF ADMIRAL WILLIAM J. HOUSTON, USN, DIRECTOR, NAVAL NUCLEAR PROPULSION PROGRAM

Admiral HOUSTON. Chair Fischer, Ranking Member King, distinguished Members of the Subcommittee, thank you for the opportunity to testify today.

Your support for the Naval Nuclear Propulsion Program enables my team to design, operate, and maintain the world's preeminent force of submarines and aircraft carriers that routinely carry out high priority national security missions around the world. Through decades of investment in research and development, Naval Reactors has delivered the advanced technology that assures the U.S. Navy's current dominance. Our talented and dedicated people, peerless technology, and state-of-art facilities, give us the ability to operate our nuclear fleet wherever and whenever we choose.

To continue as the greatest naval force on the planet, we must continue to invest if we want to sustain our advantage. This year, Naval Reactors will prioritize three key areas and two priority projects. First, our most important resource, our people. The people within the Naval Nuclear Propulsion Enterprise are essential to the management and oversight of the important work we perform for our Nation.

Second, we'll continue to focus on research and development of technologies that support our current and future fleets to reduce overall costs, shorten construction timelines, and add capability to the fleet. Finally, we'll continue to execute efforts that modernize and sustain critical infrastructure throughout our aging Direct Lithium Extraction (DLE) laboratories.

I'm seeking your continued support for two national priority projects. The first is the continued development of the reactor plant for the *Columbia*-class ballistic missile submarine, directly supporting the Navy's number one acquisition priority. The second project is continued construction of the Navy Spent Fuel Handling Facility in Idaho, which enables long-term reliable processing of spent fuel from the Navy's nuclear fleet.

We continue to experience challenges with this project, but I've been to the site multiple times in the last year, and progress is visible. In closing, your strong enduring support enables the Naval reactors to succeed and continue to excel over 76 years beyond the early days of Admiral Rickover. I respectfully urge your continued support across our efforts this year. Thank you.

[The prepared statement of Admiral William Houston follows:]

PREPARED STATEMENT BY STATEMENT OF ADMIRAL WILLIAM HOUSTON

Chair Fischer, Ranking Member King, and distinguished Members of the Subcommittee, thank you for the opportunity to appear before you today to discuss Naval Reactors. Your continued, strong support for the mission of the Naval Nuclear Propulsion Program enables the United States' nuclear Navy to maintain and expand the maritime dominance our Nation has secured for many decades.

Naval Reactors continues to embody the foundational principles and standards of excellence set forth by Admiral Rickover over 76 years ago. Within my role, I routinely interact with our experts across the naval nuclear enterprise, directly super-

vise our dedicated laboratories and related work at our nuclear capable shipyards, and ensure safe and effective execution of the Program's cradle-to-grave responsibilities. As part of my annual appearance before the subcommittee, I want to assure you that the Naval Nuclear Propulsion Program is well positioned for the challenges ahead. On any given day, our Naval Reactors team is providing continuous support for a globally deployed force while maintaining an eye on future requirements and ensuring our position as the world's premier fighting force.

Naval Reactors' congressional support and the trust of the American people has been steady throughout our 76+ years of service. That support has positioned us well, but we will not rest on our existing reputation or processes, as the world continues to change around us. Naval Reactors must outpace that change in all aspects of naval nuclear propulsion and the Program is committed to maximizing the resources provided by the American people to make that happen.

As part of the Naval Nuclear Propulsion Program's responsibilities, we train every nuclear operator that serves onboard our nuclear-powered ships. I have interviewed hundreds of officer candidates in my first year as the Director and I am routinely impressed with the young, talented and energetic candidates who sit across from me. When I talk with commanding officers returning from deployment, there is a consistent message that the propulsion plants are performing very well and are highly reliable. It is the combination of willing, capable experts and the finest technology in the world that sets the framework for the future of naval nuclear propulsion.

I have established three pillars for the Naval Nuclear Propulsion program to focus on in the year ahead: our mission, our people, and our foundation. Our mission centers on ensuring the nuclear powered Navy is increasingly ready to fight today. That fight could include not only traditional weapons and combat systems, but also a hybrid mix of new, ambiguous threats. Our nuclear Navy must be ready to respond.

"People, not organizations, get things done," at Naval Reactors, and throughout the naval nuclear enterprise, we live this mantra on a daily basis. Our flat organizational construct enables and encourages seamless connections with our Fleet Sailors, public and private shipyards, the Navy and Department of Energy civilian workforce, and our Naval Nuclear Laboratory subject matter experts. As I will outline later in this testimony, our cadre of highly trained, educated and experienced professionals is keeping the US Navy ahead of competitors. Together, our people build and maintain the nuclear Navy, operate our dedicated research laboratories, train operators, utilize our nuclear infrastructure to support the Fleet, and ensure safe disposition of our spent naval nuclear fuel. Your partnership and leadership, together with the Department of Energy and the Navy is needed now, more than ever, as we design, manufacture and deliver warfighting ships that will power our fleet and protect the national security of the United States for the rest of this century and beyond.

Finally, Naval Reactors must solidify and reinforce our existing foundation, including the logistical frameworks we rely on to design, build, maintain and dispose of the nuclear powered fleet. While our continued success relies heavily on that foundation, we must keep an eye on the horizon. Through advanced development of cutting-edge technology, new materials and innovative designs, we continue to shepherd the naval nuclear industrial base while maintaining our high standards and delivering new capabilities.

Looking forward, we are increasingly aware of our adversaries' ambitions and the nature of new threats to our national defense both above and below the sea. Our actions today in executing cradle-to-grave responsibility for naval nuclear propulsion will impact the security and prosperity of our Nation for generations and our supremacy cannot be taken for granted. Naval Reactors will ensure our mission, people and foundation can efficiently meet the challenges the Nation has entrusted us with.

NAVAL REACTORS OVERVIEW

This Committee's support has enabled Naval Reactors to continue to power maritime dominance and preserve our record of safely operating and maintaining our ships, while protecting personnel, the public and the environment. We accomplish this through sharply focused regulatory oversight of all aspects of the Program, documented in annual performance reports available via the Department of Energy webpage. Your support has been essential to the design, development, production, and proving out of manufacturability of the *Columbia*-class propulsion plant, ongoing construction of the Naval Spent Fuel Handling Facility in Idaho, and recent resumption of training at our prototype research and training reactor at the Kesselring Site in New York. In the last year, we have made substantial progress with

construction and assembly of *Columbia*-class life-of-ship cores which are in serial production, with the second and third ship cores currently being built.

We will continue to meet current and near-term commitments, but we are constantly investing and planning for the future of naval nuclear propulsion. For example, Naval Reactors remains engaged with DOE and NNSA leadership to ensure a future uranium enrichment capability will support national security requirements, including naval nuclear propulsion, into the next century. Through the support of Congress, we continue to develop and pursue advanced technologies and recapitalize infrastructure across all four of our Naval Nuclear Laboratory sites. The Naval Reactors Facility in Idaho includes the Expended Core Facility (ECF), which provides the capability to manage and examine spent naval nuclear fuel, and materials irradiated in the Advanced Test Reactor. The ECF is over 60 years old, and Naval Reactors is transitioning its capabilities in stages, starting with spent fuel management, which will take place within the Naval Spent Fuel Handling Facility by the early 2030's. Naval Reactors is also beginning crucial design and scoping work on the second infrastructure project that will transition spent naval nuclear fuel examinations out of the ECF. As a continuation of our phased approach, a future irradiation testing capability will be vital to the Naval Reactors program into the next century.

MAJOR PROJECTS

Columbia-class Propulsion Plant

The *Columbia*-class ballistic missile submarine remains the Navy's number one acquisition priority. Research, development, and design for the *Columbia*-class SSBN began in fiscal year 2010 and construction started in fiscal year 2021. The Navy-funded electric drive propulsion system for the *Columbia*-class is revolutionary. To date, lead ship reactor plant components have been delivered on schedule and the reactor core remains on track to support lead ship delivery. Naval Reactors will continue reactor plant design, fabrication, and safety analysis work required for lead ship reactor testing. Additionally, Naval Reactors recently commenced testing of the lead ship electric drive propulsion system at the compatibility test facility (CTF) in Philadelphia, PA.

Spent Fuel Handling Recapitalization Project

Construction of the Naval Spent Fuel Handling Facility at the Naval Reactors Facility in Idaho is progressing. The Naval Spent Fuel Handling Facility is essential to management and disposition of naval spent nuclear fuel in support of aircraft carrier and submarine fleet operations. Near-term milestones include erection of structural steel for the main process building, construction of the reinforced concrete spent fuel pools, and procurement and installation of the process and utility systems required for operations. I want to encourage Members and staff to visit the site to view this project's scale and progress to date. As the visible progress and constant activity at the site get us closer to the finish, Naval Reactors remains committed to keeping the committee informed of progress on this complex and large-scale infrastructure project.

Naval Examination Acquisition Project (NEAP)

The Naval Examination Acquisition Project (NEAP) is the second major project at the Naval Reactors Facility in Idaho. NEAP will recapitalize and transition the existing reactor core examinations capability out of the aging ECF. These core examinations allow scientists and engineers to compare actual fleet operation-measured reactor core performance data, to performance predicted by models and testing programs during development and production of the core. These examinations provide vital data to validate, improve, and deliver, safe and unrestricted operations throughout the multi-decade lifespans US Navy reactor cores are designed to operate. Without examining actual spent fuel, current fleet operations may be restricted or limited when issues arise, with conservatism maintained to protect the crew, the core and the environment. The Program will move forward on the several-year detailed design phase to prepare for NEAP construction to support these examinations. We are incorporating lessons learned from the Spent Fuel Handling Recapitalization Project and are engaged with NNSA and DOE on timing and sequence of planned infrastructure projects at the Idaho National Laboratory. I look forward to providing an update in the coming years as we come through the complex design phase for this essential facility.

TECHNICAL BASE

In addition to the three priority projects discussed above, Naval Reactors maintains a world-class, high-performing workforce across the naval nuclear propulsion

technical base. Our workforce provides sustained, uninterrupted support of the cradle-to-grave operations of our Nuclear Navy, and on-call assistance for hundreds of operational requests on an annual basis. The Program's technical base includes a foundation of specialists at our dedicated facilities and laboratories that provide a human-in-the loop, utilizing cutting edge equipment related to nuclear materials, nuclear physics, thermal-hydraulics testing, acoustics, electronics, software development, and systems integration, to conduct our work.

The Naval Reactors technical base not only supports the fleet operating today, it sets the foundations for our Navy to retain and expand our technological advantages over competitors. Specifically, the technical base: 1) receives daily emergent requests and feedback from our globally deployed nuclear fleet, 2) executes cutting-edge technology research and development in support of improving today's nuclear fleet and delivering a more capable and lethal future fleet, and 3) modernizes critical dedicated infrastructure and equipment while safely and efficiently addressing the Program's legacy environmental liabilities.

Recruiting, promoting and retaining top talent in our government civilian and contract workforce is critical to our ability to fulfill and mature our mission amidst a wide array of challenges and new demands. The broad range of talent in our organization is in high demand from all areas of our economy, but many choose to stay with the Program because we are directly supporting national defense. We remain focused on attracting and retaining a well-trained, highly qualified workforce and continue to work with our laboratories, private shipyards, Navy, and DOE leadership to stay competitive in this aggressive talent market within the nuclear enterprise.

Program Direction

The Naval Nuclear Propulsion Program will utilize Federal employees to supervise, set direction for, and effectively manage operations at our Headquarters in Washington D.C. and field offices in New York, Pennsylvania, and Idaho.

Supporting several classes of nuclear-powered ships whose lifetimes can extend over half a century requires staffing continuity and longevity, and that workforce possesses the deep technical knowledge to execute Naval Reactors' cradle-to-grave responsibilities. The combination of increasingly complex systems, new and innovative research, and evolving and expanding vulnerabilities are informing our human capital strategy to develop and mature generational expertise. Recruiting, training, and retaining the Naval Reactors workforce is a fundamental enabler of all aspects of naval nuclear propulsion, and assures the power to propel our submarines and aircraft carriers and their systems.

In concert with our ongoing focus on research and development, we continue to identify new approaches to attract the Nation's top talent and retain the skilled workforce to meet the critical requirements of naval nuclear propulsion.

Research and Development of Naval Reactors (NRD)

Naval Reactors Development (NRD) is focused on safely and effectively delivering competitive advantage in all that we do. Technology investment today will increase capability, reduce costs, shorten lead times, and tighten construction spans for current and future nuclear powered warships.

Our first priority is today's fleet of nuclear powered submarines and aircraft carriers. Our laboratories and resident experts directly respond to hundreds of operational requests and technical evaluations annually. They assess and respond to emergent issues, keep our ships mission-ready, safe to operate, and deployable anywhere, any time. The unique nature of military operations has a significant portion of our nuclear powered ships at sea and globally deployed all day, every day. Their propulsion and power systems are required to remain online at all times. That does not happen without critical support, years of technical expertise, and a ready technical laboratory infrastructure.

Naval Reactors has reinvigorated advanced technology development for the next generation of nuclear powered ships and submarines. We are pursuing advanced reactor core and fuel systems, manufacturing methods and inspection techniques, next-generation propulsion plant equipment, instrumentation and control systems and sensors, and asymmetrical applications of technologies. These advancements take time to materialize and be proven, but in response to today's strategic environment, we are executing with a higher sense of urgency to simultaneously shorten development timelines, lower acquisition and lifecycle costs, and improve adaptability. I invite you to visit our facilities with your staffs, talk with our naval nuclear propulsion experts and enhance your understanding of how we are delivering this capability.

Operations, Facilities and Infrastructure

Our operations, facilities and infrastructure support a wide spectrum of Naval Reactors' cradle-to-grave related work and recapitalization projects at multiple Naval Nuclear Laboratory facilities and infrastructure systems. Many of the Program's required facilities have supported the Program since its inception under Admiral Rickover, over 76 years ago.

Decontaminating and decommissioning (D&D) facilities that date back to the early 1950's, including some no longer in use, is also part of our facilities and infrastructure plan. We have approximately $6B in environmental liabilities requiring D&D efforts. A significant portion of this estimate includes the cost to remediate and demolish the inactive facilities and infrastructure at the Naval Nuclear Laboratory sites, which were essential to earlier propulsion plants on now-retired classes of submarine and surface ships.

We continue to retire these liabilities in an environmentally responsible and cost-effective manner. Our established partnership with the Department of Energy Office of Environmental Management (DOE-EM) leverages their experience in efficient, safe, and cost-effective remediation of environmental liabilities. DOE-EM is working on all four of our sites, including D&D of the S1W prototype that supported development of the USS Nautilus (SSN 571), which will complete dismantlement later this year.

CONCLUSION

Over 76 years of maritime dominance does not guarantee we will continue to lead, and every day, there are active challenges to our maritime position. Naval nuclear propulsion remains an incredible but unforgiving technology, we harness it with a constant focus on safe operation across the cradle-to-grave responsibilities the Nation entrusts to Naval Reactors. We are balancing investment in today's fleet with future fleet requirements, while delivering unflinching naval nuclear propulsion for the U.S. Navy. I appreciate the strong support of Congress for this program.

Senator FISCHER. Thank you, Admiral. The committee will now start our first round of questioning, 5-minute round, please.

Mr. McConnell, as I mentioned in my opening statement, I commend NNSA's workforce for their dedication and speed in delivering the first production unit of the B61–13. In this setting, are there any lessons learned from the production of the B61–13 that can be applied to other production lines?

Mr. MCCONNELL. Thank you, Senator. Most definitely there are. The clear collaboration and alignment between the Department of Defense and the Department of Energy and NNSA from the beginning in the initiation of the B61–13 concept allowed us to move promptly into a design and approval process, which allowed for maximum use of the production capabilities that had been established for the B61–12 and allow us to very efficiently and effectively transition from the last production unit of the B61–12 into the first production unit of the B61–13, using very similar production and equipment components.

So that ability to maximize efficiency and minimize the transition time and to add another capability to the President and the war fighters to address, as you had said in your opening remarks, harder and larger targets with the B61–13 allowed us to fill a need in our deterrence and address that very quickly.

Senator FISCHER. Do you see any other opportunities where we can increase and accelerate the weapons production?

Mr. MCCONNELL. So NNSA has for quite a while had a program to enhance stockpile responsiveness, which is a across the board effort to identify opportunities to improve the efficiency of everything from design, through design for manufacturing, through production, production certification, and rate production through this effort that's been underway for, as I said years now.

At the same time, we're looking to do more accelerated capabilities and create an office that would allow us to be even more focused on identifying new and novel ways to bring options to the President and the war fighters to address ongoing and new needs.

Senator FISCHER. Last October, you released your enterprise blueprint and that outlined the plans for recapitalizing major infrastructure projects over the next 25 years, and that includes how it will replace facilities that date back to the Manhattan Project. I appreciate the level of thought that went into those plans, including the careful sequencing to ensure that new facilities come online as they're needed so it can support the production of our nuclear weapons.

Can you provide us with an update about the ongoing capital assets projects?

Mr. MCCONNELL. Thank you, Senator, and thank you for your continued attention and awareness to our enterprise blueprint and the opportunity that it represents.

Senator FISCHER. I find it very exciting, the opportunity it presents. I hope it's followed.

Mr. MCCONNELL. Very much so. We have laid out a very—as you indicated, a very thoughtful and careful and not extreme list of key facilities that are necessary over the next 25 years to produce a agile and responsive and resilient nuclear security enterprise that is fit for the challenges that we will face. It is time-phased to make sure that we bring the facilities on in order that they're needed to produce the actual products that we deliver to the Department of Defense. So there is a logic and a sequencing to it.

Nonetheless, it is a fairly large group of things to be done. Thankfully the President's budget is strongly supportive of nuclear modernization, and we are off to a very good start to execute the facilities that are in the first earliest phase of that time sequenced enterprise blueprint.

Senator FISCHER. In your opening comments, sir, you in passing—I felt it was in passing, you mentioned Savannah River. Can you provide us with an update on Savannah River and the plutonium processing facility there?

Mr. MCCONNELL. Yes, so a couple different things. My colleague discussed that we have transitioned the site itself from an Office of Environmental Management focused site to NNSA as the landlord for the entire site in recognition of our long and continuing and growing need for operations at Savannah River, not the least of which is the Savannah River Plutonium Production Facility. That facility is well underway under design.

We look forward to achieving the 90 percent design threshold, a key threshold for us for having significant understanding of the expectations, requirements, and design details of the facility in calendar year 2026. There are other things going on in parallel. We need the facility. We also need the talented people to man the facility and for example, our welding certification facility is up and running, and so now we are putting students through in order to be able to have talented and capable skilled craft in the numbers we need with the certifications we need to execute the mission as soon as the facility itself is ready.

Senator FISCHER. Are you comfortable with the schedule you're on?

Mr. MCCONNELL. We need to do everything fast. Time is our most significant figure of merit. It is a very complicated, large, and difficult facility to construct. We are on a good timeframe. We are making progress to meet our expected milestones. But major, one-of-a-kind high hazard nuclear facilities like these are always difficult to manage and I would always like to have more margin.

Senator FISCHER. Thank you, sir. Senator King, you are recognized.

Senator KING. Thank you, Madam Chair. Mr. McConnell, I think one of the most underappreciated risks that this country faces is the danger of terrorists getting ahold of nuclear materials. My frustration is that I can't find where in the whole Federal enterprise, somebody's in charge of thinking about that. So I'm going to start with you. All of our attention is to our near peer adversaries, and I understand that, but if nuclear materials and rudimentary explosive device fell into the hands of a terrorist group, deterrence doesn't work.

They don't have a capital city to destroy. They don't care about dying, and the damage on a nuclear device in a tramp steamer headed into the port of New York would be incalculable. Talk to me about proliferation and how we keep our own materials safe, but how can we think about this in a broader sense, for example, developing technology to sense nuclear materials in a place where they shouldn't be.

Mr. MCCONNELL. Thank you for the question, Senator. Your question in your opening remarks, you talked about the deterrent with a T, the safe, secure, and reliable nuclear deterrent that we are responsible for. We are also responsible for many other aspects of deterrence with a C, including our Office of Defense Nuclear Nonproliferation, and the Office of Counter-Terrorism Counterproliferation.

Senator KING. Is that within NNSA?

Mr. MCCONNELL. Those are within NNSA. They are a senate confirmed Presidential appointee at the same rank and the same position as our deputy administrator for defense programs. The Defense Nuclear Nonproliferation mission includes the efforts to figure out how to frustrate and prevent risks posed by non-State actors. You're absolutely right, sir. The non-State actors are not deterred in the same way as the State actors are. We have a integrated system between Defense Nuclear Nonproliferation, and the Counter-Terrorism Counterproliferation folks with the support of the scientists and engineers and capabilities of the defense programs part.

Senator KING. I would hope also the intelligence community.

Mr. MCCONNELL. The intelligence community and our Department of Energy Intelligence group to prevent, counter, and respond to those threats. Our approach is to make sure that it is extremely difficult, virtually impossible for those non-State actors to get access to the material and the technology that is necessary to create a device and to make the penalty they pay for attempting to acquire that material or that knowledge very high and to make sure that our ability to detect and to counter and prevent any efforts are

successful so that we can maintain safety and security and provide that deterrence as far from the U.S. shores as possible.

Senator KING. I agree and I appreciate that. I just hope this will maintain a high level of focus because, as I say, I think it's a somewhat underappreciated risk when we're talking about national security. I view this as one of the most serious that we face. Let me talk for a moment about staffing. As you know, there was a 16 percent cut initially, and people came back. Now, I think we're talking about an 8 percent cut in the staffing of NNSA. But my impression is you were understaffed to start with.

Has any cost benefit analysis been made about what the cost to the enterprise is of losing people versus the fairly limited savings from the salary involved?

Mr. MCCONNELL. I'm not aware that we've done an analysis in that parameter space. We have evaluated the risk to our mission of the recent reductions in staff and have found them acceptable for now and in the short term to continue to achieve our mission.

Senator KING. That strikes me as implausible, given the level of the demands being placed upon the agency at this particular moment in time where we're modernizing, we're developing new weapons, we're trying to get back into the pit business. Downsizing in that situation doesn't strike me as a logical management move.

Mr. MCCONNELL. We believe we are acceptably managing the risk of the status quo. Our mission is increasing over time and the speed by which our mission is increasing is also getting more rapid. It is important as we go forward with the enterprise blueprint, with the program of record, with all of the work in front of the National Nuclear Security Administration, that as our output requirements and mission requirements increase, that our ability to meet those mission requirements and outputs are commensurate.

We are never going to be able to buy our way to success and there's, there's limits to that. So a fundamental part of our ability to achieve——

Senator KING. I might suggest there's something between buying your way to success and staff cuts that diminish the ability of the enterprise to meet its goals.

Mr. MCCONNELL. I agree, Senator, and we are going to need to make sure that our resources are adequate. We're also going to continuously need to look for those productivity and efficiency enhancements that will fundamentally allow us to unlock additional output and achieve the mission that the Nation and the Department of Defense and the President expect of us.

Senator KING. Thank you. I'll have some followup questions.

Senator FISCHER. Thank you, Senator King. Senator Rounds, you are recognized.

Senator ROUNDS. Thank you, Madam Chair. First of all, gentlemen, thank you for your service to our country. Mr. McConnell, China and Russia are significantly expanding their nuclear arsenals. How is the NNSA adjusting its stockpile stewardship and modernization priorities to maintain a credible deterrence against both near peer competitors simultaneously? How does the growing parody between Chinese and U.S. nuclear arsenals impact the ability of the U.S. to maintain that nuclear deterrence?

Just to throw in just a third one here, just for the heck of it, as the combined nuclear arsenals of Russia and China begin to eclipse that of the United States in terms of numbers of warheads, will that increase the likelihood or decrease the interest of our partners or unaligned nations seeking their own nuclear deterrent?

So basically, how are we stacking up against our adversaries? What are we doing to stay ahead? What's that going to do to the stability in the rest of the world?

Mr. MCCONNELL. Thank you, Senator. As I indicated earlier, we are currently engaged in seven weapon modernization programs at the same time. This is the most active and the highest number of weapons systems we've been producing or working on developing at one time since the height of the cold war. That is reflective of the requirements that we get from the President, the strategic command, and the Nuclear Weapons Council. We are very successful up to this point in delivering. We have delivered the B61–12, the B61–13, we're on track with the W88, which is to achieve first production unit relatively soon.

We're continuing with the other weapon systems, W87, W80–4, all of those programs represent our increased focus on the ability to ensure that the President and the war fighters have the options they need to respond to the geopolitical realities we are in. That is not to say that we're at or trying to get to parody, certainly not parody with the combined capabilities of the Chinese and the Russians, that we can deter and provide the deterrence with a flexible, effective, efficient, and reliable suite of options in our deterrence, which is what we're working on.

That combined with our dedicated efforts to improve the physical condition of the security enterprise, both its production capabilities and its science capabilities that are essential to be able to design, certify, and assess the stockpile gives us and continues to give us the edge and the confidence that we need to provide deterrence, both for ourselves and in somewhat into your last point is also the extended deterrent that we provide to our allies and our other friendly nations.

We are rising to the challenge, but the challenge keeps rising also. We will continue on that path.

Senator ROUNDS. Out of curiosity, because we're talking about lots of demand for it, and along with fuel for our carriers and our submarines, where are we getting our uranium? Can we talk about that in this open setting?

Mr. MCCONNELL. Yes, to a certain extent. So we need uranium for many different uses. We need unencumbered uranium in order to run reactors to produce tritium. We need highly enriched uranium to fuel the Admiral's reactors for our nuclear fleet of submarines and aircraft.

Senator ROUNDS. No question about the need. My question is in this open setting, and I'm not sure if we can do it or not, but where are we getting it from?

Mr. MCCONNELL. So we have enough material on hand for the near term for both unencumbered fuel for production uses and for the Navy. But we are going to need eventually to create a domestic enrichment capability, and that the Department of Energy and the National Nuclear Security Administration are currently on a two-

pronged effort to do that. We have an activity going on with Babcock and Wilcox Nuclear Energy (BWXT) to produce the Domestic Uranium Enrichment Centrifuge Experiment, DOUCE, it's much easier as an acronym. Then we have the AC 100 also.

Senator ROUNDS. I didn't do a very good job of asking it maybe. Where are we getting our uranium from? Can we talk about that in here?

Mr. MCCONNELL. Perhaps——

Senator ROUNDS. Admiral Houston?

Mr. MCCONNELL. Phone a friend.

Admiral HOUSTON. Yes, Senator. We're getting it from existing stockpiles. We haven't produced highly enriched uranium since 1992. For my program, which is the primary user, because I actually expend that highly enriched uranium because I'm using it in my reactors. We are good into the 2050's for that. But we are watching, we will need an enrichment capability, just like the weapons complex will need an enrichment capability. That's part of the enterprise blueprint that's outlined by NNSA to develop that enrichment capability.

Senator ROUNDS. So the enrichment capabilities that we will need, we know it, we've got till 2050, but between now and then we should be talking about it.

Admiral HOUSTON. Absolutely, Senator, and that's going to be due to the difficulty and standing up that capability——

Senator ROUNDS. That's not a 5-year plan either, is it?

Admiral HOUSTON. It is not. It is a long-term plan across there, and it's laid out in the NNSA blueprint, sir.

Senator ROUNDS. Excellent. Thank you. Thank you, Madam Chair.

Senator FISCHER. Thank you, Senator Rounds. For our next rounds of round of questions, I would ask that we just ask one question since we have a second panel coming up. Mr. McConnell, you're getting a work over today. Can you provide us with an update on—no, I want to ask you this one.

How are you working to ensure that Los Alamos can meet the demand for pits until Savannah River can do that rate production?

Mr. MCCONNELL. Thank you, Senator. As I indicated, we've hit a major milestone in producing the first diamond stamped war reserve, W87–1hit at Los Alamos in October of last year. We are now actively working on the project, which will allow us to achieve rate production of at least 30 pits per year at Los Alamos. We call it 30 base.

That project is executing right now to deliver approximately 2028, and then we will followup with additional work to improve the reliability of our ability to deliver. So a more reliable production rate at 30 pits per year, which will take us into the early 2030's. What that work means specifically is we need to move old equipment out of the space to create D and D we call it. It's another thing that EM does quite a lot of, in order to create white space that we can then move new work spaces, new glove boxes and capabilities in.

Senator FISCHER. Are you speaking specifically about Los Alamos here?

Mr. MCCONNELL. Yes, all of that happens in PF4.

Senator FISCHER. And how that ties in then to what happens at Savannah River.

Mr. MCCONNELL. Right. So by 2028, we get to the 30 pit per year capability at Los Alamos. In parallel at Savannah River, at the Savannah River Plutonium Production Facility, SRPPF, as they indicated, we're working to mature the design to get to 90 percent design in calendar year 2026, which will then allow us to move on to construction and production of the plant by 2032 to get to initial production and then rate production of at least 50 pits per year at Savannah River in that timeframe.

Senator FISCHER. Thank you. Senator King.

Senator KING. Mr. Jarrell, I'm going to give you a question for the record so it doesn't count as my one question. If you could supply the Committee with an analysis of your staffing levels. I know you've lost some key people at Hanford. But for the record, not now, but if you could give me some background on that.

Senator KING. Admiral, my question is, is Naval Reactors on track with the Columbia Construction Project? In other words, when the submarines are ready, will the new reactors be ready?

Admiral HOUSTON. Senator King, absolutely. My reactor for District of Columbia is ready. It's just waiting to be shipped when Electric Boat wants it. We don't ship it early just due to security requirements.

Senator KING. Of course.

Admiral HOUSTON. The second reactor core is 75 percent complete. Now, we don't have issues with that. Our heavy plant equipment we are on schedule to meet required in yard dates so that steam generators, pressurizers, reactor cooling pumps. Our largest component, which I've mentioned before that had the most concern for us was the turbine generator. That turbine generator is at Electric Boat right now. It's being outfitted, completely tested. Our turbine generator has been tested and it's being packaged for shipment from the vendor across country, and it is not the critical path on delivery of District of Columbia. So we are within the timeframe on that.

Senator FISCHER. Senator Rounds.

Senator ROUNDS. I will pass.

Senator FISCHER. Okay. With that, I would like to thank our first panel for being here today and providing us with information. You may get other questions for the record, and I would ask that you return those within 2 weeks. Thank you. If we could have the second panel.

Welcome to our members of panel two. We appreciate you being here today. If you are ready, we will take your opening statements. Let's begin with Dr. Vann, please?

STATEMENT OF DR. BRANDI C. VANN, PERFORMING THE DUTIES OF THE ASSISTANT SECRETARY OF DEFENSE FOR NUCLEAR, CHEMICAL, AND BIOLOGICAL DEFENSE PROGRAMS

Dr. VANN Yes, ma'am. Chairwoman Fischer, Ranking Member King, and Members of the Subcommittee, thank you for the opportunity to testify here before you today regarding our nuclear forces.

As President Trump and Secretary of Defense, Hegseth have stated, the United States will achieve peace through strength by

rebuilding our military and reestablishing deterrence. Nuclear weapons provide a unique deterrence effect that no other element of our U.S. military power can replace, and our Nation must continue to field a flexible and modern nuclear deterrent. These capabilities are critical to the continued safety and security of our American people, our allies, and partners, both now and in the future.

The Department continues to prioritize nuclear modernization and sustainment of the three legs of the triad and our nuclear command control and communications, as well as all the supplemental capabilities to the program of record. Additionally, the department supports the efforts of Department of Energy's National Nuclear Security Administration to recapitalize, sustain, and operate the nuclear enterprise. The United States must deliver the nuclear modernization program of record while continuing to sustain our legacy systems to avoid a deterrence shortfall and mitigate risk.

To that end, the President's top line budget request for the Department of Defense does include a prioritization of our nuclear modernization and sustainment efforts. The Department of Defense remains staunchly committed to the viability of the United States nuclear deterrent in response to an unprecedented security environment with multiple nuclear challengers who have not followed our lead as a responsible nuclear power.

DOD is acutely aware of the significant challenges that we face and recognizes that urgent action is required. In response to this evolved threat landscape, the department and the Nuclear Weapons Council continue to make the necessary policy changes and implement necessary actions to address what we acknowledge is a program of record that is necessary but maybe insufficient for the realities of the security environment that we will face.

We recognize that we must be flexible, efficient, and adaptable to the evolving geopolitical landscape in order to defend the Homeland and provide options to the Secretary and the President that bolster deterrence. I want to close by acknowledging the creation of the Assistant Secretary of Defense for Nuclear Deterrence, Chemical, and Biological Defense Policy and Programs referred to in the department as the ASDNDCBD, who will be at the forefront of the DOD's efforts to sustain and modernize this nuclear deterrent. This position will serve as a key point of accountability to Secretary Hegseth and to Congress on this critical national security mission.

Finally, thank you to this Committee for your longstanding bipartisan support to our nuclear deterrent mission and to the dedicated professionals across our nuclear enterprise, as well as my colleagues here at the table who work diligently every day to execute this highest priority defense mission. Thank you, and I look forward to your questions.

Senator FISCHER. Thank you, Dr. Vann. Mr. Hoagland, welcome.

STATEMENT OF DAVID A. HOAGLAND, ACTING DEPUTY ADMINISTRATOR FOR DEFENSE PROGRAMS

Mr. HOAGLAND. Thank you, Chairman Fischer, Ranking Member King, and members of the committee, I'm grateful for the opportunity to represent the men and women of the NNSA today. It is

an honor to describe the extraordinary range of activities being executed across our nuclear enterprise.

NNSA performs national security functions that exist nowhere else in the U.S. Government. Among these responsibilities is to ensure the safety, security, and effectiveness of the stockpile, which has been the cornerstone of America's defense for more than 75 years. The foundation of our mission is our workforce, the cadre of scientists, engineers, technicians, Federal agents, and others at NNSA and across our enterprise who provide exceptional expertise to our nuclear deterrent.

Although this mission has spanned decades, we are now performing it in a strategic environment that grows more challenging with each passing year. The United States must simultaneously deter multiple nuclear armed adversaries whose own nuclear capabilities continue to advance. To ensure the dependability of our deterrence, NNSA is now modernizing both the legacy stockpile as well as the scientific and the production infrastructure upon which it depends.

NNSA is presently executing seven major stockpile modernization programs covering all three legs of the nuclear triad. One recent addition to this program of record, which has been discussed, the B 61–13 observed a key milestone this month when we completed the first production unit of the new bomb fully 1 year ahead of schedule. This acceleration was achieved by implementing several technical and programmatic innovations to optimize production in an approach we hope to apply to future modernization efforts.

NNSA has also established a program for the Nuclear Armed Sea launched cruise missile, which will provide the Navy with considerable new options to deter China in the Indo-Pacific. Work is on schedule for the W 80–4 warhead, the warhead for the Air Force's long-range standoff missile, and beyond these current programs, NNSA is also pursuing two formal studies to meet requirements for hard and deeply buried target defeat and next generation reentry capabilities.

Underlying both our stockpile modernization programs and the development of future capabilities is the infrastructure of the weapons complex. As the committee is acutely aware, both our production plans and the facilities used to design, certify, and assess the stockpile are urgently in need of recapitalization. Even as we maintain and operate legacy facilities, we're prioritizing infrastructure investments to align with mission needs over the next quarter century through the enterprise blueprint.

In particular, NNSA is advancing multiple large construction projects to provide the strategic materials needed for the deterrent, including plutonium, uranium, lithium, tritium, and high explosives. Successfully meeting NSA's objectives and in turn ensuring the dependability of the Nation's strategic deterrent, consistent investment. I appreciate Congress's unwavering support of the deterrence mission, and I look forward to your questions.

[The joint prepared statement of Mr. James McConnell and Mr. Dave Hoagland follows:]

JOINT PREPARED STATEMENT BY MR. JAMES MCCONNELL AND MR. DAVE HOAGLAND

Chairman Fischer, Ranking Member King, and Members of the Subcommittee, thank you for the opportunity to provide an update on the Department of Energy's (DOE) National Nuclear Security Administration (NNSA). NNSA appreciates the Subcommittee's ongoing support.

NNSA performs national defense and public safety and security missions that exist nowhere else in the U.S. Government. In addition to maintaining the U.S. nuclear stockpile and powering the Navy's nuclear fleet, NNSA is responsible for preventing the spread of nuclear weapons to foreign states and terrorists and responding to life-threatening nuclear emergencies. Over the last year, NNSA continued to deliver modernized nuclear weapons to the Department of Defense (DoD) while sustaining stockpile systems and minimizing or securing nuclear and radioactive materials around the globe to stop threats as far from the U.S. Homeland as possible. This work is being carried out every day by the dedicated and highly talented women and men across the nuclear security enterprise's Federal and contractor workforce.

NNSA is executing these missions against the backdrop of an increasingly complex and volatile international environment that presents significant, often overlapping, challenges. China represents a unique threat as it rapidly modernizes and expands its nuclear arsenal while continuing to be an economic peer. At the same time, Russia maintains the world's largest nuclear arsenal, continues to expand its capabilities, and has revised its nuclear use doctrine, expanding the set of circumstances under which it may launch a nuclear attack. The need to deter Russia and China simultaneously presents a new deterrence challenge distinct from the cold war and presents a possible future where the U.S. must counter two nuclear peers.

We are also witnessing growing threats from regional actors like Iran and North Korea. Iran continues to take steps to reduce the amount of time it would take to produce a nuclear weapon. North Korea is committed to developing long-range, nuclear-armed missiles capable of posing a direct threat to the United States, its allies, and critical assets across the Indo-Pacific region.

Finally, we are seeing growing levels of military and economic cooperation between Russia, China, Iran, and North Korea, including technology sharing. As the 2025 Annual Threat Assessment of the U.S. Intelligence Community noted, "These primarily bilateral relationships, largely in security and defense fields, have strengthened their individual and collective capabilities to threaten and harm the United States, as well as improved their resilience against U.S. and Western efforts to constrain or deter their activities."

In this challenging strategic environment, the U.S. nuclear stockpile remains safe, secure, reliable, and effective. However, we recognize that deterrence is not static; new and modern capabilities and options for the President are necessary to not only maintain but strengthen deterrence.

NNSA is also challenged by aged and fragile infrastructure across the nuclear security enterprise. It is becoming more challenging to reliably meet deterrence needs in decades-old production facilities and science and technology infrastructure. NNSA is working to maintain existing facilities to meet current stockpile demands while simultaneously investing in modern infrastructure.

Considering the compounding challenges facing the enterprise, I am proud to report on some of NNSA's recent accomplishments. In a major milestone, the first war reserve (WR) diamond-stamped plutonium pit for the W87–1 warhead was produced at Los Alamos National Laboratory (LANL) last October, reestablishing a previously dormant manufacturing capability essential for our enduring stockpile. Last year, NNSA completed the Last Production Unit (LPU) of the B61–12 Life Extension Program (LEP). The successful execution of this program saw the consolidation of multiple B61 variants with updated non-nuclear components and improved safety, reliability, and accuracy metrics that will extend its service life for at least another 20 years. By taking advantage of existing B61 production lines, NNSA now anticipates producing the first B61–13 almost a year ahead of schedule.

The unmatched scientific capabilities we use every day to design, certify, and assess our stockpile have made further groundbreaking advances, which are foundational to our confidence in the nuclear deterrent. Last year, Lawrence Livermore National Laboratory installed El Capitan, our first exascale computing system for national security. With the capability to perform 2.79 quintillion calculations per second at peak performance, it has been benchmarked as the world's fastest supercomputer and is currently running classified, full 3D nuclear weapon simulations in support of nuclear stockpile stewardship activities. Additionally, the National Ignition Facility (NIF) has now repeated its seminal 2022 fusion ignition breakthrough

numerous times and continues to see increased yields and net energy gains. On April 7, NIF achieved a record fusion energy yield of 8.6+MJ, demonstrating the first gain greater than 4 times. Fusion ignition provides unparalleled insights into the exceptionally high pressures and temperatures present inside a nuclear explosion. The ability to successfully replicate ignition at higher yields and greater net energy gains improves our ability to maintain confidence in the nuclear stockpile.

Over the past year, NNSA has also achieved significant accomplishments across the full range of its nonproliferation, counterterrorism, and emergency response activities, significantly contributing to U.S. security by eliminating or mitigating nuclear security threats before they affect the Homeland, our interests overseas, or our allies. NNSA has worked to improve the United States' space-based nuclear detection capability in partnership with U.S. Space Force through the delivery of Global Burst Detector III payloads. These sensors are integrated into satellites in support of the nuclear warfighting mission and treaty verification. Additionally, NNSA has replaced or is in the process of replacing almost 90 percent of the cesium-based blood irradiators in the United States with devices that do not use radioactive sources, permanently reducing the risk of a "dirty bomb" attack on American soil.

NNSA's Naval Reactors program continues to ensure the U.S. Navy's competitive warfighting edge and secure the sea-based leg of the nuclear triad with unmatched submarine technology. The reactor for the new Columbia-class ballistic missile submarines and reactor designs for the next generation of fast-attack submarines are in progress. The S8G Prototype reactor at the Kesselring Site completed its refueling overhaul last July, providing an additional 20 years of training, research, and development opportunities. The Spent Fuel Handling Recapitalization Project at the Naval Reactors Facility also continues to progress, and with the near-term award of the last major construction subcontract, the Project retires a significant amount of risk and will be entirely in execution mode through completion. The project has completed its heavily reinforced concrete foundations, continued erecting structural steel for the main process building, and started construction of the spent fuel pools.

Finally, to help plan the modernization and recapitalization of NNSA's aged and fragile infrastructure, NNSA published its Enterprise Blueprint which outlines a 25-year plan to align the construction of specialized infrastructure with demands across the nuclear stockpile, global security, and naval nuclear propulsion missions. The United States can no longer rely on decades-old production facilities and science and technology infrastructure to meet deterrence needs. The nuclear security enterprise must re-establish eliminated capabilities; replace buildings that are failing; and meet modern safety, security and environmental standards. While the Enterprise Blueprint provides a roadmap to modernize and recapitalize NNSA's specialized infrastructure, we recognize that as an enterprise we must reliably deliver projects on time and within cost parameters if we are to successfully deliver a modern infrastructure capable of delivering a modern stockpile for our Nation's defense.

These accomplishments demonstrate NNSA's determination to fulfill our national security missions while remaining clear-eyed about the scale of the work ahead. We intend to move forward with urgency and precision.

WEAPONS ACTIVITIES

NNSA's Weapons Activities portfolio covers activities including stockpile management; production modernization; stockpile research, technology, and engineering; infrastructure and operations; defense nuclear security; secure transportation; and information management and cybersecurity.

Stockpile Management

Stockpile Major Modernization

NNSA is executing an expanded program of record to meet extant and emerging DOD requirements. We are delivering seven major stockpile modernization programs which are at different stages of design, engineering, and production simultaneously. The modernization programs cover all three legs of the nuclear triad and introduce new options and capabilities for the President.

In December 2024, NNSA achieved the LPU for the B61–12 LEP just 3 years after the announcement of the First Production Unit (FPU) in fiscal year 2022. In fiscal year 2026, the program will transition to Stockpile Sustainment.

NNSA is also building the B61–13, which strengthens deterrence and assurance by providing the President with additional options against certain harder and large-area military targets. The program will be in Phase 6.6, (Full-Scale Production). Appropriated funds in fiscal year 2024 for the B61–13, allowed NNSA to leverage active B61–12 production capabilities. NNSA appreciates the support from Congress to authorize and appropriate these funds in fiscal year 2024. This has improved effi-

ciency and enabled NNSA to quickly meet an emerging DOD need. NNSA plans for a system level FPU in fiscal year 25, significantly ahead of our previous fiscal year 2026 timeline.

The W88 Alt 370 Program will remain in Phase 6.6 (Full-Scale Production) and is scheduled to reach LPU in the final quarter of fiscal year 2025. The W88 warhead has been deployed in the stockpile for more than 30 years. The W88 Alt 370 modernizes the arming, fuzing, and firing subsystem; improves surety; and replaces the conventional high explosive and associated materials.

The W80–4 LEP will remain in Phase 6.4, (Production Engineering), and reached a major milestone with reacceptance of the WR plutonium pit. The program has also reached FPU for multiple components. It remains on track for system FPU in fiscal year 2027, aligned with the Long-Range Standoff Weapon and the Air Force's schedule for initial operational capability.

In accordance with Section 1640 of the fiscal year 2024 National Defense Authorization Act (NDAA), NNSA and DOD added the Nuclear-Armed Sea-Launched Cruise Missile (SLCM-N) to the program of record. The program entered a tailored Phase process which combined Phase 6.2 (Feasibility Study and Option Down-Select) and 6.2a (Design Definition and Cost Study) in June 2024. In January 2025, NNSA's SLCM-N Federal program office down-selected the warhead to the W80 family and continues to coordinate with DOD as missile options are evaluated.

The W87–1 Modification Program is currently in Phase 6.3 (Development Engineering). The program is replacing the W78 warhead, currently one of the oldest in the stockpile. It will be the first weapon to receive newly manufactured plutonium pits. This program took a critical step forward last year when the first WR plutonium pit for the W87–1 was diamond stamped at LANL. NNSA continues to closely coordinate with the Air Force's Sentinel Program, and the FPU for the W87–1 is scheduled to be delivered in the early 2030's.

The W93 program will be in Phase 2a, (Design Definition and Cost Study), with efforts focused on ascertaining the cost and schedule associated with development and production of the W93/Mk7. The W93 will meet DOD requirements to enhance operational effectiveness of the U.S. ballistic missile submarine force. The W93 program is being undertaken in parallel with the UK A21/Mk7 or Astraea warhead program, continuing coordination through the U.S.-UK Mutual Defense Agreement.

Stockpile Sustainment and Weapon Dismantlement and Disposition (WDD)

Stockpile Sustainment supports maintenance, sustainment, and surveillance activities to ensure the existing U.S. nuclear deterrent remains safe, secure, and effective. Stockpile Sustainment directly executes maintenance, limited life component exchanges, minor alterations, surveillance, assessment, surety studies and capability improvements, management activities, and support of weapons until they are dismantled for all enduring weapons systems in the stockpile. WDD also provides material and components from dismantled weapons for reuse in the current and modern stockpile and provides for safe and secure dismantlement of nuclear weapons, components, and critical materials for the stockpile, production modernization, and other stakeholders across the nuclear security enterprise.

Production Operations (PO) and Nuclear Enterprise Assurance (NEA)

PO provides the unique foundation for site-specific, production-enabling capabilities to execute weapons production, including process improvements and investments focused on increased efficiency of production performance. Scope covers recruitment and development of skilled labor required for nuclear weapon systems capabilities that enable individual weapon production and are not specific to one material stream. PO also provides production equipment maintenance and calibration services for manufacturing operations to meet DOD WR requirements. In addition to these activities, NEA prevents, detects, and mitigates potential consequences of subversion across the enterprise, both to the stockpile and to the associated capabilities to design, produce, and test nuclear weapons.

Production Modernization

The production modernization program re-establishes and modernizes the manufacturing capabilities for nuclear weapons that degraded or were eliminated after the cold war. This includes modernization of unique materials production capabilities across the enterprise including plutonium, uranium, lithium, high explosives, tritium, non-nuclear components, weapons assembly/disassembly and special materials. All of these materials and capabilities require modern infrastructure to ensure reliable production capabilities at required capacities.

Plutonium Pit Production

NNSA's highest production modernization priority is re-establishing the ability to produce new plutonium pits at scale, a capability that has been absent since Rocky Flats ceased operations in 1989. Although the W87–1 and W93 programs are setting the pace and quantity for pit production now, NNSA's long-term stewardship of the nuclear stockpile, including future weapons systems, will require newly produced pits. We recognize, fundamentally, that as long as nuclear weapons exist, we will need a pit production capability. To achieve the requisite pits per year (ppy) necessary for current and future stockpile needs, NNSA is pursuing a two-site strategy at LANL and the Savannah River Site (SRS). The two-site strategy is a key component of NNSA's development of a modern nuclear security enterprise, with an emphasis on flexibility and resilience.

NNSA's pit production plan includes a redesign and refurbishment of plutonium facilities at LANL to support a production capacity of no fewer than 30 ppy while simultaneously increasing the production of WR qualified pits for the W87–1. This work achieved a major breakthrough when the first diamond stamped WR plutonium pit for the W87–1 was produced last year. We anticipate Los Alamos achieving the capability to produce 30 ppy by 2028, with increased manufacturing rate confidence as additional equipment is installed into the early 2030's. In the coming year, NNSA is planning to conduct engineering evaluations for Los Alamos pit production in concert with increased equipment purchases, installation activities, and removal of legacy equipment in pursuit of rate production. Our ability to execute work on the pit production line while producing qualified plutonium pits for the W87–1 is a testament to our adaptability as an organization and the urgency around reconstituting this vital capability.

NNSA is also making progress on the Savannah River Plutonium Processing Facility (SRPPF) to establish the capacity to produce at least 50 ppy. The SRPPF Main Process Building is on track to reach 90 percent design completion in calendar year 2026 and NNSA aims to establish a cost and schedule baseline for the project in fiscal year 2026. Demolition and removal of equipment and commodities from the interior of the Main Process Building at SRPPF was completed in 2024 with over 2,500 gross tons of material sent offsite for recycling. We have also completed design in areas such as road construction and other required site preparations to accelerate the start of construction.

As NNSA ramps up efforts to bring on the workforce necessary to operate SRPFF, SRS is also bringing new facilities online that will be essential for training specialized machinists and operators, such as the Machining Training Center, established last year. Once SRPPF construction is finished, NNSA will introduce nuclear material and begin the manufacturing process for pits and reach rate production as soon as possible. We recognize the aggressiveness of SRPPF's schedule and appreciate congressional support for construction and long-lead procurements.

NNSA expects to make progress on the final design of the overall SRPPF project and the beginning of construction of the High-Fidelity Training Center, Main Process Building and the Operations Center. These subprojects are being pursued in parallel with ongoing execution of long-lead procurement such as production equipment, gloveboxes, and bulk material.

Uranium

Alongside pit production, the Uranium Processing Facility (UPF) at the Y–12 National Security Complex is a top infrastructure modernization priority. Current uranium processing is carried out in Building 9212, a Manhattan Project-era facility well past its design life. By contrast, UPF will relocate casting, special oxide production, and salvage and accountability capabilities into a new, modern, more efficient, and safe facility. The construction of the overall UPF project is now over 70 percent complete. We expect construction to be finished in 2027 with transition to operations to complete no later than 2032. The current UPF cost estimate is $10.35B. While UPF is under construction, NNSA continues to maintain legacy facilities to produce weapons components.

Along with UPF, NNSA is advancing its development of one or more gas centrifuge technologies for domestic uranium enrichment. Our nearest-term priority is to produce unobligated low-enriched uranium (LEU) to fuel tritium production. Over the long-term, we will need to produce unobligated highly enriched uranium (HEU) for the Naval Nuclear Propulsion Program. For almost 10 years, NNSA's efforts have been focused on research and development at Oak Ridge National Laboratory to advance the Domestic Uranium Enrichment Centrifuge Experiment (DUECE) gas centrifuge technology. This past August, NNSA contracted with BWXT-Nuclear Fuel Services to conduct a year-long engineering study that will help us plan our acquisition approach for a pilot plant using the DEUCE technology. The next step will be

to contract for the design and licensing to deploy this pilot plant at the beginning of fiscal year 2026.

To reduce risk to meeting domestic uranium enrichment program objectives, NNSA is also exploring the feasibility of a second centrifuge technology, the AC100. This past December, NNSA released a Request for Information for industry input on an AC100 deployment that would provide a limited early production capability and demonstrate one of the available centrifuge technologies. NNSA is on track to contract for an AC100 project execution plan at the beginning of fiscal year 2026.

Lithium

Lithium handling, packaging, and processing are key capabilities in the nuclear weapon production mission. NNSA requires specialized, weapon-specific forms of lithium for the production of nuclear weapon components. NNSA currently processes lithium in Building 9204–02 at the Y–12 National Security Complex, which is 82 years old and suffers from structural degradation. In 2023, NNSA broke ground on the Lithium Processing Facility (LPF). NNSA will ensure the continuity of critical lithium processing capabilities during the transition to LPF.

Tritium

Tritium gas, a critical component of nuclear weapons systems, decays over time and must be continually replenished to maintain stockpile effectiveness. NNSA produces tritium by irradiating Tritium Producing Burnable Absorber Rods (TPBARs) at two Tennessee Valley Authority (TVA) reactors before transferring them to SRS for extraction, purification, and loading into gas transfer system reservoirs, or for other national security needs. During this past year, NNSA, in coordination with the TVA, pursued and received Nuclear Regulatory Commission (NRC) approval to increase the per-reactor operating cycle maximum TPBAR limit from 1,792 to 2,496. This represents a 39 percent increase in TPBARs and by extension, a similar increase to the Watts Bar Nuclear (WBN) reactor site tritium production capacity. The increase will enhance programmatic flexibility and capacity to meet demand fluctuations or recover from a potential realization of programmatic risks. NNSA continues to support an increasingly reliable, resilient, and flexible tritium supply chain to meet the growing nuclear security enterprise mission.

High Explosives and Energetics

NNSA is currently working on two major construction projects that support our high explosives capability. The High Explosives Science and Engineering (HESE) facility at the Pantex Plant will consolidate 15 aging facilities into three new, more efficient ones to conduct science, technology, engineering, and production activities. We anticipate HESE completion in 2028. Additionally, at Pantex, the High Explosives Synthesis, Formulation, and Production Facility (HESFP) will replace 11 deteriorating World War II-era formulation facilities and establish an in-house high explosives manufacturing capability. NNSA is working to achieve the operational start date for HESFP as required by the fiscal year 2024 NDAA. While NNSA executes these major capital projects within the complex, we are also working closely with partners in DOD to establish main charge insensitive high explosives production at Holston Army Ammunition Plant, and with the Naval Surface Warfare Center Indian Head Division for HE formulation. Additionally, to ensure a sufficient supply of critical FK–800 binder needed to manufacture these high explosives, NNSA successfully contracted with 3M to procure up to 32,000 pounds of remaining FK–800 supply, which is anticipated to be delivered by the end of fiscal year 2025. NNSA is also formulating new insensitive high explosives to replace existing formulas that use FK–800.

Non-Nuclear Components

The overwhelming majority of a nuclear weapons package consists of highly specialized non-nuclear components. NNSA designs most of the non-nuclear components at Sandia National Laboratories and produces them at the Kansas City National Security Campus. The need to execute seven weapon modernization programs simultaneously presents a production capacity challenge at Kansas City, as the current manufacturing complex was designed for a requirement of one weapons system in development and one system in production. Changes in the program of record have resulted in a significantly increased need for non-nuclear components, and therefore a doubling of the workforce since 2014. To meet expanded production, facility, and workforce needs, NNSA launched the Kansas City Non-Nuclear Expansion Transformation (KCNExT), a multi-phase real eState acquisition approach, allowing the utilization of each phase immediately upon completion while construction continues elsewhere. NNSA broke ground on Phase One last year and a Topping Out Ceremony for Phase One occurred in February.

In addition, all weapons require trusted, warhead strategic radiation hardened microelectronics (WSRH). These can only be designed and manufactured at the Sandia National Laboratories' Microsystem Engineering, Science, and Applications (MESA) complex. Strategic radiation hardened microelectronics are essential components of a nuclear weapon's arming, fuzing, and firing system, which provides the signals that initiate the nuclear explosive chain. Production of WSRH components at MESA is considered high risk due to high downtime rates of old equipment that is no longer supported by the manufacturer.

STOCKPILE RESEARCH, TECHNOLOGY, AND ENGINEERING (SRT&E)

The SRT&E program provides the foundation for science-based stockpile decisions; delivers advanced capabilities to support DOD requirements and counter emerging threats; and innovates across the nuclear security enterprise to improve productivity, efficiency, and responsiveness. For more than 30 years, NNSA's unrivaled scientific enterprise has provided the decisive edge to maintain confidence in the stockpile without the need for explosive testing. Thanks to the tireless work of a generation of scientists and engineers, we now have a better understanding of a nuclear weapon than at any time in the atomic era.

Within SRT&E, the Advanced Simulation and Computing program supports the subject matter experts, integrated design codes and other physics and engineering models, along with the enabling infrastructure represented by El Capitan and other computational systems. These capabilities provide unprecedented modeling and simulations essential for certifying the nuclear stockpile and also provide support for NNSA's nonproliferation and counterterrorism missions.

As Secretary Wright has said, AI is the next Manhattan Project. NNSA is taking decisive action to leverage advantages offered by AI. We believe this technology can be applied to every aspect of our nuclear deterrent mission, accelerating the time needed to solve some of the Nation's toughest science challenges. That is why NNSA is already starting to harness our premier computing power to support AI to analyze diagnostic data, optimize experimental designs, and improve our facility operations. NNSA will not only use AI to support the critical Stockpile Stewardship Program (SSP) with data those who created the program did not know was possible, but will also use it to provide valuable insights into the potential for AI to advance similar non-NNSA defense missions and assess our adversaries' military activities.

The Inertial Confinement Fusion program gives NNSA experimental access to extreme temperature and pressure regimes characteristic of nuclear weapons explosions to support design, certification, and assessment of the nuclear stockpile. While commercial fusion energy facilities are being designed and built, LLNL's NIF remains the only location on Earth capable of achieving fusion ignition. NIF's ability to repeatably provide multi-megajoule fusion yields allows stockpile scientists to test the survivability of U.S. stockpile systems when exposed to hostile environments, improve the predictive capability of NNSA's simulations, develop high-fidelity diagnostics and advanced experimental platforms, and better understand the outputs of nuclear explosions. As modernization decisions will be reliant on the certification of new materials, components and systems not previously fielded in the stockpile, the capability to generate fusion yield in the laboratory is a critical tool that is unique to the U.S. nuclear complex.

The Weapon Technology and Manufacturing Maturation program develops agile, affordable, assured, and responsive technologies and capabilities for nuclear stockpile sustainment and modernization. This action accelerates the nuclear weapons lifecycle by rapidly developing, building and testing prototypes through ground and flight test demonstrations. The Engineering and Integrated Assessments program ensures system-informed survivability in present and future stockpile-to-target sequences and ensures a responsive nuclear deterrent through collaborative partnerships, proactive integration, disruptive innovation, and assessments. NNSA is supporting two Phase 1 system studies for early exploration of concept assessments for hard and deeply buried target defeat and non-ballistic reentry systems in response to Nuclear Weapons Council requests for joint studies of future weapon and nuclear security enterprise capabilities. NNSA will continue to support our DOD partners and harness the creative and dynamic capabilities of our labs, plants, and sites to rapidly address the shifting threat environment.

A critical infrastructure investment to support the design, certification, and assessment of the current and future stockpile, NNSA is constructing the Enhanced Capabilities for Subcritical Experiments (ECSE). The current focus is on the expansion and construction efforts at the Principal Underground Laboratory for Subcritical Experimentation (PULSE) at the Nevada National Security Site. ECSE includes development of the Z-Pinch Experimental Underground System (ZEUS) and Ad-

vanced Sources Detectors (ASD) Scorpius instruments. Experiments with these tools at PULSE will allow NNSA to conduct system-level plutonium aging experiments by the end of the decade, providing an important capability to assess system designs. Importantly, they will support certification of the W80–4, W87–1, and W93 programs.

INFRASTRUCTURE AND OPERATIONS

As NNSA's workload increases in response to the global threat environment, the enterprise urgently requires modernized infrastructure. A significant portion of NNSA's critical facilities is operating beyond its 40-year life span while other capabilities must be reestablished. Recapitalizing and restoring these capabilities is critical for on-time delivery of the weapons modernization program of record.

While new facilities are under construction, NNSA must continue to maintain and operate in legacy facilities to enable weapons modernization at an increased pace as well as meet global nuclear security requirements, including counterterrorism, counterproliferation, and nuclear emergency response. As noted previously, the need to operate legacy facilities while also constructing new ones places additional financial and workforce strain on NNSA and requires our adaptability and flexibility.

The Enterprise Blueprint issued last year is the plan for surmounting this challenge. It provides a roadmap for the next quarter-century of NNSA programmatic construction to carefully manage the overlapping requirements of weapons delivery schedules, legacy facility maintenance, and new facility construction by employing new approaches to improve performance in delivering projects. Even so, we are clear-eyed that reform must come from within, and NNSA must keep costs and schedules within appropriate levels as part of our responsibility to Congress and the American people.

Infrastructure modernization goes beyond the construction of new facilities. It also delivers modern capabilities and efficient technologies that take advantage of revolutions in production over previous decades while promoting higher safety and security standards for our workforce and the communities in which we operate. The overall aim of our infrastructure modernization effort is to make the nuclear security enterprise scalable and flexible to meet non-linear mission demand over the coming decades.

SECURE TRANSPORTATION

NNSA's Secure Transportation program includes the Mobile Guardian Transporter (MGT) acquisition program, leading-edge communication systems and recruitment, retention, and training for our highly qualified Federal Agents. MGT is the next generation secure trailer system and with our highly qualified Federal agents, will ensure the safety and security of existing and planned cargoes, meet nuclear explosive safety standards, and protect the public. Due to the rigorous screening and training required for these Federal agents, maintaining a steady cadence of Federal Agent Training Courses is essential, and NNSA appreciates support for continuing to onboard new agents.

The Secure Transportation Asset (STA) Program, which provides this capability, has a record of 100 percent safe and secure shipments without compromise, loss of components, or release of radiological material.

DEFENSE NUCLEAR SECURITY

Defense Nuclear Security provides protection for NNSA personnel, facilities, weapons, and materials from a full spectrum of threats ranging from minor security incidents to acts of terrorism in a rapidly evolving technology threat landscape.

As NNSA's overall mission set continues to grow, NNSA is enhancing security capabilities through the acquisition and employment of innovative physical security technology to improve risk mitigation and promote more efficient security operations. Additional personnel, larger facility footprints, and larger quantities of sensitive materials require additional shifts and potential return to 24/7 operations at some locations. Furthermore, rapidly evolving technology presents novel security challenges that require novel solutions.

One of the most complex and rapidly evolving security threats NNSA faces is from drones and other uncrewed aircraft systems. NNSA is making substantial investments in next-generation counter-uncrewed aircraft systems (CUAS) while updating hardware and software of current platforms. In partnership with Idaho National Laboratory, NNSA is using the lab's dedicated CUAS range to conduct testing and evaluation of future-generation CUAS acquisitions, assisting security planners in identifying future generation solutions to improve NNSA's existing CUAS platforms.

Information Technology and Cybersecurity

NNSA faces a growing array of IT and cybersecurity challenges and is responding through strategic modernization of its IT and cybersecurity environments to include more resilient and flexible capabilities. These investments focus on enterprise-scale cybersecurity infrastructure, operational technology security, Nuclear Enterprise Assurance requirements, zero trust architectures, and commercial cloud-based technologies for both classified and unclassified networks. Additional investments include integrated communications and innovative collaboration services. These actions are geared toward making NNSA systems more secure in an increasingly digital world.

NNSA continues to invest in its digital transformation and digital engineering efforts. In July 2024, NNSA launched Enterprise Secure Network (ESN) Hub, a centralized classified computing environment that will connect partners and collaborators across the enterprise in new ways, increasing productivity while keeping our work secure. For the first time, NNSA mission personnel can access a common enterprise-wide computing infrastructure from secure locations across the enterprise at any time. This effort is just one part of NNSA's broader digital transformation initiative that will streamline and optimize efficiency across the enterprise through new tools and revised work processes.

DEFENSE NUCLEAR NONPROLIFERATION

The work conducted under Defense Nuclear Nonproliferation creates a multilayered defense to prevent, counter, and respond to the threat of nuclear and radiological terrorism, as well as the threat of hostile countries acquiring nuclear weapons. This work makes America safer by both protecting American citizens and interests overseas and keeping threats as far from the U.S. Homeland as possible. These activities are a powerful and necessary component of strategic deterrence.

NNSA's nonproliferation programs also facilitate the global deployment of U.S.-developed nuclear reactors that incorporate the highest standards of nuclear safeguards, security, and proliferation resistance. NNSA's work in this area is a "win-win" that helps unleash the American nuclear renaissance while also keeping America safe from the threats of nuclear proliferation and terrorism.

Material Management and Minimization

The Office of Material Management and Minimization works to prevent hostile State or non-State actors from acquiring weapons-usable material for use in an improvised radiological or nuclear device by eliminating it or replacing it with less attractive material.

NNSA is successfully executing a recovery project for high-assay low-enriched uranium (HALEU). This activity removes unusable scrap HALEU materials from Y–12's aging 9212 facility and processes it into an oxide form. Once produced, the material is being provided to DOE's Office of Nuclear Energy to support advanced reactor demonstrations. In addition to the benefits to industry, this project will support a more efficient transition to UPF. To date, NNSA has produced over 300 kg of oxide and is on track to produce more over the next 2 years.

NNSA also works with partners in the United States and with countries around the world to convert research reactors and medical isotope productionsites away from HEU to LEU or HALEU. These conversions allow for critical research and business activities to continue while eliminating the associated proliferation risk. Most recently, NNSA's partnership with Japan achieved the conversion of the first of two reactor cores at Kyoto University's Critical Assembly from HEU to HALEU. This marks the 110th research reactor or medical isotope facility that NNSA has helped convert to a proliferation resistant fuel or otherwise verified as shutdown.

Additionally, NNSA works with partner countries around the world to eliminate excess inventories of HEU and plutonium. To date, NNSA has eliminated over 7,345 kg of HEU and plutonium, the material equivalent of several hundred nuclear weapons.

Global Material Security

The Office of Global Material Security makes America safer by working in the United States and internationally to secure and prevent the smuggling of radioactive and nuclear materials that could be used in an attack against the United States or its interests.

Global Material Security also works with U.S. industry to advance U.S. competitiveness, prosperity, and security. The program currently works with nine U.S. advanced reactor vendors on security by design to increase global competitiveness and exportability. It also supports the development of groundbreaking technologies to replace radioactive materials, such as cesium–137 and cobalt–60 across a broad spec-

trum of medical, agricultural, and industrial applications. This includes a congressional mandate to eliminate all cesium–137 blood irradiators in the United States by 2027. To date, NNSA has eliminated 400 such devices. Eliminating these materials ensures that they can never be used in a radiological device that poses a threat to the United States, its citizens, or interests. Global Material Security also deploys American radiation detection equipment in countries around the world to build partner-country capacity to stop radiological and nuclear smuggling. This forward-leaning approach disrupts illicit smuggling supply chains and halts threats before they can reach the Homeland.

Nonproliferation and Arms Control

Dating back to the Eisenhower Administration, it has been U.S. policy to support the safe and peaceful use of nuclear energy. Today, that growth is larger than at any point in history. In 2023, there were more than 410 nuclear reactors in operation across 30 countries. Today, more than 40 countries are considering expanding their civilian nuclear fleets or adopting nuclear power. Many of these countries are nuclear newcomers who lack the sophisticated technical experience and safeguards regime to ensure the safe use and operation of these power plants and their material. China and Russia also dominate the field of nuclear reactor construction. Of the 52 reactors that have started construction since 2017, 48 are of either Chinese or Russian design.

To balance longstanding U.S. support for expanded nuclear power use and the potential known and unknown proliferation risks associated with that expansion, the Nonproliferation and Arms Control program undertakes a wide array of activities, including building the capacity of the International Atomic Energy Agency and its Member States to implement international nuclear safeguards; strengthening domestic and global capacity to detect and prevent illicit transfers of prohibited materials, equipment, and technology; provide technical assistance to the Department of State on the negotiation and implementation of nuclear cooperation agreements and implement the nuclear export control regulations at 10 CFR Part 810, under which the Secretary of Energy authorizes U.S. companies to export unclassified nuclear technology and assistance.

Nuclear Nonproliferation Research and Development

Defense Nuclear Nonproliferation Research and Development directly contributes to nuclear security by developing U.S. capabilities to detect and characterize global nuclear security threats, specifically foreign nuclear material production and weapons development activities, movement, and illicit diversion of special nuclear materials and global nuclear detonations. Irrespective of existing arms control agreements, these capabilities provide the U.S. with the ability to independently detect and verify foreign nuclear weapons development and activities around the world and in outer space.

Current programmatic focus is on the production of nuclear detonation detection satellite payloads in line with the schedule established with the U.S. Space Force; continued development of technical approaches, including remote sensing and AI, to drive early detection of nuclear proliferation; and ongoing infrastructure recapitalization activities to meet future mission objectives and anticipate threats through demonstration and validation in representative environments.

Nuclear Counterterrorism and Counterproliferation (CTCP)

The CTCP program counters nuclear terrorism and nuclear proliferation and responds to any nuclear or radiological threat, incident, or accident worldwide. CTCP acts in an expanded counterterrorism and counterproliferation environment given the growing use and reach of nuclear and radiological material, potential risks inherent in emerging technologies like AI that lower the barrier to access nuclear technical expertise, and the nuclear emergency response implications of a deteriorating global security environment. CTCP harnesses DOE's decades of experience with nuclear weapons and materials, directs it toward understanding substantial and unresolved scientific challenges associated with nuclear threats posed by any adversary, and maintains the capability to respond to those threats in fulfilment of key national security and public safety missions.

To effectively respond to nuclear emergencies worldwide, CTCP is responsible for the Nuclear Emergency Support Team (NEST), an organization of on-call technical specialists trained and equipped to respond to nuclear threats, incidents, and accidents anywhere on Earth. NEST maintains a vast array of capabilities to detect, assess, defeat and attribute the provenance of loose nuclear material or improvised nuclear devices; safely resolve any accidents involving a U.S. nuclear weapon and mitigate impacts to public health and safety during a radiological or nuclear emergency of any scale. NEST executed 27 unclassified emergency response operations

in 2024 and continues this steady operational tempo in 2025 while maintaining 24/7/365 readiness to respond. NNSA was proud to celebrate NEST's 50th anniversary last September, a reflection on half a century of critical, often unseen, work keeping the United States citizens and our interests around the world safe.

CTCP also engages in extensive training and coordination with local, State, and Federal partners to prepare them for a potential nuclear or radiological emergency. These partners have repeatedly and successfully worked alongside NEST for the protection of large-scale national events, including Presidential inaugurations, Super Bowls and the Olympics. CTCP also partners with the FBI to sustain advanced counter-WMD capabilities in 14 major U.S. cities and is building an enhanced baseline capability in each FBI field office to conduct initial counter-WMD operations.

In addition, CTCP assesses emergency response gaps and works to address these through building capable partnerships with State and local communities and international allies so they can counter and respond to radiological and nuclear incidents, accidents and terror threats. These domestic partnerships strengthen and exercise local response coordination. Internationally, NNSA is a leader in nuclear and radiological emergency response. CTCP works to build partnerships capable of countering threats before they reach the Homeland, and, should an incident occur, mitigating impacts to public health and safety to preserve American safety, security, and economic interests.

CTCP also retains extensive nuclear forensic capabilities, which deter a malign State and non-State actors from carrying out a nuclear terror attack. To maintain this deterrent, CTCP is focused on strengthening nuclear forensics capabilities to ensure decisionmakers receive timely assessments that support attribution in the event of a nuclear incident. As with other nonproliferation, counterterrorism and emergency management activities, robust forensics serves as a key complement to our nuclear weapons deterrent, reinforcing the certainty of an American response to any nuclear attack.

NAVAL REACTORS

The Naval Reactors portfolio supports NNSA's close partnership with the U.S. Navy in support of the nuclear fleet. Naval Reactors is advancing naval nuclear propulsion capabilities to keep the U.S. Navy on the cutting edge of warfighting capability, maintaining the assured second-strike capability of the sea-based leg of the nuclear triad, and building the next generation of naval nuclear propulsion infrastructure for continued operational success. Last year NNSA celebrated the75th anniversary of the Naval Nuclear Propulsion Program and its unprecedented record of technological innovation and success.

Naval Reactors is currently working on four major initiatives: Columbia-class ballistic missile submarine reactor systems development; development of future advanced submarine technology to support next generation designs; continued progress on base technology development; and infrastructure recapitalization at program sites, including decontamination and decommissioning efforts leading to a reduction in long-term program liabilities.

These infrastructure efforts include constructing the Naval Spent Fuel Handling Facility at the Naval Reactors Facility in Idaho to recapitalize the capabilities for naval spent nuclear fuel handling that exist in the over–60-year-old Expended Core Facility.

Finally, Naval Reactors continues to support the Australia-United Kingdom-United States (AUKUS) partnership through reimbursable work with Australia and the U.K. NNSA will continue its collaboration with the Departments of State and Defense to advance the goals of the enhanced trilateral security partnership.

FEDERAL SALARIES AND EXPENSES

NNSA's Federal workforce executes the essential government functions of the agency including mission program management, project management, budget development, contract management, and effective oversight of its management and operating contractors.

NNSA's mission is accomplished through the hard work and innovative spirit of a highly talented workforce committed to public service. NNSA is a lean organization that will continue to identify efficiencies to provide an agile and efficient organization to meet evolving mission needs.

CONCLUSION

These are unprecedented times for the nuclear security enterprise. Not since the cold war have we had seven simultaneous weapons programs in the program of

record, and not since the Manhattan Project have we so fundamentally overhauled our infrastructure. Never have we tried to undertake both these tasks at the same time, in an already turbulent international environment. We appreciate Congress' continuous support for our mission priorities. NNSA is committed to delivering modernized weapons on time and at pace to the DOD, safeguarding nuclear materials globally, creating the next generation of naval nuclear propulsion technology, and doing it all while modernizing our infrastructure. There is much work to be done, but I am confident in our ability to succeed. Thank you for the opportunity to appear before you today.

Senator FISCHER. Thank you, Mr. Hoagland. General Bussiere, welcome. Good to see you.

STATEMENT OF GENERAL THOMAS A. BUSSIERE, USAF COMMANDER

General BUSSIERE. Good afternoon, Chairwoman Fischer, Ranking Member King, Members of the distinguished Committee. I have the honor of representing the men and women of Air Force Global Strike Command and to be providing you an update today on our mission, our airmen, our ongoing modernization efforts, and the challenges of sustaining our legacy weapon systems.

I'd like to thank Congress for your continued support for not only our Nation's defense, but for the Air Force's nuclear deterrence and long-range strike missions. My full statement has been submitted for the record. The Air Force Global Strike team has the privilege of executing our Nation's strategic nuclear deterrence and conventional long-range strike missions. My top priority remains maintaining a viable legacy force while modernizing and taking care of our airmen and their families.

Modernization efforts include the Intercontinental Ballistic Missile (ICBM) leg, the B21, the B52 J model, the MH–139 Gray Wolf helicopter, the Survival Airborne Operations Center, our Weapons Generation facility upgrades, our long-range standoff weapons, and the nuclear command and control and communications architecture. This Committee recognizes the serious nuclear threats to our Nation. We face the challenge of deterring two major nuclear powers, China and Russia, who possess both modern and diverse arsenals. Additionally, North Korea poses an escalating threat, and there is the potential of a nuclear armed Iran.

This dangerous and unprecedented security environment is further complicated by the increased coordination among these U.S. rivals. This underscores the importance of fielding a flexible and modern nuclear force to effectively deter them. While Global Strike Command leads the charge in sustaining current forces in deploying future long-range strike weapon systems, we do recognize this is the bedrock of our military strength. It's the foundation of our Nation's defense and essential for assuring our allies and partners.

Equally important to a viable and effective nuclear deterrence is our ability to effectively conduct conventional long-range strike missions. We remain focused on sustaining and modernizing our conventional bombers and fielding improved long-range strike capabilities to provide the Nation with a full range of deterrence options. Through it all, our Striker airmen remain our greatest strength, their dedication, innovation, resilience, make it all possible.

But the world is an uncertain place. We must remain vigilant and continue to invest in our airmen and their families and provide them with the resources, training, and support they need to get the job done we're asking them to do.

The Air Force Nuclear Enterprise is in a critical phase of transition. There is no operational margin remaining and our resources continue to be stretched, impacting the readiness and well-being of our dedicated airmen. Today I request your continued support as we confront these pressing challenges while upholding our Nation's security. Thank you. I look forward to your questions.

[The prepared statement of General Bussiere follows:]

PREPARED STATEMENT BY GENERAL THOMAS A. BUSSIERE

INTRODUCTION

Air Force Global Strike Command (AFGSC) provides strategic deterrence and long-range strike capabilities anytime, anywhere as directed by the President, and the Commander, United States Strategic Command (USSTRATCOM). As a cornerstone of our Interim National Defense Strategy, AFGSC sustains current forces while simultaneously integrating future long-range strike weapon systems. This past August marked the 15th anniversary of AFGSC's establishment, a testament to our vital role as the central force provider for the Air Force's strategic responsibilities, but our command is younger than our weapon systems. The B–2A and B–1B are over 30 years old, and the B–52H just had its 72d birthday. The Minuteman III missile (MMIII) is 55 years old and the overall intercontinental ballistic missile (ICBM) weapon system is even older. The nuclear, command, control, and communications systems (NC3) is built on cold war-era architecture. As AFGSC transitions legacy systems to new technologies, we must achieve balance between critical sustainment of aging systems and continued funding for essential replacements such as the B–21 bomber and the Sentinel ICBM.

AFGSC demonstrates dedication to the Nation's credible deterrent through continuous global engagement. Strengthening deterrence requires a force that is demonstrably lethal, always ready, and operates with shared national security objectives. In 2024, AFGSC planned and executed 33 Bomber Task Force (BTF) events, encompassing 267 days of deployed bomber operations across multiple geographic commands. AFGSC executed more bomber task missions in the last 12 months than the last 20 years combined. The demand signal for BTFs to showcase American airpower, empower allies and partners, and give adversaries pause is significant, and will likely only increase in the future. The 24/7 vigilance of our ICBM force marks 55 years of unyielding resolve afforded by the MMIII. The dedication to our operational tempo, coupled with our focus on people, mission, modernization, and engagement, enables AFGSC to maintain its strategic advantage in both the nuclear and conventional realms.

However, AFGSC faces a watershed moment: there is no remaining margin in our legacy fielded forces but the demand for these capabilities has not waned. Arguably, AFGSC capabilities have never been more important for our overall defense due to the modernization, increasing capabilities, and diversification of the nuclear capabilities of our adversaries. We must never forget the weight of our responsibility in safeguarding national security. Sustaining our legacy systems cannot be overlooked as all hands focus on the daunting challenge of modernizing and recapitalizing all legs of the nuclear triad. AFGSC needs continued support and on-time, stable funding to equip our Airmen to compete effectively in this ever-changing and challenging strategic environment.

GLOBAL SECURITY ENVIRONMENT

The United States and Allies and partners face one of the most challenging threat environments since the cold war, as highlighted by the need to simultaneously deter two major nuclear-armed adversaries and a nuclear-armed rogue nation, the DPRK). China and Russia possess advanced and diverse nuclear capabilities, demanding a complex and multifaceted strategic approach. The Kremlin's deployment of nuclear weapons to Belarus and its plans to aggressively expand its military present new challenges to European security. Additionally, the Democratic People's Republic of Korea (DPRK) has doubled down on expanding nuclear capabilities, and the potential for Iran to develop nuclear weapons remains a grave concern. In an unprece-

dented move, the DPRK has deployed approximately 10,000 troops to support Russia's efforts against Ukraine on the battlefield. Most alarming is the deepening alignment amongst these nuclear-armed actors and the need to be ready to defeat this new axis of aggressors.

As the Department's pacing threat, China continues to pursue an unprecedented military buildup, including the expansion, modernization, and diversification of its nuclear and conventional forces. China's growing stockpile of deliverable air-, ground-, and sea-launched weapon systems pose a challenge to current United States and allied missile defense systems beyond the Second Island Chain. China remains on an accelerated pace to possess 1,000 operational nuclear warheads by the end of the decade, complicating the requirements for United States deterrence globally. China's establishment of new silo fields and new ICBMs will only increase the threat posed by the Chinese Communist Party's (CCP). Consequently, China will possess new options for coercive purposes before and during a crisis or conflict. China is also rapidly modernizing air and sea conventional capabilities with next-generation aircraft such as their stealth H–20 bomber and enhanced naval strike weapons to keep United States and allied forces outside of optimum employment parameters in a regional conflict.

China's nuclear force expansion is complemented by an increasing industrial base capacity to create plutonium from fast-breeder reactors. Of additional concern is China's deepening economic, diplomatic, and military support to and alignment with Russia. China's economic and diplomatic support is helping Russia sustain its war in Ukraine. China and Russia are also expanding their defense cooperation beyond Ukraine; for the first time last year, Chinese and Russian bombers conducted a joint patrol in international airspace off the coast of Alaska.

China's nuclear and conventional expansion efforts, in conjunction with deepening growing ties to Russia, raise the risk to United States and allied forces in the Indo-Pacific region. Despite Russia's heavy losses, it still maintains the world's largest nuclear stockpile with modernized systems and a growing arsenal of novel asymmetric nuclear weapons. Additionally, President Putin announced that Russia reserves the right to use nuclear weapons against any country that poses a critical threat, including from conventional weapons, to Russian or Belarusian sovereignty and/or territorial integrity. Additionally, President Putin stated the participation of, or support from, a nuclear State conducting aggression against the Russian Federation and/or its Allies from any non-nuclear State would be considered a joint attack.

While the DPRK is not an adversary on the same scale as China or Russia, it still presents deterrence dilemmas for the United States and our allies and partners. The DPRK poses a persistent threat and growing danger to the United States Homeland and the Indo-Pacific region. The DPRK continues to expand, diversify, and improve both conventional and nuclear strike capabilities. The development of liquid and solid-fueled missile systems will further complicate our ability to monitor and react to ballistic missile threats. The DPRK has expanded partnerships with both China and Russia, which provides political cover for Kim Jong Un regime's continued nuclear weapons expansion. The DPRK and Russia signed a Comprehensive Strategic Partnership Treaty in June 2024, which includes a mutual defense provision and highlights the deepening strategic alignment between the countries, particularly in their opposition to the United States and our allies. The agreement also codified cooperation in areas such as trade, investment, and nuclear energy. DPRK rhetoric also continues to become more confrontational as the United States and the Republic of Korea conduct strategic exercises and bring strategic assets into the theater. The situation remains tense and any conflict on the Peninsula could involve multiple nuclear-armed actors, thus raising the risk of escalation and nuclear employment.

As of today, Iran does not possess a nuclear weapon and it remains the policy of the United States that Iran be denied a nuclear weapon and ICBM capability; however, Iran is expanding its nuclear program in concerning ways, to include producing highly enriched uranium. Iran continues to enhance military capabilities, holding the largest inventory of ballistic missiles in the region, and funds militia groups as well as terrorist organizations throughout the Middle East. Iran also continues to pursue destabilizing policies across the region, providing material and lethal support to a range of U.S.-designated terrorist organizations and militia groups. Iran's longstanding support to Hamas enabled the October 7th terrorist attack against Israel. Furthermore, Iran's continued support to the Houthis has enabled the ongoing attacks on commercial shipping in the Red Sea and Gulf of Aden and numerous attacks on U.S. forces across the region.

Most concerning are the increasing transactional relationships between nuclear-armed adversaries. This axis of aggressors continues to defy international law through technology exchanges, joint exercises, and mutual support. China and Rus-

sia's "strategic partnership" features extensive military cooperation, with China supplying crucial materials that bolsters Russia's defense industry. Iran provides Russia with drones and missiles, while the DPRK has sent vast quantities of arms, ammunition, and personnel. The continued cooperation raises the possibility of a multi-front war, which necessitates a reassessment of long-term defense strategies and escalation dynamics.

FACILITIES SUSTAINMENT, RESTORATION, AND MODERNIZATION (FSRM)

The current Air Force Installation Infrastructure Action Plan highlights a critical vulnerability for AFGSC, most notably aging facilities and infrastructure coupled with consistent underinvestment in power projection platforms. Installations are increasingly susceptible to both adversarial threats and extreme weather environments, posing an unacceptable risk to the Striker mission. All of these concerns undermine global strike options for our Nation.

Weapons Generation Facilities and Weapon Storage Areas

In addition to modernization of weapon systems, the command continues our long-term plan to recapitalize aging Weapon Storage Areas (WSAs) with facilities known as Weapons Generation Facilities (WGFs). These facilities fulfill a major security initiative for the command and help ensure nuclear security by significantly reducing operational, logistical, and munitions risk. The sequencing and timing of the WGF recapitalization efforts are driven by operational requirements and outdated WSA conditions. Of the seven planned, five are currently in the fiscal year 2025–29 Future-Years Defense Program and four are under construction. Of those under construction, two are bomber WGFs and two are ICBM WGFs. The WGF at Dyess Air Force Base (AFB) is planned for fiscal year 2028, and the design is scheduled to complete this fiscal year. F.E. Warren AFB has seen the first completed WGF and is scheduled to reach full operational capability (FOC) in early 2026. The timing and sequencing of the modernization endeavor are critical to sustaining credible deterrence while ensuring integration of and support to new mission weapon systems.

Supply Chain and Flying Hour Program Challenges

Every weapon system that AFGSC provides must have a defense industrial base robust enough to support the sustainment of operational capabilities in order to maintain a credible deterrent against adversaries. Current and future weapon systems cannot withstand any further supply chain disruptions and must be funded to the maximum extent possible to restore supply chain resiliency. The Air Force must restore readiness and posture, so our platforms will be ready today and for the future.

A critical shortage of parts is severely limiting the bomber execution of the fleet flying hour program. The shortage, driven by diminishing manufacturing sources, materiel shortages, long repair times, and a shrinking industrial base, is reflected in the rising Total Non-Mission Capable Supply rate, leading to increased downtime and cannibalization of parts from other aircraft. Current support and readiness spares packages are insufficient to meet operational demands. This parts crisis directly impacts essential maintenance, hindering both Programmed Depot Maintenance (PDM) and home-station work, reducing operational flexibility.

Diminishing Manufacturing Sources and Material Shortages issues, the lack of vendor bids, and long lead times have resulted in delayed delivery of required parts. These issues have negatively affected Aircraft Availability (AA). Continued support of the Full-Scale Fatigue Testing is imperative to keep the B–52H airframe in use since it has surpassed its scheduled lifespan. Similarly, the Forward Intermediate Fuselage replacement for any high hour airframes must be pursued to maintain the current and future fleet size. We must continue to modernize the B–52H avionics systems to ensure compatibility in joint operations and global airspace.

The E–4B National Airborne Operations Center (NAOC) provides a survivable command and control capability. The fleet is approaching end-of-service life and faces sustainment challenges. The low density/high demand dynamic of the platform prioritizes AA as the E–4B 's top concern. Along with aircraft age, other factors include lengthening PDM times, diminished manufacturing sources, and parts obsolescence. Initiatives such as PDM flow optimization, KC–10 engine long-core procurement and overhaul, and recovering unused 747–200 parts from a NASA aircraft retirement action have shown some success toward mitigating known sustainment issues.

The E–4B Program Office will also sustain and modernize mission system capabilities until the replacement platform, the Survivable Airborne Operations Center (SAOC), is operational. Current examples of successful ongoing modernization programs include a Low Frequency Transmit System, Family of Advanced Beyond

Line-of-Sight Terminal and Survivable Super High Frequency systems. Additionally, as the E–4B gets closer to SAOC transition and subsequent end-of-life, AFGSC will balance modernization efforts and AA.

OPERATIONS

ICBM Operations

The modernization of the U.S. ICBM force is critical to maintaining a credible and effective nuclear deterrent. ICBMs are the most responsive leg of the U.S. nuclear triad providing rapid global strike capability. The Sentinel program is a massive undertaking that is pivotal to U.S. national security and represents the Air Force's most critical recapitalization effort to date. The sheer size, scale, and scope of this effort cannot be overstated as the entire system is being rebuilt from the ground up. Even with its inherent complexities, Sentinel remains essential to national security and there are no alternatives to the program that provide acceptable capability to meet joint requirements at less cost as certified by the Department of Defense (DoD) to Congress in 2024. By enhancing the accuracy, security, and reliability of the U.S. ICBM force, Sentinel will ensure the effectiveness of this critical leg of the U.S. nuclear triad.

ICBM Modernization Roadmap

In 2024, the Sentinel program underwent a Nunn-McCurdy review to address cost overruns exceeding 37 percent. The Department's final Nunn-McCurdy estimate determined the cost increase to be 81 percent. In response, AFGSC immediately initiated a comprehensive review of both system requirements and Concept of Operations (CONOPS). The ongoing process focused on refining system requirements, operational concepts, and fostering collaboration between stakeholders to ensure a cost-effective and successful modernization of the ICBM force.

RV Modernization: The ICBM warhead stockpile continues to fulfill USSTRATCOM mission requirements beyond its planned lifespan. AFGSC engages in efforts with DOD partners to produce fuse replacements for the existing stockpile of Mk21s to support Sentinel initial operational capability (IOC). This effort not only strengthens the industrial base but also establishes a framework for future capabilities, ensuring the land-based leg of the nuclear triad remains a robust and adaptable strategic deterrent.

Collaborative Leadership for Sentinel Success

Unified Approach: AFGSC and the Air Force Nuclear Weapons Center (AFNWC) have formed a strong partnership to address Sentinel challenges and accelerate ICBM modernization efforts. Leadership from both organizations collaborate regularly through integrated partner teams, General Officer Steering Groups, and Executive Steering Boards to proactively resolve issues and ensure alignment.

Revalidated Requirements: Since July 2024, AFGSC has spearheaded an effort to revalidate and recertify all Sentinel requirements to maintain performance. The objective is to work toward a cost-effective strategy for the program, expected to be refined by the end of the year. All requirements were traced to source documentation for need and military utility. The collaborative effort between AFGSC and AFNWC assures the Sentinel program delivers a weapon system that meets all strategic requirements.

Evolving Concept of Operations: The Sentinel CONOPS serves as a critical communication tool, clearly articulating operational requirements to both the acquisition community and contractors during the design phase. The Weapon System Requirements and current CONOPS were reviewed and signed in March 2025.

Site Activation Task Force (SATAF) Achievements

In October 2024, the Sentinel program transitioned from Program Integration Offices to fully operational Task Force at F. E. Warren AFB, Malmstrom AFB, and Vandenberg Space Force Base (SFB). Minot AFB is progressing to establish its task force presence, marking a significant milestone in the program's execution. Simultaneously, Sentinel support facilities are undergoing preparations to accommodate Sentinel-assigned personnel and equipment at these bases, ensuring a smooth transition while safeguarding operational readiness of the MMIII weapon system.

Local engagements

The Director of ICBM Modernization continues to take a holistic approach to Sentinel education and socialization by visiting the three missile wings and engaging in dialog with community members. These engagements offer an opportunity to address concerns from the local population and leaders within the areas impacted by

the Sentinel weapon system. These conversations will continue with community town hall meetings through 2025.

While many aspects of the Sentinel program are going right, we must remain vigilant and fully committed to the unparalleled recapitalization of a critical component of our national security. Maintaining the MMIII weapon system while concurrently bringing Sentinel online demands careful and sustained attention. The Sentinel program is not just about modernization—it is about preserving peace through strength.

SECURITY RESPONSE FORCES

Our nuclear security teams, comprised of steadfast and highly trained professionals, stand ready to defend our Nation's nuclear arsenal. However, they face a rapidly evolving threat landscape that requires constant adaptation and support. Our leaders are actively addressing the complex challenges of organizing, training, and equipping these defenders to meet current and emerging threats, from countering unmanned aerial system (UAS) activity to operating in extreme weather conditions at our bomber and missile bases. Their crucial mission demands unwavering focus and investment as it remains central to USSTRATCOM operational plans and national security.

To enhance the safety and lethality of our Security Forces, AFGSC is modernizing its vehicle fleet. This modernization effort directly addresses serious safety concerns surrounding the aging Up-Armored High Mobility Multi-Purpose Wheeled Vehicles (UAHMMWV), a platform tragically linked to multiple fatal rollover accidents at AFGSC ICBM wings, resulting in the loss of two defenders in 2023 and 2024. The Joint Light Tactical Vehicle (JLTV) is a modern and improved tactical vehicle providing better field of view, suspension systems, and modern safety features compared to the currently employed UAHMMWV. I continue to request congressional support to field AUVs to reduce the risk of mishaps and unnecessary loss of life.

As AFGSC navigates these modernization efforts, the arrival of the MH–139A Grey Wolf marks a positive step toward strengthening the security posture of the ground-based nuclear deterrent. The MH–139A provides greater speed, range, and carrying capacity above the current UH-IN fleet. Following successful testing, the MH–139A is on track for IOC in 2025, with full deployment across all ICBM bases by 2027.

As of February 2025, 13 MH–139A helicopters have been delivered—seven to Malmstrom AFB, three to Maxwell AFB, and two are in retrofit status for the environmental control system and radio. The current buy profile procures 19 aircraft, 11 of which will field at Malmstrom AFB and eight at Maxwell AFB by August 2025. The arrival of the MH–139 Grey Wolf marks a decisive upgrade for AFGSC, bringing a more lethal presence to the defense of the ground-based nuclear deterrent.

Counter-Unmanned Aerial Systems

Since 2016, AFGSC, with crucial backing from USSTRATCOM, has made strides in counter-unmanned aircraft technology to strengthen our national deterrence. During 2024, two U.S. military bases experienced security breaches involving UAS, raising concerns about this growing threat. In August, multiple UAS conducted a week-long surveillance operation over Plant 42 in California, potentially gathering intelligence on classified projects. In November, a Chinese citizen was apprehended for using a UAS to photograph Vandenberg SFB. These incidents underscore the vulnerability of military installations to UAS surveillance and the potential compromise of national security.

We must match our capabilities to the threats we face. The Joint Counter-small Unmanned Aircraft Systems C-sUAS Office and Office of the Secretary of Defense for Acquisition and Sustainment lead the overall DOD effort to combat current and future UAS threats, and United States Northern Command is the synchronizer for Counter-UAS (c-UAS) efforts in the Homeland. In recognition of this growing challenge, the Department launched Replicator–2, a whole-of-department and interagency effort to improve c-sUAS protection for critical assets, largely centered on the Homeland (CONUS). AFGSC is actively contributing to these efforts as well as leveraging internal innovation endeavors to seek solutions for the specific challenges our forces face from UAS, especially as they relate to operations in the ICBM missile fields and defense of our WSAs and WGFs. As we modernize our nuclear capabilities over the coming decade, we must also prioritize modernizing our defenses against UAS threats.

The United States must maintain military superiority by integrating new technologies while sustaining existing capabilities. AFGSC will work with the Secretary of the Air Force's staff to obtain waivers of the 5-year "sunset" prohibition on modernizing aircraft scheduled to retire, (as codified in Section 2244a of Title 10) as doing so is clearly in the national security interest of the United States. Leveraging this statutory authority for the B–2A is essential to maintaining long-range global strike nuclear deterrent capabilities while completing modernization programs impacting all Air Force bombers.

Nuclear Requirements and Conventional Long-Range Strike Mission

Conventional long-range strike capabilities are equally important and must evolve to address emerging threats. AFGSC must maintain the ability to hold any target at risk, anywhere in the world, at any time. Our airmen routinely demonstrate this capability through CONUS-to-CONUS missions and BTF deployments, reinforcing allied confidence and deterring adversary aggression. The future of conventional long-range strike will be shaped by a two-tiered approach. The B–21 Raider and its family of systems will provide advanced stand-in capabilities by leveraging next-generation stealth, sensing, and precision-strike technology to penetrate contested environments. Simultaneously, the B–52H, armed with the Standoff Attack Weapon, will deliver massed fires from outside heavily defended areas. This integrated force will enable AFGSC to generate a persistent, scalable, and lethal global strike capability, ensuring dominance across the spectrum of conflict.

B–21 Raider

The B–21 is the most exquisite weapon system ever built. At its core, the B–21 enhances deterrence by ensuring the United States can hold any target worldwide at risk, even in contested regions protected by sophisticated air defense systems. We are building on lessons learned from the B–2A to give the B–21 a survivability edge in high-threat environments. The B–21's ability to penetrate and persist in hostile airspace makes it uniquely suited for both deterrence and, if needed, decisive action.

Beyond its combat capability, the B–21's strategic value is amplified by its role in a broader network of systems. This makes it more than just a bomber—it is a force multiplier that enhances situational awareness and joint operations. Its design also emphasizes adaptability, with a modular structure and digital engineering that allow rapid upgrades to counter new threats, ensuring relevance for decades.

From the outset, the B–21 program has leaned forward and considered sustainment while the design was in development. As a result of those early considerations, the B–21 program is ahead of schedule on certain portions such as technological data, product support, and material readiness. Affordability, combined with easier maintenance due to advancements in stealth coatings and manufacturing, supports a larger, more sustainable fleet, which will be key for deterring adversaries who might otherwise exploit any gaps a smaller force could create. We must continue looking at how to right-size the bomber fleet to meet the demands the Nation is asking of it.

The B–21's dual nuclear and conventional capabilities are critical as competitors seek to challenge us by operating below nuclear thresholds. As a result, the United States must also deter using conventional weapons tailored to meet the needs and capabilities of the B–21; if we lose the ability to deter malicious regional actions via a combination of stand-in and standoff, nuclear, and conventional effects, we play into adversary anti-access/area denial aspirations. The B–21's fusion of stealth, versatility, scalability, and enduring design strengthens U.S. deterrence, ensures credible response capabilities, and offers cost-effective modernization for maintaining tactical and strategic advantage in the 21st century. The success of the B–21 Raider program is a testament to the unprecedented collaboration among our military and civilian experts. The seamless integration of operational, acquisition, and industry professionals—specifically, the mighty Eighth Air Force, the Rapid Capabilities Office, and Northrop Grumman—is the driving force behind this program's remarkable progress. This synergistic partnership enables us to develop and field the world's most advanced platform unrivaled in its ability to project power globally at a time and place of our choosing.

B–2A

The B–2A is the USAF's sole penetrating bomber, providing unmatched stealth and strike capability, making it a cornerstone of both conventional and nuclear deterrence. Targeted modernization in low observable signature and supportability modifications, communications upgrades, and weapons delivery ensures the B–2A maintains its lethal edge through B–21 fielding. The Adaptable Communications

Suite is entering test and evaluation with efforts to accelerate fielding in fiscal year 2026. The B–2A Displays Modernization Program is currently in test and evaluation and is anticipated to enter the Production and Deployment Phase (Milestone-C) in 4Qfiscal year 2025, alleviating the second Mission Impaired Capability Awaiting Parts driver for the B–2A fleet. These modernization efforts are essential to bridge the capability gap until the B–21 reaches FOC.

B–1B

The B–1B platform remains a conventional force workhorse until the B–21s are fully fielded. Time and again, B–1Bs have taken the lead in combat, demonstrating their critical role in combat operations. This, in addition to their enduring participation in the DOD's BTFs, is designed to demonstrate that the United States can reach any target in the world with minimal risk to its forces. The B–1B is currently undergoing the most significant modernization program in its 30-year history. Through the B–1 Embracing Agile Scheduling Team program, the B–1B received a suite of accelerated upgrades, including enhanced friend-or-foe identification, more secure communications, and improved defensive systems. The program also introduced valuable new tools like a modernized simulator and digital twin technology, enabling more effective training and proactive maintenance. As both a proven combat platform and a cornerstone of future deterrence strategies, the B–1B will remain a vital asset for projecting American airpower well into the 21st century.

B–52H

The B–52H Stratofortress remains the backbone of the USAF, providing unmatched long-range strike capability and heavy payload capacity for the past 70 years. Even today, the B–52H continues to demonstrate its relevance in operations around the world. To ensure the B–52H can continue to deliver this level of combat power for decades to come, AFGSC is undertaking major modernization efforts for its aging B–52H fleet, aiming to extend its service life beyond 2050. This includes re-engining the bomber with Rolls-Royce Fl30 turbofans, upgrading its radar to an Active Electronically Scanned Array system for improved reliability and mission effectiveness, and procuring a new Weapon System Trainer to simulate future B–52H configurations and capabilities. The B–52H's modernization into the B–52J platform is not just about upgrades—it is essential for viability of the bomber.

Even as we upgrade to the more lethal B–52J, global demand for BTFs is surging, not subsiding. B–52H deployments showcase the importance the United States places on assuring Allies and partners as the visible presence of our bombers, airmen, and integrated operations provides a critical deterrent against potential adversaries. This demand for a strong, responsive bomber presence will only intensify in the coming years, making our modernization efforts all the more urgent.

Air-Launched Cruise Missile (ALCM) to Long Range Standoff (LRSO)

The Air Force is replacing its aging ALCM with the LRSO weapon, which is being designed, developed, and deployed as a modern nuclear-capable cruise missile. The LRSO program is progressing well, having achieved a successful design review and currently undergoing flight testing.

AIRBORNE OPERATIONS CENTER

AFGSC's NC3 architecture connects our Commander-in-Chief and command authorities to forces around the globe, before and during conflict. One component in this NC3 network is the NAOC, which is always on alert to connect the President, Secretary of Defense, Chairman of Joint Chiefs of Staff, and senior leaders.

The E–4B Program Office will sustain and modernize mission system capabilities as necessary through the transition period until the replacement platform is operational. The Sierra Nevada Corporation—SAOC contract is progressing well. Three aircraft were received in April 2025, and we are on track to receive an additional two in September 2025. The Integrated Baseline Review was completed in October 2024 and the System Requirements Review and Digital Data Package process are both on track. The SAOC program stands to mitigate all issues within the current NAOC fleet as well as serve as a next-generation aircraft that will be postured to directly support the President, the Secretary of Defense, and the Chairman of the Joint Chiefs of Staff well into the future.

This need for reliable command and control is met in part by the newly activated 95th Wing, which brings together specialized units to ensure seamless execution of strategic operations. The 95th Wing now provides combatant commanders with assured command and control (C2) over assigned forces through global command, control, and communication capabilities. The wing organizes, trains, and equips the total force to execute strategic requirements as set forth by commanders.

Operating under 8th Air Force and AFGSC, the 95th Wing incorporates existing units from across different components of the Air Force. These include the 595th Command and Control Group, the 253d Command and Control Group; and the 610th Command and Control Squadron. This integration forms a cohesive and powerful unit.

NUCLEAR COMMAND, CONTROL, AND COMMUNICATIONS (NC3)

AFGSC plays a critical role in ensuring robust NC3 capabilities. We are responsible for the Strategic Readiness and effectiveness of our Air Force's nuclear deterrent forces, which hinges on reliable NC3. These efforts ensure vital NC3 systems are integrated into my portion of our Nation's strategic nuclear enterprises.

Furthermore, AFGSC and the United States Space Force (USSF) have critical interdependency when it comes to NC3. Space-based assets are integral to NC3 by providing early warning of missile launches and enabling swift decisionmaking and response options. Satellites provide secure communication channels between national leaders and nuclear forces, ensuring reliable transmission of orders and information. Through coordinated efforts, AFGSC and USSF unlock amplified capabilities that exponentially enhance the effectiveness and resilience of the Nation's strategic deterrence. For example, AFGSC is integrating the Advanced Extremely High Frequency system into our ICBMs, bomber forces, and command posts. AFGSC is also advancing efforts to enhance survivable beyond-line-of sight communications for the bomber force, including the development of High-Speed Terminals.

Additionally, we continue reexamining legacy technologies through a modern lens. Long established high-frequency waveforms are now benefiting from digital software-defined radios, which enhance performance and provide critical redundancy in the event of space-based system failures. In the Very Low Frequency domain, we continue to modernize our receivers with smaller, plug-and-play replacement solutions that enable seamless upgrades while maintaining compliance with cryptographic standards. Additionally, our Senior Leader Network remains a vital asset, ensuring strategic decisionmakers in Washington have reliable worldwide communications and services in times of crises.

NC3 is the cornerstone of America's deterrence posture. AFGSC continues to leverage industry and academia to pursue next-generation technologies including protected satellite communications for secure connectivity, artificial intelligence (AI) powered cyber defense for real-time threat detection and mitigation, and integrated multi-domain command and control for faster, more adaptable agile decisionmaking. Every day, AFGSC hones this strategic capability, ensuring that if called upon, we will be ready.

AIRMEN AND FAMILIES

The unwavering dedication of our Striker Airmen, who work tirelessly 24/7, truly enables AFGSC to stand ready to face any challenge or threat, even as our advanced weapons systems and modernization efforts capture global attention.

Innovation

Maintaining our competitive edge demands a steadfast commitment to innovation, a commitment embodied by our resourceful and dedicated Airmen. STRIKEWERX, the Global Strike innovation hub, stands as a testament to this commitment. Recognizing that our airmen are our greatest asset, we have fostered an environment where ingenuity can flourish. We connect Airmen with industry experts and academia, sparking partnerships that drive rapid and impactful technological improvements.

We continue to adapt and adopt inexpensive commercial sector technologies, including improving bomber pilot training, modernizing bomber crew alert communications, training for emergency situations more realistically, and providing our security forces with more effective technology as they secure our nuclear capability. Airman ideas have produced tangible results, including operationally fielded B–52H engine pod covers and deployable maintenance structures to facilitate operations in frigid conditions at our northern bases. This ability to rapidly translate innovative ideas into executable solutions underscores AFGSC's dedication to equipping warfighters with leading-edge technologies.

To combat recurring engine failures in B–52Hs at Minot AFB caused by extreme cold, engineers developed a new engine inlet cover design incorporating a heating duct. This initiative, culminating in the "Strike Tank 2023" project approved in October 2023, saw delivery of testable prototypes by June 2024. These covers, offering full engine encapsulation and a heating mechanism, proved so effective that 12 were immediately procured for operational testing. By August 2024, the success of the

covers led to equipping the entire Minot B–52H fleet. This proactive solution saves an estimated 7,500 maintenance hours per year and prevents costly engine damage, showcasing a remarkable return on investment in operational readiness.

In addition, we are empowering Airmen to harness the power of data analytics and AI. The Command uses AI to project trends in operational status and quickly address and identify problem areas. Our use of centrally funded Air Force cloud platforms brings together enterprise and Command data to inform the Commander's risk assessment. The Command uses commercial AI/machine learning offerings within the USAF data fabric to accelerate business processes. AFGSC is also one of the most prolific users of robotic process automation tools in the USAF. By providing access to cutting-edge tools and training, we enable Global Strike Airmen to develop and leverage secure cloud-based applications that streamline processes and maximize the efficiency and effectiveness of our personnel.

Missile Community Cancer Study

The health and well-being of our Airmen and their families is a top priority. This is why AFGSC teamed up with the USAF School of Aerospace Medicine (USAFSAM) in 2023 to conduct a thorough investigation to address concerns about a possible link between working on missile fields and cancer. The Missile Cancer Community Study includes a comprehensive environmental analysis. Over 2,400 samples are being collected and analyzed in three phases across three Missile Wings and Vandenberg SFB. With two rounds of sampling already completed, the investigation revealed trace amounts of polychlorinated biphenyls (PCBs) exceeding the Environmental Protection Agency (EPA) recommended threshold on 4 out of 1205 total surface swipe samples. To ensure the safety and well-being of our Airmen, Missile Alert Facilities with PCBs above the EPA threshold were promptly and thoroughly cleaned. They have since passed rigorous safety inspections and are now back in full operation. Initial findings from phases IA and 1B of the epidemiologic study have shown no increase in cancer rates among our Missile Community compared to the non-Missile Community or the general U.S. population. This includes data on 14 common cancers.

Additionally, Phase 1C did not identify a statistically significant elevated mortality of these cancers in the Missile Community when compared to the general U.S. population. While the initial phases of our study have been reassuring, we are committed to gathering the most comprehensive data possible. To that end, we are incorporating State cancer registries into the second phase of our study to gain a complete understanding of potential health risks within the Missile Community. Phase 2, scheduled for completion by the end of 2025, will offer a more complete and detailed analysis of cancer incidence within the Missile Community. AFGSC is actively engaging with leading health organizations such as the USAFSAM, the Defense Centers for Public Health, and Veterans Affairs throughout this process. To ensure full transparency, we hold quarterly town hall meetings, provide updates on a dedicated webpage, and share findings with stakeholders to ensure our Airmen and families are informed. We understand this is about more than just data—it is about the health and peace of mind of our Airmen, their families, and our veterans. We are unwavering in our commitment to providing them with clear, accurate information and ensure complete transparency throughout this process. They deserve nothing less.

Professional Military Education and Development

Building a culture of excellence and pride within AFGSC is key to maintaining the warrior ethos and achieving mission success. My AFGSC Force Development Division is committed to providing our personnel with the knowledge, skills, and experiences necessary to excel and lead our command with distinction.

AFGSC partners with Air University to modernize Professional Military Education (PME), particularly Intermediate Developmental Education (IDE). Our flagship effort is the School of Advanced Nuclear Deterrence Studies at Air Command and Staff College, which develops deterrence and assurance experts equipped to advise senior leaders across the DOD. AFGSC also participated in the successful Agile Learning pilot program, an IDE modernization initiative focused on flexible, mission-relevant learning experiences. Building on this success, AFGSC is committed to exploring the full potential of innovative programs like Agile Learning. Beyond officer PME, AFGSC provides high-quality professional development opportunities for enlisted Airmen, including unique, mission-focused content incorporated into Enlisted

Robust pre-command education is also critical. The Nuclear Stewardship Executive Course provides Group and Wing Commanders and their Senior Enlisted Leaders with a deep understanding of their nuclear mission responsibilities. Our AFGSC

Command Team Course unites Squadron Commanders and their Senior Enlisted Leaders, forging a shared understanding and purpose. Through this course, they gain the knowledge and skills to lead their squadrons as one cohesive force, effectively executing this critical mission. We continuously assess and refine our pre-command education to ensure relevance and efficacy in preparing commanders for the complexities of the nuclear enterprise.

In addition to education and training, AFGSC offers coveted internships-including AFGSC Intern, Striker Trident, Striker Titan, and Striker Trailblazer-providing exceptional officers, enlisted personnel, and civilian Airmen with invaluable hands-on experience in the nuclear enterprise. The Academic Partnerships in Nuclear Education program collaborates with academic institutions to provide Airmen access to advanced education in fields like defense and strategic studies, nuclear deterrence, and engineering management.

These initiatives, alongside our Air Force Reserve Officer Training Corps Summer Internship Program, are key to attracting and developing top talent for AFGSC. By cultivating an environment where individuals are recognized and rewarded based on their abilities, performance, and contributions, we aim to attract the best and brightest. Upholding rigorous standards for our Airmen is non-negotiable, as it directly contributes to mission accomplishment and the long-term health of our command.

To encourage individual drive, recognize excellence, and cultivate a strong sense of pride within its ranks, AFGSC is exploring various strategic initiatives focused on enhancing both talent management and retention rates. The Personnel Division has launched a series of "sprints" to rapidly analyze data and assess recommendations that will enhance transparency in the assignment process, as well as incentivize AFGSC bases.

AFGSC is working on restoring recurring Career Field Health Briefings and expanding the Commander's Nuclear Focus list to include additional Air Force Specialty Codes (AFSCs). In line with improving retention, AFGSC reevaluated Selective Reenlistment Bonus (SRB) multipliers based on recommendations from the RAND study and updating related policies. The input from key AFSCs regarding SRB adjustments is under review.

AFGSC addressed quality of life by introducing a one-time cold weather pay incentive for Airmen stationed at northern tier locations such as Malmstrom and Minot AFB, effective from 1 April 2024. In addition, AFGSC with assistance from the Assistant Secretary of the Air Force for Manpower and Reserve Affairs, instituted a civilian retention incentive in order to retain top civilian talent. The 10 percent monetary incentive is calculated as a percentage of the employee's rate of basic pay.

These initiatives prioritize transparency, flexibility, and competitive compensation to effectively align talent management with the demanding requirements of the Strategic Nuclear Deterrence mission. By investing in its Airmen, AFGSC reaffirms its commitment to its workforce and strengthens America's fighting force.

Defense Health Agency

The current State of healthcare within AFGSC needs attention. The Defense Health Agency (DHA) recently reorganized and established a Personnel Reliability Program Tiger Team to address gaps that could jeopardize the readiness of our Airmen and their families, particularly with the impending B–21 bed-down at Ellsworth AFB. While the Tiger Team addressed some concerns, the lack of a Surety Support Coordination Cell highlights a lack of uniformity. Chronic underfunding and staffing shortages across the Military Health System worsen our DHA's ability to provide timely and quality care. This chronic instability, resulting in hundreds vacant positions at MTFs on Air Force Bases, directly impacts mission readiness and reduces access to care for military families.

CONCLUSION

AFGSC stands at a watershed moment. The world is watching as we simultaneously sustain aging cold war systems and usher in a new era of strategic deterrence. We are modernizing at a significant pace while ensuring legacy systems remain ready to answer the Nation's call. We are tackling challenges head-on, including aging infrastructure, supply chain disruptions, or the need to counter evolving threats like UAS. Through it all, our greatest strength remains our Striker Airmen—the heart and soul of AFGSC. Their dedication, innovation, and resilience are the driving force behind our success. However, we cannot afford to be complacent and must remain vigilant in the face of growing threats. We must continue to invest in our people, ensuring they have the resources, training, and support they need to carry out their critical mission. With unwavering commitment to our mission and

steadfast congressional support, AFGSC will continue to deter aggression, assure Allies, and safeguard our Nation's security, now and into the future.

Senator FISCHER. Thank you, General. Admiral Wolfe, good to see you.

Admiral WOLFE. And good to see you.

Senator FISCHER. Welcome.

STATEMENT OF VICE ADMIRAL JOHNNY R. WOLFE, JR., USN
DIRECTOR FOR STRATEGIC SYSTEMS PROGRAMS

Admiral WOLFE. Chairwoman Fischer, Ranking Member King, and distinguished Members of this Subcommittee, it is an honor to be here and a privilege to continue representing the servicemembers, civilians, and families of the Navy Strategic Systems Programs, SSP. I'd like to thank Congress for its continued support in providing us with the resources required to execute our assigned mission. I have submitted my posture statement for the record.

I'll begin by assuring you that the Navy's nuclear forces, the bedrock of our national security are safe, secure, effective, and credible. As the Navy command that provides cost effective, safe, and secure, sea-based strategic deterrent solutions, SSP is entrusted to provide cradle to grave lifecycle support to three critical programs.

The Trident II(D5) Strategic Weapons System, the Navy's Conventional Prompt Strike Hypersonic program, and the Nuclear Armed Sea Launch Cruise Missile, SLCM-N program. These are three of the Nation's highest priority acquisition programs and with your support, they ensure the Navy is delivering peace through strength.

SSP ensures the highest levels of readiness and modernization for the Trident Strategic Weapon System, which underlies our national strategy to deter any adversary who threatens United States, our allies, or our interest. As the most survivable leg of the triad, the ballistic missile submarine force represents a substantial portion of our Nation's deployed nuclear warheads, providing an unyielding foundation for assured response against any adversary.

The Navy strategic deterrent stands at a critical juncture. To maintain our advantage in the face of evolving threats, we must prioritize the modernization of our nuclear infrastructure and industrial base. A strong domestic industrial base is the foundation of a credible deterrent. Using resources authorized by this committee, SSP is actively working to revitalize this natural interest, ensuring the timely production and delivery of critical strategic weapon system components while fostering American jobs and technological superiority.

Our modernization needs cannot succeed without investing in research and development. The critical skills for our workforce and the facilities needed to produce, sustain, and certify our strategic systems. Our infrastructure is also at an inflection point. Existing facilities are reaching their 30-year recapitalization windows as we enter into a once in a generation transition of both the Trident Strategic Weapons System and the Ballistic Missile Submarine Platform. In accordance with the fiscal year 2024 NDAA, SSP has established a SLCM-N program office and over the past year, we

have focused on conducting the assessments needed to deliver a weapon system that meets war fighters' needs.

Executing this program requires a careful balancing of resources to ensure existing critical Navy and Air Force programs of record and our submarine fleet are not adversely impacted. SSPs mission, strategic deterrence, is critical to this Nation. It is the foundation of the National Defense Strategy and is a top priority of the Department of Defense.

In order to accomplish all of all three national missions, SSP relies on a relatively small number of trained, skilled employees, and it is critical that my command is able to appropriately staff its workforce with these highly specialized technical experts. People are as foundational to our nuclear deterrent as the strategic weapons themselves.

As the 14th Director of Strategic Systems programs, I have absolute faith and confidence in the safety, security, effectiveness, and credibility of our Nation's strategic deterrent due to the proficiency and professionalism of the dedicated service members and civilians who have made strategic deterrence their life's work. With continued congressional support and stable on-time funding, the Navy will continue to effectively defend our Nation and preserve peace for future generations.

Thank you for the opportunity to testify and I look forward to your questions.

[The prepared statement of Admiral Wolfe follows:]

PREPARED STATEMENT BY VICE ADMIRAL JOHNNY WOLFE

INTRODUCTION

Strategic Systems Programs' (SSP) mission is to deter strategic attack by providing credible and affordable nuclear and non-nuclear capabilities to the Warfighter to underwrite the security of our Nation. As the Navy command that provides cost-effective, safe, and secure sea-based strategic deterrence solutions, the SSP team is entrusted to provide cradle-to-grave lifecycle support to three critical programs: the Trident II D5 Strategic Weapon System (SWS), Conventional Prompt Strike (CPS) hypersonics, and the Nuclear-Armed Sea-Launched Cruise Missile (SLCM-N) programs.

The U.S. nuclear triad's most survivable leg is provided by the sea-based strategic deterrent (SBSD). This force represents a substantial portion of our Nation's deployed nuclear warheads, providing an unyielding foundation for assured response against any adversary. The SBSD encompasses a formidable network of assets: the strategic nuclear-powered ballistic missile submarine (SSBN) force, the Trident II SWS and its associated nuclear warheads, the Navy Nuclear Command, Control, and Communications systems, and the crucial shore-based maintenance and security infrastructure. Underpinning these capabilities is a wide-ranging industrial base, ensuring the sustainment and modernization of this vital deterrent for decades to come.

MAINTAINING UNMATCHED STRENGTH AND LETHALITY

SSP's core mission supporting the sea-based leg of the nuclear triad comprises two fundamental lines of effort: the safety and security of our Nation's strategic assets entrusted to the Navy; and the design, development, production, and sustainment of the Navy's SWS. We strive to maintain a culture of excellence, underpinned by rigorous self-assessment, to achieve the highest standards of performance and integrity for personnel supporting the strategic deterrent mission. We focus unrelentingly on our tremendous responsibility for the custody and accountability of our Nation's nuclear assets. The men and women of SSP, our Sailors, our Marines, our Navy Masters at Arms, our Coast Guardsmen, and our industry partners remain dedicated to supporting the strategic deterrence mission, ready to respond to the emerging needs of our Warfighter, and committed to protecting and safeguarding our Na-

tion's assets with which we are entrusted. Thank you to the congressional defense committees for your unwavering and continuing support for our critical mission.

The safety, security and reliability of the Navy's nuclear weapons is SSP's highest priority. The SSP flight test program measures performance and reliability of the SWS in order to ensure military effectiveness. SSP has successfully conducted 193 flight tests of the Trident II missile—the most recent of which occurred in April 2025. Furthermore, the Navy strictly complies with the Nuclear Weapons Surety Standard for all nuclear weapons in its custody and regularly evaluates itself to ensure we are meeting those standards. The Trident II program is safe, secure, and highly reliable.

SSP PRIORITIES: LETHALITY, WARFIGHTING, HOMELAND DEFENSE

SSP approaches our mission through the lens of our three main priorities:

- *Lethality:* SSP ensures the highest levels of readiness and modernization for the Trident II (D5) SWS, providing critical support to the U.S. national strategy to deter any adversary who threatens the United States, our allies, or our interests.
- *Warfighting:* Our unwavering focus on designing, developing, and deploying the most advanced SLBM, SLCM-N, and hypersonic technology ensures the U.S. Navy maintains its competitive edge in an increasingly contested maritime domain.
- *Homeland Defense:* As the most survivable leg of the nuclear triad, the SBSD, under SSP's stewardship, stands constant, providing an unshakeable deterrent against attack on our Homeland.

STATE OF THE PROGRAM

Today's strategic nuclear triad benefits from the strategic foresight and the decisions of those who have come before. Strategic investment into a nuclear weapons support infrastructure promoted both the safety and longevity of the SWS as well as the high levels of security required for weapons of such importance. After seven decades of use, the Navy must revitalize and build the capacity that will allow this infrastructure to continue to meet Warfighter requirements in the face of evolving threats. In addition to revitalizing legacy infrastructure to sustain SWS shore operations, the Nuclear Enterprise, and SSP in particular, must prioritize expanded and new infrastructure to promote the safety, security, efficacy, and credibility of the SWS through 2084. These investments will be made in weapon design and development capacity, transportation and storage infrastructure, technical operations, and nuclear weapons security facilities.

A minimum of 12 *Columbia*-class SSBNs, each equipped with 16 missile tubes, will replace the current fleet of 14 *Ohio*-class SSBNs, each equipped with 20 operational missile tubes (in accordance with the New START Treaty). The continued demonstrated high performance of the SWS will ensure the *Columbia*-class meets U.S. Strategic Command (USSTRATCOM) direction to meet requirements derived from Presidential guidance. A decrease in demonstrated performance could impact the Navy's ability to meet USSTRATCOM requirements, which establish the minimum force necessary to deter adversary attack against the Homeland and to provide the President with an assured survivable second-strike capability. For this reason, the Navy must maintain a robust *Ohio*-class SSBN age management program to avoid a degradation in mission capabilities in the transition as the *Columbia*-class SSBN prepares to enter service.

The SBSD stands at a critical juncture. Decades of strategic foresight have delivered an unparalleled capability; but to maintain our advantage in the face of evolving threats, we must prioritize the modernization of our nuclear infrastructure and industrial base. SSP will continue to balance the following priorities as we move into a new era of balancing sustainment and new programs:

- *Prioritizing Modernization:* With their advanced capabilities, the *Columbia*-class SSBN combined with its Trident SWS, represent a generational leap forward in our undersea deterrent. With improvements in the SSBN platform come upgrades to the SWS as well—both the Trident missile and its warhead. SSP is fully committed to ensuring a seamless transition from the *Ohio*-class SSBN, leveraging existing infrastructure while modernizing the SWS to meet the demands of the future.
- *Revitalizing the Industrial Base:* A strong domestic industrial base is the bedrock of a credible deterrent. SSP is actively working to revitalize this vital national asset, ensuring the timely production and delivery of critical SWS components while fostering American jobs and technological superiority.

- *Confronting Emerging Threats:* In light of the ever evolving threat landscape, SSP is fully committed to investing in strategic deterrence technologies, including SLCM-N and conventional hypersonics, and strategies to protect our strategic assets from those who seek to undermine our national security.
- *Balancing Systems Integration:* SSP is the system integrator for the SWS. This requires our civilian workforce with critical knowledge of design, development, and sustainment to collaborate with industry partners in support of nuclear modernization.

SWS SUSTAINMENT ON *OHIO*-CLASS SSBN AND PROCUREMENT FOR *COLUMBIA*-CLASS SSBN

The 14 ship *Ohio*-class fleet remains the backbone of U.S. strategic deterrence, carrying approximately 70 percent of the U.S.'s New START Treaty-accountable deployed nuclear warheads in the form of the W76 and W88 families of warheads. Originally designed for a 30-year service life, the *Ohio*-class submarines were called upon to extend this service to 42 years, supporting a delay in investment in the next generation of SSBNs. To account for this extension in service life, SSP embarked on a life extension program for the Trident II D5 missile to update critical, aging missile electronics systems. SSP introduced the first Trident II D5 Life Extension (D5LE) program to the fleet in 2017 and the missile will remain an effective and credible SWS into the 2040's—supporting the *Ohio*-class submarine through end of service life and serving as the initial SWS for the *Columbia*- and UK *Dreadnought*-class SSBNs.

In parallel, SSP's program efforts and collaboration with the UK through the Polaris Sales Agreement, as amended (PSA) and Mutual Defense Agreement, as amended (MDA) support the UK's Continuous At Sea Deterrent through *Vanguard*-class SSBN end of service life and the transition to a *Dreadnought*-class SSBN fleet.

To meet these critical program responsibilities, SSP will sustain our deployed systems and modernize for our new ones, ensuring that we continue to keep the Navy's nuclear weapons safe and secure. We will develop and protect our logistics supply chain. Through these measures, SSP will continue to unlock new capabilities that the Warfighter can leverage to enhance strategic deterrence and act decisively should deterrence fail.

TRIDENT II D5 LIFE EXTENSION AND LIFE EXTENSION 2

The Trident II D5 Life Extension 2 (D5LE2) program is essential to maintaining a credible SBSD through the life of the *Columbia*-class SSBN. This program will:

- *Extend Service Life:* D5LE2 will replace the D5 and D5LE missiles to align with the *Columbia*-class, ensuring a credible at-sea deterrent for decades to come.
- *Enhance Capabilities:* Using a hybrid approach of leveraging existing reliable technology and integrating cutting-edge advancements, D5LE2 will have the flexibility to counter emerging threats throughout its life.
- *Strengthen the Industrial Base:* D5LE2 is a critical driver in revitalizing our domestic industrial base, ensuring the availability of critical components and supporting American jobs.

As the Navy carefully manages the approach to end of life of our *Ohio*-class SSBNs, we have assessed how we can ensure the SWS is available throughout the life of the *Columbia*-class SSBNs. A minimum of 12 *Columbia*-class SSBNs will replace today's 14 *Ohio*-class SSBNs, and beginning in fiscal year 2030, we will load current D5LE missiles on Hulls 1 through 8 of *Columbia*-class SSBNs. Production of additional D5LE missiles is not practical due to obsolete parts and the current lack of a robust industrial base.

To meet inventory requirements and maintain a credible strategic deterrent in the face of evolving threats, we will need to design, engineer, produce, and deploy D5LE2 in time for strategic outload of *Columbia* Hull 9. D5LE2 will be incorporated on all follow on *Columbia*-class Hulls and later on *Columbia*-class Hulls 1–8 during their Extended Refit Period from fiscal year 2039–49. D5LE2's architecture will ensure the weapon system maintains demonstrated performance and survivability while facing a dynamic threat environment driven by multiple nuclear challengers until *Columbia*-class end of life.

D5LE2 is a hybrid of existing, cost-effective technology (e.g., solid rocket motors, ignitors) and redesigned and updated components (e.g., avionics, guidance, system architecture); it is structured to maintain today's unmatched reliability and demonstrated performance while unlocking untapped system potential to efficiently respond to emerging needs and to maintain a credible SBSD.

INDUSTRIAL BASE AND INFRASTRUCTURE

The Nation requires a modernized nuclear force and supporting infrastructure to execute our national strategy. Unlike SLBM programs of the past, D5LE2 does not have the benefit of a healthy defense industrial base that was historically built on simultaneously maintaining production and continuous development. Our modernization needs cannot succeed without investing in research and development, the critical skills in the workforce, and the facilities needed to produce, sustain, and certify our nuclear systems. Ensuring robust defense and aerospace industrial base capabilities—such as radiation-hardened electronics, strategic inertial instrumentation, and solid rocket motors—remains an important priority in conjunction with research and development investment.

SSP has placed particular emphasis on the Solid Rocket Motor (SRM) industry and its sub-tier suppliers. We appreciate the support of Congress to allow for the continuous production of these vital components. Over the past 15 years, the SRM industrial base waned following the completion of the Space Shuttle missions, Minuteman III re-graining, and disruption of the space launch market by new Liquid Rocket Engine entrants. However, SRM demand is increasing due to competing programs (CPS, Sentinel, Next Generation Interceptor) and production rate increases for D5LE and D5LE2. In addition, the Trident II D5 SRM production line is aging and requires modernization in order to ensure production can continue well into the 2060's.

In short, full support of D5LE2 today is vital to achieving Initial Fleet Introduction in 2039 and to embarking on a path that maintains an SLBM deterrent capability through the service life of the *Columbia*-class SSBNs. If the Nation does not continue to address these concerns, no amount of money will be able to mitigate the risks realized if we do not adequately prepare our industrial base.

In addition to SRMs, we also need a national capability to build aeroshells, which protect the payload upon re-entry to the atmosphere. The Navy has not delivered an integrated aeroshell since the 1980's and needs to reinvigorate a production capability that only resides in a small cadre of highly skilled experts in an exceptionally niche industry. Aeroshell investment supports the Navy but will also be cost-effectively leveraged by our colleagues in the Air Force and our strategic partners in the United Kingdom as they pursue their independent warhead program endeavors.

The program's infrastructure is also at an inflection point, as existing facilities are reaching their 30-year recapitalization windows as we enter into a once-in-a-generation transition of both the weapons system and platform. The Navy relies on a limited footprint in Kings Bay, Georgia, Bangor, Washington, and Florida's Space Coast to process missiles and outfit the SSBNs. Maintaining and sustaining facilities is critical to meeting USSTRATCOM and Fleet mission requirements, as well as providing new capabilities through military construction. We will make smart investments to address capability gaps, throughput constraints, and design for surge capacity to address requirements presented by new and emerging threats. Our Nation and the Navy will continue to prioritize and resource the sustainment and modernization of its nuclear infrastructure enterprise to provide an effective and flexible deterrent now and into the future.

As the Navy executes the modernization and replacement of the SSBN and associated SLBM leg of the nuclear triad, DOD and the Department of Energy's (DOE) National Nuclear Security Administration's (NNSA) infrastructure must be prepared to respond in tandem to the evolving needs of the Nation. We must have an effective, resilient, and responsive plutonium pit production capability. This capability can address age-related risks, support planned refurbishments, as well as prepare for future uncertainty. Additionally, tritium, lithium, and uranium, and high explosives and energetics, among other strategic materials, are vital to ensuring the Navy can continue to meet its strategic deterrent requirements.

Efforts to sustain and modernize deterrent industrial base and infrastructure must continue. Our strategic forces underpin every military operation around the world, and we cannot afford to delay given the increasing threats facing our Nation.

WARHEAD AND REENTRY BODY ACTIVITIES

The Navy is also working in partnership with NNSA to refurbish our existing reentry systems and develop new reentry systems in response to USSTRATCOM requirements. As the threat environment faced by the nuclear enterprise continues to evolve, it is critical that the Navy designs, develops, and deploys programs that meet the needs of the Warfighter.

Today, the Trident II D5 missile is capable of carrying two types of warhead families, the W76 and the W88. SSP is designing and developing a new warhead system:

the W93 warhead and Mk7 reentry body system. It will be designed for use on both the D5LE and D5LE2 missiles and, through the PSA and MDA, and the Mk7 reentry body will support the UK's sovereign Replacement Warhead program.

W93/Mk7 will provide flexibility and adaptability to meet future Warfighter needs. With the near simultaneous age out of the deployed stockpile beginning in the 2040's, the W93/Mk7 will help address production concerns in the Nuclear Enterprise and ensure an uninterrupted at sea deterrent for the sea-based leg of the nuclear triad. In 2021, the Navy entered Phase 1 of the joint DOD-DOE Nuclear Weapons Lifecycle Process with NNSA for the W93. The Phase 1 effort addressed evolving ballistic missile warhead modernization requirements; improving operational effectiveness for USSTRATCOM; and mitigating technical, operational, and programmatic risk in the sea-based leg of the nuclear triad while simultaneously reinvigorating the atrophied industrial base. In fiscal year 2022, the W93 program received Nuclear Weapons Council (NWC) authorization to enter Phase 2, Feasibility Study and Design Options, which further refined and matured the design of the W93/Mk7 program in a manner that provides an affordable, credible, safe, and secure weapon to the Warfighter. This marked the first time a nuclear weapons program had reached Phase 2 since the W88 which ended production in the 1990's. As of March 2025, the W93/Mk7 program proceeded into Phase 2A. The W93/Mk7 will not increase the size of the deployed stockpile and will not require underground nuclear explosive testing. The Navy will work in close coordination with the DOD, NNSA, NWC, and Congress as this effort matures.

POLARIS SALES AGREEMENT (PSA) AND MUTUAL DEFENSE AGREEMENT (MDA): SUPPORT TO THE UNITED KINGDOM

Fundamental to U.S. strategic and extended deterrence policies is the special relationship between the U.S. and the UK through the 1958 MDA and the 1963 PSA. Under the PSA, the U.S. sells the Trident II SWS to the UK along with associated support, testing and training equipment, and defense services. This sales agreement allows the U.S. to procure the SWS, other equipment, and services for the UK on U.S. contracts under the same terms and conditions as those for the United States, allowing for increased economies of scale and sharing certain costs and liabilities.

In particular, certain SWS equipment, including missiles, are "mingled" in common asset pools. Although the U.S. maintains these mingled assets in the United States, the UK retains right to title for mingled assets in the United States, and the United States transfers title to the UK for deployment. The United States and the UK proportionately share costs and liabilities to maintain (and eventually dispose) of mingled assets throughout their lifecycles.

Under the MDA, the United States cooperates with the UK on the uses of atomic energy for mutual defense purposes. The PSA and MDA agreements are complementary, and together enable the U.S. Navy to sell SWS delivery system and reentry body equipment to the UK, as well as to exchange controlled unclassified and classified information, including atomic information, with the UK. This framework has ensured the U.S. ability to support the UK with strategic capabilities to ensure a robust, sovereign nuclear deterrent.

SSP's key responsibility associated with the *Columbia*-class program is the integration of the SWS onto the new SSBNs. A critical aspect is the Common Missile Compartment (CMC) that will support Trident II SWS deployment on *Columbia*-class SSBNs and the UK *Dreadnought*-class SSBNs. The CMC represents the most recent example of the PSA partnership, in which our nations established a cost-sharing arrangement to design, develop, and produce common shipboard infrastructure that improves comingling of Trident II D5 missile inventory and sets the stage to improve maintenance system consistency across the two fleets.

SSP also supports the SSBN Program Executive Office as it oversees U.S. industry's delivery of CMC components to both Navies for installation into their new SSBNs. Full lead ship construction is in progress along with delivery of SWS equipment to the UK in support of construction and outfitting efforts under the authorities of the 1963 PSA.

As with the *Columbia*-class SSBNs, the UK *Dreadnought*-class SSBNs will initially carry the Trident II D5LE missile. The development of the Mk7 reentry system to support the U.S. W93 warhead program is also critical to the UK's independent development of a next generation nuclear warhead and reentry system. Our nations are working separate and sovereign nuclear warhead programs that will leverage the Mk7 reentry system. SSP will continue to nurture and safeguard this special relationship with the UK as it contributes to ensuring peace through strength with the UK's Continuous At Sea Deterrent (CASD) today while modern-

izing and building flexibility, adaptability, and resiliency into the UK's future CASD.

SEA-LAUNCHED CRUISE MISSILE, NUCLEAR

Today, our deterrent force is challenged by adversaries' theater nuclear capabilities for which we have limited response options and against which we must invest now in capabilities to maintain deterrence for the future. In the fiscal year 2024 NDAA (Public Law 118–31), Congress directed establishment of a major defense acquisition program for SLCM-N. SLCM-N is a flexible, credible, and survivable sea-based regional deterrent capability designed to complement existing capabilities and to expand Presidential options.

In accordance with the fiscal year 2024 NDAA, Navy established a SLCM-N Program Office at SSP in March 2024. Over the past year, SSP has focused on standing up this program office and conducting the assessments needed to deliver a weapon system that meets Warfighter needs. The SLCM-N program is focused on achieving a milestone decision in fiscal year 2026 and continuing program assessments to buy down technical and programmatic risk. Executing this program requires careful balancing of resources to ensure existing critical Navy programs of record are not adversely impacted.

Fiscal year 2024 Research, Development, Test & Evaluation funding enabled the program to begin building the technical understanding and programmatic underpinnings in support of a SLCM-N capability delivery by fiscal year 2034. Over the last year, the SLCM-N program has focused on understanding and determining the Weapon System's architectures. SLCM-N development will span the missile system, fire control, launcher system, platform integration, and warhead system integration as well as development of applicable support equipment, telemetry and flight test hardware, ashore infrastructure, and training material. The program office has focused efforts on defining the system architecture that integrates these elements, conducting systems engineering analysis to inform key Materiel Solution Analysis (MSA) decisions, and establishing the acquisition framework that will enable successful program execution.

The program has conducted assessments of early candidate airframe options to understand the key technical challenges unique to developing SLCM-N. Challenges identified include integration of a nuclear warhead into a conventionally armed cruise missile design while meeting nuclear surety requirements and marinizing a missile not originally designed for underwater launch. In addition to these initial technical assessments, the program researched potential alternate airframe and component vendor options to understand the missile options that may best meet requirements and provide the best path to Initial Operating Capability (IOC) by fiscal year 2034. Beyond SLCM-N airframe considerations, the Navy, in cooperation with NNSA, has worked to assess available warhead options for selection of a warhead that meets requirements.

The program has been equally focused on the integration of SLCM-N into the *Virginia*-class submarine. As the SLCM-N shipboard architecture matures, preliminary platform interfaces are being established, shipboard environments defined, and fire control solutions that meet nuclear surety requirements assessed. Over the last year, the SLCM-N program has conducted numerous programmatic and engineering assessments to help define and narrow the shipboard integration trade space and enable MSA engineering decisions. The SLCM-N weapon system is being designed and integrated with the intent to minimize impact to *Virginia*-class readiness and operations.

In parallel with efforts to develop the missile system and integrate it into the submarine, the program is working to develop the supporting infrastructure needed to store, maintain, and deploy SLCM-N. The weapon will be stored and loaded at the Strategic Weapon Facilities (SWF) already used for the Trident II D5 SWS and will leverage a combination of existing, modified, and new facilities at the SWFs. Early studies are focused on developing a plan for the SWFs that supports SLCM-N requirements while ensuring SWS programs of record are not impacted.

The Navy is moving rapidly to complete the activities needed for a successful milestone decision in fiscal year 2026. Consistent funding resources are critical to the program's ability to deliver a system with an IOC by fiscal year 2034. The ability to find and rapidly scale the workforce that will develop SLCM-N is critical to mission success.

WORKFORCE

SSP's mission—strategic deterrence—is critical to this Nation. It is the foundation of the Interim National Defense Strategic Guidance and is the top priority of the

Secretary of Defense. Based on the success of the Trident program, SSP has also been tasked with rapidly developing and producing the Navy's first hypersonic weapon system, CPS, along with the Army's long range hypersonic weapons system. At the same time, SSP is currently developing the SLCM-N. This is a new capability that required the organization to establish a new program office, along with corresponding staff. Finally, I have Echelon I command responsibilities for the personnel that execute regulatory oversight of the Navy Nuclear Deterrence Mission and technical authority on Department of the Navy Nuclear Weapons and Nuclear Weapons systems, effort that provides a holistic Navy view of the no-fail mission.

Because of our demonstrated success, and the importance of these new programs, SSP's workforce has been growing and requires continued growth. SSP must recruit, train, and retain some of the most sought-after skills in the U.S. job market to support the breadth and complexity of SSP's strategic deterrence mission. SSP requires a workforce comprised of highly specialized, technical experts. Failing to appropriately staff this command would be catastrophic to the Navy's Fleet Ballistic Missile program, the Conventional Prompt Strike program and the Sea-Launched Cruise Missile—Nuclear program.

History reminds us that the swift, successful creation and execution of the Fleet Ballistic Missile program in the 1950's was truly a result of national commitment, congressional support, and a cadre of hand-selected scientists, engineers, and inspirational leaders. Though process will always underpin our efforts, our dedicated predecessors—civilians, military, and industry partners alike—responded to the national need with focused determination and propelled the program forward with a vision. People are as fundamental to our nuclear deterrent as the SWS itself. Today, SSP and its industry partners are focused on inspiring, growing, and retaining a generation of workforce that did not live through the darkest days of the cold war. Connecting a new workforce to this fundamental global security mission remains an important task shared among the entire nuclear enterprise.

Our mission has grown significantly, while our workforce size has not grown in the same proportion. Additionally, as the global threat environment has changed and the operational tempo has increased, the workforce is challenged to manage the increased strain on an already aging deployed weapons system. In order to accomplish SSP's sustainment and development missions, SSP must have trained, skilled employees on-board and able to work independently.

The next decade is a time of great importance to successfully accomplish concurrent development efforts, on top of the sustainment of the aging D5/D5LE weapon system. SSP has spent the past several years posturing its workforce, organizational structure, infrastructure, culture, and technical capabilities to ensure optimal success for the impending bow wave of critical development, testing, deployment, and sustainment.

CONCLUSION

Since the 1950's, our Nation's sea-based strategic deterrent has been a critical component of our national security and must continue to assure our allies and partners and deter potential adversaries well into the future. SSP ensures a safe, secure, effective, flexible, and strategic deterrent, with a steadfast focus on the proper stewardship, custody, and accountability of the nuclear assets entrusted to the Navy. Sustaining and modernizing the sea-based strategic deterrent capability is a vital national security requirement.

As the fourteenth Director at SSP, I have absolute faith and confidence in the safety, security, effectiveness, and credibility of our Navy's strategic deterrent due to the proficiency and professionalism of the dedicated service members and civilians committed to our mission. With continued congressional support and stable, on-time funding, the Navy will continue to effectively defend our Nation and preserve peace for future generations.

Senator FISCHER. Thank you, Admiral. We will begin our first round of questions. Five-minute questions please. Admiral Wolfe, I've appreciated our discussions on standing up the SLCM-N. Can you update the Committee on the progress that the Navy's made on that?

Admiral WOLFE. Yes, ma'am. Thank you for the question. Yes, as I've said, we stood up our program office, we started to look at what——

Senator FISCHER. Do you found that to be helpful?

Admiral WOLFE. What to be helpful, ma'am?

Senator FISCHER. That you've got the office stood up.

Admiral WOLFE. Yes, ma'am. Absolutely. What that is a lot——

Senator FISCHER. Was that faster than you anticipated?

Admiral WOLFE. Excuse me, ma'am?

Senator FISCHER. Was it quicker than you anticipated?

Admiral WOLFE. I wouldn't say it was quicker than anticipated. We're still trying to ramp up to get the right number of folks, but what that small group of people, since we've stood that up, has been able to do in the last year, we've been able to focus on what are the things that we need to do to get to meeting the requirement of 2034, but as importantly, it's allowed us to work with NNSA in partnership to select a family of warheads.

It's allowed us to pulse industry and start to get ideas and new ways of thinking into this system, so that we can continue to meet all of the requirements. We've really started to hone in on what are those concepts and how are we going to integrate this system onto a platform that was never built to carry nuclear weapons.

We've had many discussions with this Committee in the past about how we're going to do that, and in the last years we've worked with the fleet, we've also been able to get their ideas to understand exactly how we can go about this without impacting the larger SSN mission.

Senator FISCHER. You have a 2034 timeline, what's the greatest risk to that, do you think?

Admiral WOLFE. I think the greatest risk to the 2034 timeline again, is it goes back to that it's really understanding how are we going to get this system integrated into a platform that was never purpose built for that. It's also to be able to do that in a way so that we don't deter from the primary SSN mission. This will be a whole new infrastructure that we have to stand up. Getting all of those things in place, getting the weapons system done, but as importantly, getting the fleet trained, getting all the things that we need to do, that's going to be one of the challenging parts of this.

Senator FISCHER. Thank you. Mr. Hoagland, can you provide an update on NNSA's progress on the future warhead for SLCM-N?

Mr. HOAGLAND. Yes, Senator. Thank you. Paralleling Admiral Wolfe's comments, we stood up a program office last summer. Among the first responsibilities of that office. They ran a very disciplined warhead selection process using over 30 metrics to grade and rank the suitable warheads for options. We have selected and identified the W 80 family of warheads as most suitable for this purpose, that this allows us to stay ahead of the interface documents that we'll be pursuing the engineering required and emphasis on staying very coupled to the Navy during development with the platform into which that warhead will go.

Senator FISCHER. Thank you. I appreciate the thoughtful work that both NNSA and the Navy along with U.S. Strategic Command (STRATCOM) and the combatant commanders are doing to assess the best way forward for this program. I appreciate the close communication with this Subcommittee as design choices are considered. So, thank you for that.

General Bussiere, the Air Force is responsible for many of the components that comprise our NC3 system, including delivering

the new Survivable Airborne Operations Center (SAOC) aircraft. Can you provide us with an update on that program?

General BUSSIERE. So, Madam Chair, of the Survivable Airborne Operations Center, the 747–8is that will replace the——

Senator FISCHER. Oh, mic?

General BUSSIERE. Yes, it is.

Senator FISCHER. Can you get a little closer?

General BUSSIERE. Yes.

Senator FISCHER. Thank you.

General BUSSIERE. So, the SAOC weapon system that's going to replace the existing E–4B National Airborne Operations Center is fairly nascent in its execution from the contract award last year but going very well. So the primary contractor has built facilities in Ohio and they purchased the original or the initial buy of 7478is, and they're going through initial processes of it.

We're also outlining the military construction to outfit off Air Force base and I think most members of the Committee are aware that we stood up the 95th Wing to take host of that capability as well as others in that portfolio.

Senator FISCHER. What can you share about the 95th wing that was stood up? What are the operations of the unit? How are they progressing it off it?

General BUSSIERE. So, they're literally, we just stood it up a few months ago. Colonel Leaumont is the first commander as most Committee Members are aware. He was the five 95th command and control group commander, which is the group that previously had the NAOC mission. He's standing up his command team outfitting his organization and we're giving him the resources to pull together.

I think most committee members are aware, when I first wanted to stand up this wing, it was bringing together both Active Duty, Guard, Reserve elements in the, in the in the realm of communications and control in our special space into the leadership oversight of one commander. We're very pleased with its progress so far.

Senator FISCHER. Good to hear. Thank you. Senator King.

Senator KING. Thank you. Admiral Wolfe, you used a term I've never heard before, stable on time funding. What does that mean?

[Laughter.]

Senator KING. Let's hope that we can make that happen. That's certainly the goal, and I understand how debilitating it is to not have stable on time funding.

Dr. Vann, I just understand that you're leaving Federal service shortly after 15 distinguished years, and I just wanted to congratulate you and thank you for your extraordinary service to the country. Let me start with a question for you Dr. Vann. The prior organization that preceded where you are now included chemical and biological defense and threat reduction. I don't think that's in the new job description. Where has that gone? Is that still being attended to somewhere?

Dr. VANN No, so it actually is still a part of the implementation plan of the nuclear deterrent and chem/bio defense policy and programs. So, it will be all pulled together into an organization.

Senator KING. It's going to stay in the current, the new organization?

Dr. VANN That is the hope and the current plan based off of the legislation.

Senator KING. Mr. Hoagland, if you were listening to the first panel, you won't be surprised by this question. You mentioned the phrase, "the foundation is our workforce." How is your workforce? Do you have sufficient workforce? Did you have to go through rifts and fork-in-the-road and people leaving? Where are you compared with where the organization was in terms of staffing on January 1st of this year?

Mr. HOAGLAND. Thank you, Senator King. We did recover. We have brought back all the terminated employees that were lost in February. The people I speak to and work with in NNSA, in particular in the weapons activities portfolio, are here for the mission. They're motivated by the mission. They recognize the multigenerational inflection point we're experiencing in the nuclear deterrent, and they're laser focused, and they're delivering with some losses from the deferred resignation program.

We undertook a process to identify critical needs, either from those absences or because of emergent requirements in the program, and we've shifted staff around to attend to the most important needs, and we continue to deliver.

Senator KING. Well, one of my questions is, is the hiring freeze still in effect?

Mr. HOAGLAND. By and large, the hiring freeze is still in effect.

Senator KING. Well, that's what worries me is with people are taking deferred whatever you call it, fork in the road retirement, and the hiring freeze is in effect, you end up with, could end up with some pretty important vacancies.

Mr. HOAGLAND. That's very true. With the Secretary's support, we have exempted the hiring freeze for the Office of Secure Transportation. We're very pleased to note that we've been able to offer job opportunities and we are starting a new class for Office of Secure Transportation this month to continue the pipeline into that particular mission space.

Senator KING. Thank you. General Bussiere, good to see you again.

General BUSSIERE. Same here, Senator.

Senator KING. Thank you for the service that you're providing. We had some discussion in the Armed Services Committee this morning about Air Force availability. Do you have a figure for availability of your strike force? In other words—well, you know what I mean. What's the percentage of your force that's available at any given moment?

General BUSSIERE. From a bomber perspective, Senator?

Senator KING. Correct.

General BUSSIERE. So, between the B1, B2, and B52 force, we hover around the fifties for aircraft availability just because of spare parts and the legacy weapon system sustainment.

Senator KING. In terms of spare parts, one of the things the committee is looking at is when we are acquiring new platforms that we also acquire the intellectual property so that we can make our own spare parts. I believe there should be a 3D printer in every depot and on every naval ship. Right now, is spare parts a bottleneck for you? Because to be honest, 50 percent availability the com-

mercial aircraft is 98 percent availability. They'd be long out of business if they had a 50 percent availability.

General BUSSIERE. It's not necessarily unique to the bomber fleet, it's just it's——

Senator KING. No, I understand that. That was the number we had this morning for the Air Force generally.

General BUSSIERE. The bomber fleet is challenged by what we call is legacy vendors that don't actually make the parts we need. So that's a challenge for the acquisition community to get those contracts put on order. As you know, the B52 is——

Senator KING. Pretty old.

General BUSSIERE.—70 years plus old. The B2 is in its thirties, the B1 is in its forties and fifties, depending on the year the aircraft was made, and we're using them a lot. So the demand signal for our bombers is at the highest level that I've seen it in my career. While we're also challenged to get the sustainment parts on the shelf for the legacy.

Senator KING. I hope that could be a priority in terms of sustainment and maintenance and maintaining a higher level of availability that's a better deal for the taxpayers and it makes sure service all the more lethal if it's available

General BUSSIERE. Without a doubt, and that's obviously the reason why we're going to be fielding the B21 Raider platform to replace the B1 and the B2 is because of the age and the legacy fleet and modernizing the B52 H to the B52 J model.

Senator KING. Thank you. Thank you, Madam Chair.

Senator FISCHER. Thank you, Senator King. Senator Rounds.

Senator ROUNDS. Thank you, Madam Chair. Once again, thank you all for your service to our country. General Bussiere, the B21 program is critical to the future bomber leg of the triad. Based on what you know of the current and projected demand commensurate to a great power competition paradigm with two near peer nuclear adversaries, how many B21s do you believe would be optimally needed to support U.S. war plans and deterrence?

What do you think the key drivers are going to be with regard to managing the procurement and sustainment right now, based on what you're seeing and recognizing that, I think there's a lot of us would like to see these B21s come on at a higher rate than what they're currently planned for, but this is probably one of the best examples of a system which is working. It's on time, it's on budget.

Can you share with us a little bit about what you think the needs are for this particular platform?

General BUSSIERE. Yes, Senator Rounds, very pleased with the progress so far. The B21 Raider platform. As the committee is aware, we've had first flight, we have one aircraft, T-One is in testing, developmental testing out at Edwards Air Force Base, and we have a classified number on the production line. Ellsworth Air Force Base is the first installation, we'll field the B21, and our construction projects to bed down that weapon system are going very well also, as well as the repair of the runway to field that capability.

As the Committee is aware, the program of record currently is at least 100. The Air Force back in 2018 and 1919, I believe testified before Congress that the right number at that time potentially

could be as high as 145. I understand General Cotton testified to that effect this year. I support assessing the increase of the production from 100 to 145. But I think the real question for the department and for the Nation is what's the right mix of long-range strike platforms versus other strike platforms?

It's a reasonable question the Nation has asked several times in the last year or two, and that there are ongoing efforts, I believe, both on the Hill and in the Department of Defense to assess what the correct number of long-range strike platforms are in the Department of the Air Force.

Senator ROUNDS. I think part of that also goes back to what exactly will the threat be. Part of what we're asking to be developed based on the NDAA last year was a study anyway as to how we handle two different theaters at the same time. Because there's a general consensus out there that if we're going to have a significant problem with one of our near peer adversaries in one theater, very high probability that we'd have a similar threat develop in a second theater. Thus, putting the demand out there to be able to respond in both locations with appropriate platforms.

I'm going to come over to Dr. Vann for just a second. Can you share a little bit about the direction that you see the approach taking? I know that you know, either we talk about a new defense strategy we look at revising somehow our current one. Can you share with us a little bit about the, the direction that you see in terms of our strategic response and what we can expect from the Administration?

Dr. VANN Sure. Yes, sir. Secretary Hegseth, of course, approved an interim National Defense Strategic Guidance classified document, which really goes into some details about how the DOD is going to implement President Trump's peace through strength kind of agenda. In there, there was some discussion about the prioritizing, planning, resourcing decisions that will be kind of entered into with a full National Defense Strategy (NPS).

As you know, the NDS requires a review of our force size, shape, posture considerations, and all of the detailed prioritization of the threats, missions, and major investments. We do anticipate an in-depth look in the NDS on our nuclear strategy and our posture, especially in this kind of new geopolitical environment. I would anticipate broadly nuclear strategy and posture will be leveraging the work of things like the Strategic Posture Commission's analysis, as well as some of the updated information that we have about the geopolitical threat environment.

Senator ROUNDS. Do you have a timeline?

Dr. VANN Sir, it is just begun and it is just underway. Our policy colleagues are working on pulling that together as we speak.

Senator ROUNDS. Thank you. Thank you, Madam Chair.

Senator FISCHER. Thank you, Senator. Senator Kelly.

Senator KELLY. Thank you, Madam Chair. Admiral Wolfe, I want to come back to the SLCM-N discussion. So you talked about you stood up the program office, you are in the process of looking through a family of warheads to figure out what the warhead would be a pulsed industry. You've been working with the fleet and you talked about how to integrate this needed platform on a platform that wasn't designed for a nuclear weapon.

You mentioned that we can't deter, and I think I wrote this down as a quote, "We can't deter from the primary SSN mission." The primary *Virginia*-class submarine attack, conventional attack mission. And that's my big concern here.

Admiral WOLFE. Yes, sir.

Senator KELLY. So, explain to me how do we do that and how do we integrate a nuclear weapon into a *Virginia*-class sub without impacting training, mission systems, security? I assume we're going to have to have marines on board. Usually with nuclear weapons, we provide a contingent, unless that is a decision that does not apply in this case, we've got to store these weapons.

So, my assumption, and I might be wrong, we would carry fewer torpedoes. This could possibly change the ops tempo of the submarine, because now we have different systems that we have to maintain that are additional systems. We're going to be limited in the ports we can go in, so maybe even maintenance overseas and resupply could be impacted. I assume there's going to be additional operator positions for the nuclear enterprise on board. So what positions are we going to take away?

So, if you can go into a little bit about that and then come back to how this doesn't deter from the primary conventional mission.

Admiral WOLFE. Yes, sir. So, acknowledge all your concerns we've talked about those in the past. So those are all the things as we work with the fleet, we are looking at what are the ways that we can architect the system to be able to do just what you said. Certainly there's going to be—I would tell you there's not going to be zero impact, but as we've worked with the fleet, what we believe is, we can come up with the right concepts of how do I train a crew that can deploy with this weapon to do the things that it needs to do that doesn't require the rest of the crew doing the missions they would normally do.

Senator KELLY. Where do these people sleep?

Admiral WOLFE. So, we're going to work through that, sir. It's not going to take a large number of folks once you get that weapon on board. Just to address your, your concern about marines in a submarine environment, we don't need marines. We don't need that type. We know how to do that in different ways. It's what we do on our Ship, Submersible, Ballistic, Nuclear (SSBN)s today. So we're going to take the best of all of those, and we're going to figure out how we do that and integrate that with a very small number of additional folks. I can tell you, having done this a long time, it will be a small number of folks that actually have to operate that particular system, which will be different than all of the other systems that are on board, so.

Senator KELLY. Madam Chair, let me be clear here. Here's my concern. I understand we're going to try to do the best job we can at this, but we have an incredibly capable platform in the *Virginia*-class submarine.

Admiral WOLFE. We still will.

Senator KELLY. Well, we do now, and it's a conventional platform——

Admiral WOLFE. Yes, sir.

Senator KELLY.—that the Chinese and the Russians pretty much, but definitely the Chinese cannot compete with. I'm con-

cerned we come out of this and the likelihood that we have to use the conventional part of this, of a Virginia class submarine and a conflict with China is rather high, if we got into a conflict. The probability that we would use the nuclear systems aboard this submarine are actually rather low. So, we're going to sacrifice the exquisite capability of this platform, and it's going to become a little less capable. I don't know how less capable. My concern is it could be significant.

My other concern is, we've set $2 billion aside for the development of this. Congressional Budget Office (CBO) estimates, the cost of SLCM-N and its war add at $10 billion between 2023 and 2032 if the program began in 2024. That amount does not cover pro production costs beyond 2032, nor does it include any of the costs for integrating the weapon system into the submarines, which I think is going to be substantial. I mean, we're talking about billions of dollars.

Then we have the additional costs beyond that of, you know, security and operations and weapon storage costs. So, I don't think this thing has been fully thought out, but again, my biggest concern about this, and I am not against having another tactical nuclear option, I just think that the costs not only the financial costs, but the cost to the conventional submarine fleet, in my view, is too high.

I come from the aviation background, so it's kind of hard for me to say that I think our conventional submarine force is unmatched anywhere in the world. And it is something where we have this substantial overmatch with the Chinese and I feel we're putting it at risk. Thank you.

Senator FISCHER. Thank you, Senator Kelly. General Bussiere, I urge you to work closely with Secretary Meink and also to be able to reach that next milestone that we have with Sentinel. The longer we delay the decisions, the more budget uncertainty that program's going to face. It's been determined that that is a program that is priority and that this country needs. Can you please describe the risks that we may incur if Sentinel is not adequately funded in fiscal year 2026 budget?

General BUSSIERE. So, Madam Chair, I look forward to the opportunity for our new Secretary of the Air Force Secretary Meink to come visit Barksdale and get a complete update on all our—at least two thirds of the Nation's nuclear triad from Air Force Global Strike Command. As it relates to the Sentinel Weapon System, I've said in several public forms that this July will be the 55th anniversary of fielding the Minuteman III capability, the 91st Missile Wing in Minot, North Dakota. 55 years ago.

So, the time for recapitalizing, the land leg of the triad, quite frankly, was probably a decade or two decades ago. But here we are today in 2025 and we're restructuring the Sentinel Weapon System to be able to field that capability at a very stressed time in our Nation's history. I agree with the committee's position that the Sentinel Weapon system needs to be funded sufficiently to get that program back on track and field it as expeditiously as we can as a department. I'm confident that our secretary will have the same position.

Senator FISCHER. Thank you, General. Admiral Wolfe, can you provide an update on the Trident II D5 Life Extension 2 (D5LE2) and the impact of the recent contract modification that took place?

Admiral WOLFE. Yes, ma'am. So D5LE2, as you know, is the replacement for the current system that we have. We've just come through a recent review to know that we're starting to understand the exact requirements, which dovetail from what we actually have today. So we've come through that. That program is on schedule it's on track and certainly the contract modifications were to continue down that path so that we can eventually get into our preliminary design review, our critical design review with the goal of, right now the plan is to start flight testing of that system in 2033.

We're challenging the team to pull that to the left to get early learning. It's things we've gotten, what we've learned in other programs, like hyper sonics, get that testing done as quickly as you can. So the modifications you're referring to are to start us down that path and get industry ramped up to continue that development effort.

Senator FISCHER. What do you see as the biggest threat to being able to execute those timelines?

Admiral WOLFE. Yes, ma'am. It's kind of what I said in my opening testimony. I think our biggest, I wouldn't say threat, but the thing we're going to watch closely is how we ramp industry back up in all of these modernization programs. Not this one, but, you know, things like Rad-hard electronics, solid rocket motors, all of those things which are very small, industrial based. Again, with and as we're all trying to do this at the same time, making sure we've got the industrial capacity and capability to meet all of our program needs to keep them on track.

Senator FISCHER. Okay. Thank you. Senator King, other questions?

Senator KING. Just a couple. Admiral Wolfe, you're working with the British on the W 93. How is that collaboration going?

Admiral WOLFE. Yes, sir. So I would tell you both programs, they're being done in parallel. Obviously, the UK design is a sovereign design, but as we work in parallel both us and NNSA under the Mutual Defense Agreement, I think we have gotten to the point where both teams are moving forward in parallel, the right amount of data is being shared where it needs to be shared. I would say the way that we're all three of our organizations are working together is, is really good right now.

Senator KING. Final question, General Bussiere, how are you doing on retaining pilots? That's been a problem with the fighter pilots. Is it a similar problem with bomber pilots or is that a different breed of cat?

General BUSSIERE. No, our rated management stressors are pretty agnostic of the platform. So, we're experiencing similar challenges in retaining. You know, historically when the airlines are hiring, we have a retention problem, and when they're not hiring, we don't. There's different dynamics that affect a aviator's decision to stay in the Air Force. But we have similar challenges in Air Force Global Strike Command.

Senator KING. A couple of years ago Senator Cotton and I had what amounted to a focus group with Young Air Force pilots with-

out the brass around. To sort of get from them some information about their view of the retention issues and the pilot shortage issues. It was very interesting. We expected going into that meeting, it was going to be all about bonuses and quality of life and housing and all those kinds of things.

What they shared with us almost universally was they want to fly. What was pushing them toward the door were desk assignments. These were people that joined the military and they don't necessarily want to be a General, they want to fly airplanes. I thought that was a very interesting insight that came across to Tom Cotton and I very strongly, and I just commend that to you for your thinking in terms of retention.

General BUSSIERE. Senator King, that's a universal aspect of retention for aviators in the Department of the Air Force. Across the board the department is aggressively trying to come up with not only new ways for generating aviators through our pilot pipeline, but also coming up with programs to convince our aviators of staying in service to their nation in the Air Force.

Senator KING. Well, one way may be to have parallel tracks. You're on the pilot track or you're on the officer track, and it may be that some people choose to stay with flying as opposed to moving up in the ranks. But I just wanted to share that with you because the impression came through so dramatically to us that this was one of the principle issues. So, I just, again, wanted to share that insight.

General BUSSIERE. Absolutely, Senator.

Senator KING. Thank you. Thank you, Madam Chair.

Senator FISCHER. Thank you, Senator King. Thank you to our panel members today. Appreciate you being here and providing us with important information. With that, the hearing is adjourned.

[Whereupon, at 6:07 p.m., the Subcommittee adjourned.]

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR TOM COTTON

NUCLEAR ARMED SEA-LAUNCHED CRUISE MISSILE

1. Senator COTTON. Vice Admiral Wolfe, is there a need for Nuclear Armed Sea-Launched Cruise Missile (SLCM-N) or a variant to field prior to 2034?

Vice Admiral WOLFE. Our deterrent forces are challenged by U.S. adversaries' theater nuclear capabilities, for which we have limited response options. SLCM-N is a theater nuclear system intended to expand the President's options for responding to limited nuclear use and strategic, non-nuclear attacks. The Navy is executing the SLCM-N program to meet the requirement established by the National Defense Authorization Act (NDAA) of fiscal year 2024, as amended, to achieve a SLCM-N initial operational capability (IOC) by September 30, 2034.

2. Senator COTTON. Vice Admiral Wolfe, what is driving that need for an earlier SLCM-N variant to field prior to 2034?

Vice Admiral WOLFE. The Navy's SLCM-N program is executing to meet the Fiscal Year 2024 NDAA's requirement, as amended, to achieve IOC by September 30, 2034. The program is working to effectively deliver the required capability as soon as feasibly achievable.

3. Senator COTTON. Vice Admiral Wolfe, you stated that SLCM-N fielding by 2034 was on a "very, very aggressive timeline". Is the SLCM-N program still on track to reach initial operating capability (IOC) by 2034?

Vice Admiral WOLFE. The SLCM-N program is executing to a schedule based on the Fiscal Year 2024 NDAA requirement, as amended, to reach IOC by September

30, 2034 and the program is on track to meet that schedule. The program's next major programmatic event is Milestone A in fiscal year 2026, with Milestone B anticipated to occur in fiscal year 2029 and Milestone C anticipated in fiscal year 2032.

4. Senator COTTON. Vice Admiral Wolfe, has the Navy given you a requirement to demonstrate a SLCM-N capability earlier than IOC?

Vice Admiral WOLFE. The Navy is executing the SLCM-N program to the congressionally mandated requirement to achieve IOC by September 30, 2034. The Navy has not levied a requirement to demonstrate a SLCM-N capability earlier than the Fiscal Year 2024 NDAA requirement.

5. Senator COTTON. Vice Admiral Wolfe, will the Navy fiscal year 2026 budget request include early submarine platform funding to make a submarine available sooner than required for IOC?

Vice Admiral WOLFE. The Navy's fiscal year 2026 budget supports the SLCM-N program's approach to submarine platform integration, including funding that will be used to 1) develop and produce a prototype nuclear fire control subsystem, 2) conduct submarine platform systems modifications, and 3) begin development of SLCM-N engagement and mission planning systems.

6. Senator COTTON. Vice Admiral Wolfe, will the Navy fiscal year 2026 budget request for SLCM-N include the budget to develop an additional missile sooner than the missile required for IOC?

Vice Admiral WOLFE. The Navy's fiscal year 2026 budget supports the program's approach to competitively design and prototype multiple missile airframe options. The budget will be used to procure hardware for early developmental testing, including early prototyping, ground testing, and long-lead components for early flight testing.

7. Senator COTTON. Vice Admiral Wolfe, has the Navy proposed any legislative recommendations to Congress to allow for an earlier SLCM-N deployment option?

Vice Admiral WOLFE. The Navy has not proposed any legislative recommendations to Congress to alter the Fiscal Year 2024 NDAA requirement to achieve SLCM-N IOC by 2034.

8. Senator COTTON. Vice Admiral Wolfe, for any alternative, earlier systems being pursued, does this take resources from, or add any risks to the original SLCM-N system?

Vice Admiral WOLFE. The DOD is committed to funding the SLCM-N program to deploy a capability that meets program requirements to achieve IOC by September 30, 2034. Any options to accelerate delivery of a SLCM-N capability earlier than fiscal year 2034 will require additional consideration.

9. Senator COTTON. Mr. Hoagland, the National Nuclear Security Administration (NNSA) established a Federal Program Office for SLCM-N in July 2024. What progress has been made on the SLCM-N program since July?

Mr. HOAGLAND. Since establishing a Federal program office for SLCM-N in July 2024, NNSA has made significant progress on this program. This includes developing selection criteria for the SLCM-N warhead, down-selecting the warhead type in concert with the Navy, and establishing a milestone-based schedule for development, testing, and production of the weapon. NNSA continues to coordinate with DOD/Navy partners as missile options are evaluated.

SENTINEL

10. Senator COTTON. Dr. Vann, what is the expected operational capability date for Sentinel?

Dr. VANN. *Mr. Drew Walter, Performing the Duties of the Assistant Secretary of Defense for Nuclear Deterrence, Chemical, and Biological Defense Policy and Programs, responded to questions on behalf of Dr. Vann.* Pursuant to Executive Order (EO) 14265, Modernizing Defense Acquisitions and Spurring Innovation in the Defense Industrial Base (April 9, 2025), the Department of Defense is conducting a review of Major Defense Acquisition Programs (MDAP), and the Sentinel Program is being reviewed as part of that effort. In parallel, the Sentinel program continues its restructuring efforts, as required after the Nunn-McCurdy certification, and has not yet reached a new Milestone B approval. The expected initial operational capability will not be known until the restructuring is complete and the program is approved for a new Milestone B.

11. Senator COTTON. Dr. Vann, how do you assess the risk of strategic deterrent requirements caused by current delays to the Sentinel program?

Dr. VANN. *Mr. Walter responded to questions on behalf of Dr. Vann.* U.S. nuclear forces remain sized and postured to support deterrence objectives identified for the nuclear triad. Current projected delays of Sentinel re-emphasize the importance of the Minuteman III (MMIII) Intercontinental Ballistic Missile system. My team and I will continue to work with General Bussiere and the Air Force to ensure MMIII remains a safe, secure, viable, and effective facet of the nuclear triad as long as it remains in the field.

The programmatic risk of a delayed fielding of Sentinel remains under evaluation, and I remain confident in the U.S. nuclear deterrent's ability to meet all objectives.

ENRICHED URANIUM RESUPPLY

12. Senator COTTON. Admiral Houston, what is the most specific date you can provide for when the NNSA will need a new supply of enriched uranium to meet national security needs?

Admiral HOUSTON. The amount of HEU currently allocated from the existing Department of Energy (DOE) stockpile for Naval Reactors' use is projected to last until the 2050's under the previous administration's shipbuilding plan. Pending no major changes to either future shipbuilding plans or to current HEU allocations, NNSA's current schedule to have new HEU enrichment capabilities operating before 2050 will support uninterrupted Navy nuclear shipbuilding, inclusive of the United States' commitment to deliver nuclear-powered submarines under AUKUS. Any acceleration in shipbuilding plans or reallocation of stockpiled HEU away from Naval Reactors will drive an earlier enrichment need.

13. Senator COTTON. Admiral Houston, do you believe that the NNSA's domestic uranium enrichment program can meet that date?

Admiral HOUSTON. NNSA's program has so far met initial milestones for testing and deployment of new enrichment capability, and my team is following and supporting these efforts. To augment these efforts and maximize margin to the Navy's need, my team is also engaged in DOE's efforts to implement the President's Executive Order on Reinvigorating the Nuclear Industrial Base, which includes actions to ensure a domestic nuclear fuel cycle sufficient to meet civilian and defense needs, if necessary.

14. Senator COTTON. Mr. McConnell, given the growing nuclear threats, do you think 80 plutonium pits per year will be enough to meet deterrence requirements?

Mr. MCCONNELL. NNSA has committed to producing no fewer than 80 plutonium pits per year as soon economically and technically possible, with the goal of re-establishing the capability for steady-State rate production of plutonium pits on the timelines required to meet DOD requirements.

RAPID ACQUISITION

15. Senator COTTON. Mr. McConnell, the NNSA's acquisition cycle to modernize the weapons in our stockpile can take around 20 years. Do you think there's a role for a rapid acquisition effort in the NNSA that is dedicated to delivering capabilities faster by tailoring requirements and prioritizing speed?

Mr. MCCONNELL. NNSA is currently executing seven nuclear modernization programs in the program of record while sustaining the existing stockpile and recapitalizing the enterprise's industrial base. Major modernization efforts often take at least a decade.

The evolving global security environment requires the nuclear security enterprise, in coordination with DOD, to rapidly demonstrate and potentially deploy new nuclear weapons with novel characteristics. The enterprise is developing weapon concepts that fill emerging deterrence gaps, producing systems at "the speed-of-need" while minimizing impacts to the ongoing Program of Record (PoR).

NNSA believes the fastest and most efficient path to the rapid demonstration of novel capabilities is through the use of existing programmatic authorities. Today, NNSA is rapidly demonstrating capabilities on a small scale through initiatives such as the Stockpile Responsiveness Program (SRP). NNSA is modestly reorganizing this program within the Office of Research, Development, Test, and Evaluation (RDT&E) to accelerate execution. NNSA's Office of Stockpile Modernization is also streamlining execution where possible to field new weapons with service engagement and authorized acquisition programs; however, the office does not need any additional programmatic authorities. The B61–13 is the most recent example of rapidly fielding a new capability.

Within current programmatic lines, NNSA is chartering a Nuclear Deterrence Rapid Capability Team (ND RCT) to streamline oversight and execution of rapid capability demonstration activities. ND RCT will integrate efforts across several subprograms to support up to three simultaneous projects that address identified capability gaps. As ND RCT executes these projects, it will identify opportunities and future activities necessary for full system development, production, and accelerated fielding, as directed.

16. Senator COTTON. Mr. McConnell, should we use the approach used in W76–2 and the B61–13 programs, which delivered new capability in years, not decades, to address some of our near-term deterrence challenges?

Mr. MCCONNELL. The W76–2 and B61–13 programs are recent examples of NNSA using existing production lines to quickly adapt to a changing threat environment and rapidly deliver additional capabilities to address deterrence gaps. NNSA, in coordination with the Department of Defense, will continue to evaluate opportunities to apply similar approaches for future programs, however, these opportunities are rare.

Recognizing that the evolving geostrategic environment presents challenges to the nuclear security enterprise, NNSA is chartering a Nuclear Deterrence Rapid Capability Team using existing authorities to address deterrence gaps identified with the Department of Defense.

PERSONNEL RETENTION EFFORTS

17. Senator COTTON. Mr. McConnell, Fort Chaffee in Arkansas is home to the Training Command for the NNSA's Office of Secure Transportation, which transports nuclear weapons all around the country. What is your plan to improve both recruiting and retention of our transport agents trained here?

Mr. MCCONNELL. The Office of Secure Transportation's (OST) Federal Agents (FAs), also known as Nuclear Materials Couriers (NMCs), safeguard nuclear weapons, weapon components, and Special Nuclear Materials in transit throughout the nuclear security enterprise.

Recruitment and retention of our FAs remains a top priority for NNSA. NNSA recently approved a 1-year extension of OST's 25 percent recruitment incentive for NMCs. Since offering this incentive in April 2023, OST has increased Federal Agent class sizes. NNSA is actively recruiting OST agents to ensure our mission is executed securely and we continue to prioritize hiring for these critical positions.

QUESTIONS SUBMITTED BY SENATOR TOMMY TUBERVILLE

ENRICHED URANIUM SUPPLY

18. Senator TUBERVILLE. Mr. McConnell, I have been a proponent of thorium-based salt reactors for a long time, which is a promising energy source technology that we invented and later abandoned, but that China is known to be pursuing in our stead. Resuming the development of this technology relies on the United States taking advantage of our stockpile of Uranium–233—the largest inventory in the world—which the Department of Energy has unfortunately identified for disposal. Can you tell us the size and disposition of our remaining Uranium–233 inventory today?

Mr. MCCONNELL. Safely processing and disposing of the U–233 inventory at Oak Ridge remains one of the Department's highest cleanup priorities. Disposing of the remaining U–233 will reduce the security posture at Oak Ridge National Laboratory, enable the demolition of legacy facilities, and significantly reduce security costs. The Department has completed direct disposition of about half of the total U–233 inventory at Oak Ridge. The remaining U–233 requires processing and down-blending before disposal, and the Department has processed approximately 40 percent of this material.

19. Senator TUBERVILLE. Mr. McConnell, what is the Department's latest plan for the material?

Mr. MCCONNELL. The Department will continue to process and dispose of the remaining U–233 at Oak Ridge, consistent with congressional direction. Our approach is enabling the Department to process U–233 in a cost-effective manner while also providing private industry with isotopes for next-generation cancer treatments. There is no suitable long-term storage solution for the U–233. If the Department were to forgo processing and down-blending, the government would need to create a suitable storage option, which would entail considerable time and cost. This could

also jeopardize financial and other support for the disposition project and impact current contracts. Those impacts would eliminate material for cancer treatments worldwide and further impact the government financially.

20. Senator TUBERVILLE. Mr. McConnell, what can you tell us about thorium reactor technology and what advantage, military or otherwise, might China gain over the United States if it goes unchallenged in its pursuit of it?

Mr. MCCONNELL. Molten Salt Reactors (MSRs) are a class of advanced nuclear reactors under development that have the potential to contribute to many U.S. energy policy objectives. While some MSR designs might use a thorium-based fuel cycle, all current U.S. commercial reactors use uranium and the U.S. infrastructure for nuclear energy is built to support reactors that use uranium. There are two naturally occurring fuel source options for nuclear reactors: uranium and thorium. Both have been studied and developed in the past in the United States as potential fuel materials for nuclear energy sources. The choice of fuel material to be used in a nuclear reactor is made by the developers of the commercial reactor, and some MSR developers are designing concepts that could use thorium as fuel. With the absence of an economic driver to establish such a commercial thorium fuel infrastructure and with the current abundance of uranium, U.S. Government investment in a thorium fuel cycle is not warranted at this time. If a need for thorium fuel emerges in the future, this position may be revisited. The use of thorium fuels also poses a proliferation risk which would need to be mitigated to support their use in reactors.

QUESTIONS SUBMITTED BY SENATOR ELIZABETH WARREN

RIGHT-TO-REPAIR

21. Senator WARREN. General Bussiere, you stated in the hearing that between the B–1, B–2, and B–52, "we hover around the 50's for aircraft availability just because of spare parts and the legacy weapon sustainment". Does the Air Force own the intellectual property rights needed to manufacture those spare parts itself?

General BUSSIERE. Each aircraft spare part is unique in what it takes to manufacture or refurbish. The Air Force does not own rights to every part the bombers need to operate. Many parts are sent back to the Depots for refurbishment and other parts are re-manufactured after a lengthy process of finding and funding a company that did not initially build it.

22. Senator WARREN. General Bussiere, if the Air Force were allowed to manufacture the spare parts it needs or have the technical data necessary to allow other companies to compete to manufacture those required spare parts, could the bomber availability rate increase?

General BUSSIERE. These matters generally fall under the purview of Air Force Materiel Command (AFMC). As such, Air Force Global Strike Command (AFGSC) defers to AFMC on this inquiry.

23. Senator WARREN. General Bussiere, how can the Air Force prevent new weapon systems from following a similar path as the bombers, where sustainment becomes a challenge due to legacy vendors who no longer make needed spare parts?

General BUSSIERE. These matters generally fall under the purview of Air Force Materiel Command (AFMC). As such, Air Force Global Strike Command (AFGSC) defers to AFMC on this inquiry.

NATIONAL NUCLEAR SECURITY ADMINISTRATION NON-PROLIFERATION

24. Senator WARREN. Mr. McConnell and Mr. Hoagland, the fiscal year 2025 continuing resolution shifted $185 million from the NNSA's Office of Defense Nuclear Nonproliferation (DNN) to weapons programs, threatening DNN's critical missions of securing nuclear materials worldwide so they don't fall into the wrong hands, enhancing nuclear detection capabilities, and strengthening arms control verification and monitoring. Do you fully support these DNN missions?

Mr. MCCONNELL. and Mr. HOAGLAND. On behalf of NNSA witnesses: NNSA is fully committed to Defense Nuclear Nonproliferation activities that have the greatest impact on making America safer, stronger, and more prosperous. Nonproliferation and nuclear deterrence are mutually reinforcing for U.S. national security as the strategic threat environment continues to evolve. DNN and Defense Programs (DP) work in concert to ensure that NNSA carries out its mission. DNN leverages the unique technical and scientific knowledge that underpins DP's Stockpile Stew-

ardship Program for a range of nonproliferation, counterproliferation, and counterterrorism missions, from assessing foreign weapons programs and potential terrorist devices to enhancing security and safeguards for civil nuclear applications. Therefore, increasing funding for DP benefits DNN activities and NNSA's mission. Furthermore, DNN is revising its international engagement model to include more cost-sharing with partners thereby reducing program costs.

25. Senator WARREN. Mr. McConnell and Mr. Hoagland, how important is NNSA's role in the U.S. Government's non-proliferation work?

Mr. MCCONNELL. and Mr. HOAGLAND. On behalf of NNSA witnesses: NNSA plays a pivotal leadership role in the U.S. Government's nuclear nonproliferation work, drawing on the unique capabilities of DOE's national laboratories, plants, and sites. From designing space-based sensors that detect nuclear explosions to removing weapons-usable nuclear material from foreign countries and managing and maintaining 24/7/365 capabilities to respond to worldwide nuclear and radiological threats, NNSA performs vital national security functions that do not exist anywhere else in the U.S. Government.

26. Senator WARREN. Mr. McConnell and Mr. Hoagland, how does NNSA plan to ensure that non-proliferation work does not fall behind at a time of growing nuclear risks?

Mr. MCCONNELL. and Mr. HOAGLAND. On behalf of NNSA witnesses: NNSA is strongly committed to its nonproliferation mission. NNSA has a proven record of responding nimbly to a changing global threat environment, ranging from programs to secure nuclear materials after the fall of the Soviet Union; to increased efforts to prevent nuclear and radiological terrorism after the attacks of September 11, 2001; to today's work to address nuclear and radiological threats in one of the most challenging geopolitical environments that the United States has ever faced.

To keep pace with today's threat environment, NNSA is evaluating and leveraging emerging technologies including artificial intelligence, developing advanced monitoring and verification capabilities, revising our international engagement model to include more cost-sharing—simultaneously reducing program costs and improving program sustainability. Additionally, NNSA is committed to providing its unparalleled expertise with nuclear topics to ensure any planning to address growing nuclear risks is technically informed.

27. Senator WARREN. Mr. McConnell and Mr. Hoagland, what impact will the current funding trajectory of DNN have on global nuclear threat reduction programs, particularly those focused on radiological material removal and illicit trafficking prevention?

Mr. MCCONNELL. and Mr. HOAGLAND. On behalf of NNSA witnesses: DNN is reprioritizing its efforts to focus on activities that have the greatest impact on making America safer, stronger, and more prosperous. This includes activities that permanently eliminate radioactive sources and that form partnerships in regions with the highest trafficking risks. To increase efficiency, DNN also is looking to expand burden-sharing with its partners, so that they bear more of the costs for maintenance and sustainment of any support or equipment provided by DNN.

28. Senator WARREN. Mr. McConnell, Admiral Houston, Mr. Hoagland, Vice Admiral Wolfe, Dr. Vann, and General Bussiere, the United States and Russia are no longer engaged in arms control negotiations, and Strategic Arms Reduction Treaty is set to expire in 2026. What specific risks does your office foresee if the U.S. enters a world without legally binding arms control agreements?

Mr. MCCONNELL., Admiral HOUSTON and Mr. HOAGLAND. On behalf of NNSA witnesses: The expiration of the New START Treaty in February 2026—absent any breakthroughs on arms control—will be the first time in decades there is no bilateral international agreement to limit the size of U.S. and Russian strategic nuclear forces. NNSA is preparing for this nuclear environment, including through the development, testing, and demonstration of applied monitoring and verification technologies.

Vice Admiral WOLFE. While the New START Treaty (NST) remains in force, Strategic Systems Programs is committed to fully implementing and complying with the Treaty, to include maintaining inspection readiness of all NST-declared facilities, providing required notifications of motor movements, and adhering to all other treaty requirements.

I defer any questions about a world without legally binding arms control agreements to the Office of the Under Secretary of Defense for Policy (OUSD(P)).

Dr. VANN. *Mr. Walter responded to questions on behalf of Dr. Vann.* The expiration of the New START Treaty in February 2026—absent any breakthroughs on arms control—will be the first time in decades there is no bilateral international agreement to limit the size of United States and Russian strategic nuclear forces.

DOD is preparing for this nuclear environment. Should the circumstances for arms control and risk reduction negotiations emerge, DOD stands ready to contribute to those efforts.

General BUSSIERE. I defer to OSD to discuss arms control agreements.

NATIONAL NUCLEAR SECURITY ADMINISTRATION MODERNIZATION

29. Senator WARREN. Mr. McConnell and Mr. Hoagland, how is the NNSA addressing workforce shortages at key sites?

Mr. MCCONNELL. and Mr. HOAGLAND. On behalf of NNSA witnesses: The workforce at NNSA's laboratories, plants and sites is the organization's most valuable asset. NNSA has successfully implemented several initiatives to attract, recruit and retain employees for our M&O workforces, including recognizing service credit across the nuclear security enterprise to allow the movement of employees and introducing special targeted funds, stipends and bonuses to retain employees where attrition is high. The normalization of attrition to rates comparable to or lower tha historical rates indicate that these retention efforts have been effective.

30. Senator WARREN. Mr. McConnell and Mr. Hoagland, what are you doing to recruit and retain the next generation of nuclear scientists and engineers?

Mr. MCCONNELL. and Mr. HOAGLAND. On behalf of NNSA witnesses: The unique work within the National Nuclear Security Administration (NNSA) requires specialized skills in a broad array of technical fields, many of which are in high demand within the private sector. The science, technology, engineering, and manufacturing capabilities within the nuclear security enterprise underpin NNSA's ability to conduct stockpile stewardship, solve the technical challenges of verifying treaty compliance, combat nuclear terrorism, detect and counter nuclear proliferation, and guard against the threat posed by nuclear technological surprises.

NNSA's ability to meet these national security missions depends upon its ability to recruit, train, and retain its world-class workforce. As part of the strategy to address future workforce needs, NNSA has implemented multiple university programs to provide the next generation of scientists with the opportunity to acquire the experience and expertise needed to sustain the enterprise and provide valuable basic and applied research in support of NNSA's missions.

31. Senator WARREN. Mr. McConnell and Mr. Hoagland, how many NNSA employees have left in 2025?

Mr. MCCONNELL. and Mr. HOAGLAND. On behalf of NNSA witnesses: Since the beginning of the fiscal year 2025 (October 1, 2024) through May 31, 2025, 148 employees in the Federal Salaries and Expenses (FSE) account, 45 employees in the Office of Secure Transportation, and 21 employees in Naval Reactors have separated from NNSA. This includes four previous Deferred Resignation Program participants who have since separated from the agency and no longer receive salary and benefits.

32. Senator WARREN. Mr. McConnell and Mr. Hoagland, how many NNSA employees do you expect will leave or accept offers to leave?

Mr. MCCONNELL. and Mr. HOAGLAND. On behalf of NNSA witnesses: While 130 employees across NNSA have elected to participate in the Office of Personnel Management Deferred Resignation Program and will be resigning or retiring in 2025, NNSA remains committed to upholding its critical mission to protect America's national security.

33. Senator WARREN. Mr. McConnell and Mr. Hoagland, how many years of work experience did each NNSA employee who has left since 2025 have?

Mr. MCCONNELL. and Mr. HOAGLAND. On behalf of NNSA witnesses: NNSA employees who have departed since the beginning of 2025 possess varying professional backgrounds. The average years of Federal Service of employees who retired, resigned, or transferred to other Federal agencies was 16.5 years.

34. Senator WARREN. Mr. McConnell and Mr. Hoagland, do you have any examples or data to indicate that the abrupt firing of parts of the NNSA workforce earlier this year undermines your recruiting efforts?

Mr. MCCONNELL. and Mr. HOAGLAND. On behalf of NNSA witnesses: There are no examples of data that indicate NNSA recruiting efforts have been undermined.

NNSA is actively hiring Nuclear Materials Couriers within the Office of Secure Transportation and over 100 applications have been received to date for each advertised location.

35. Senator WARREN. Mr. McConnell and Mr. Hoagland, how many NNSA employees were fired at the request of the Department of Government Efficiency this year?

Mr. MCCONNELL. and Mr. HOAGLAND. On behalf of NNSA witnesses: DOGE did not direct the termination of employees at NNSA.

36. Senator WARREN. Mr. McConnell and Mr. Hoagland, how many NNSA employees were asked to come back after they had been fired?

Mr. MCCONNELL. and Mr. HOAGLAND. On behalf of NNSA witnesses: Of the 177 probationary employees initially terminated, all terminations were rescinded.

37. Senator WARREN. Mr. McConnell and Mr. Hoagland, how many NNSA employees returned after been asked to come back?

Mr. MCCONNELL. and Mr. HOAGLAND. On behalf of NNSA witnesses: Of the 177 probationary employees initially terminated, all but three elected to return.

38. Senator WARREN. Mr. McConnell and Mr. Hoagland, what were the costs of this firing and rehiring?

Mr. MCCONNELL. and Mr. HOAGLAND. On behalf of NNSA witnesses: NNSA has not conducted an internal audit to determine the costs attributed to these release and rehiring actions.

39. Senator WARREN. Mr. McConnell and Mr. Hoagland, what were the effects of this firing and rehiring on the NNSA's work and mission?

Mr. MCCONNELL. and Mr. HOAGLAND. On behalf of NNSA witnesses: NNSA continues to deliver on its critical national security missions without interruption.

40. Senator WARREN. Mr. McConnell and Mr. Hoagland, with constrained resources and multiple programs facing delays, what criteria is the NNSA using to prioritize among competing modernization efforts?

Mr. MCCONNELL. and Mr. HOAGLAND. On behalf of NNSA witnesses: For stockpile modernization, NNSA executes the nuclear modernization Program of Record (PoR), as directed by the President and authorized and appropriated by Congress. Prioritization and sequencing of programs across the PoR is coordinated through the Nuclear Weapons Council, of which NNSA is a member.

41. Senator WARREN. Mr. McConnell, Admiral Houston, Mr. Hoagland, Vice Admiral Wolfe, and General Bussiere, given the costs of deploying and maintaining a new nuclear cruise missile, should this program take precedence over investments in conventional capabilities like shipbuilding that could achieve similar deterrent effects?

Mr. MCCONNELL, Admiral HOUSTON and Mr. HOAGLAND. On behalf of NNSA witnesses: As this is not in NNSA's purview, NNSA defers to the Department of Defense.

Vice Admiral WOLFE. I defer any questions about investment strategy to the Assistant Secretary of the Navy for Financial Management & Comptroller.

General BUSSIERE. I defer to OSD for investment prioritization. AFGSC remains committed to ensuring the readiness and effectiveness of our Air Force's nuclear deterrent forces.

42. Senator WARREN. Mr. McConnell, Admiral Houston, Mr. Hoagland, Vice Admiral Wolfe, and General Bussiere, has your office evaluated the operational effects that a new nuclear-armed cruise missile would have on the conventional mission?

Mr. MCCONNELL, Admiral HOUSTON, and Mr. HOAGLAND. On behalf of NNSA witnesses: As this is not in NNSA's purview, NNSA defers to the Department of Defense.

Vice Admiral WOLFE. I defer any questions about operational effects of fielding SLCM-N to the Office of the Chief of Naval Operations.

General BUSSIERE. The Air Force has operated nuclear-armed cruise missiles alongside conventional munitions for decades. AFGSC continuously evaluates the readiness of airmen to operate both nuclear and conventional munitions.

43. Senator WARREN. Mr. McConnell, Admiral Houston, Mr. Hoagland, Vice Admiral Wolfe, and General Bussiere, how long could Minuteman III Intercontinental

Ballistic Missiles, the current ground-based leg of the nuclear triad, stay operational?

Mr. MCCONNELL, Admiral HOUSTON, and Mr. HOAGLAND. On behalf of NNSA witnesses: As this is not in NNSA's purview, NNSA defers to the Department of Defense.

Vice Admiral WOLFE. I defer any questions about Minuteman III to Air Force Global Strike Command.

General BUSSIERE. Modernizing the land-leg of the nuclear triad is critical to maintaining a credible and effective nuclear deterrent. AFGSC, in partnership with the AFNWC, will continue operating and sustaining the Minuteman III weapon system to ensure that it remains safe, secure, and effective until it is replaced by Sentinel.

44. Senator WARREN. Mr. McConnell, Admiral Houston, Mr. Hoagland, Vice Admiral Wolfe, and General Bussiere, if the Air Force plans to extend Minuteman III to 2050, would the Air Force and lead contractor Northrop Grumman Corporation benefit from additional time to better plan and manage the Sentinel program?

Mr. MCCONNELL, Admiral HOUSTON, and Mr. HOAGLAND. On behalf of NNSA witnesses: As this is not in NNSA's purview, NNSA defers to the Department of Defense.

Vice Admiral WOLFE. I defer any questions about Minuteman III to Air Force Global Strike Command.

General BUSSIERE. Additional delays will hinder the modernization of our capabilities and increase the risk of being unprepared for future threats. Furthermore, the issue of Diminishing Manufacturing Sources and Material Shortages (DMSMS) will continue to pose considerable challenges, which are expected to worsen as the Minuteman ages. AFGSC is actively collaborating with the Air Force Nuclear Weapons Center (AFNWC) to ensure the Sentinel program is brought online as soon as possible, while also maintaining the capabilities of the Minuteman III.

45. Senator WARREN. Mr. McConnell, Admiral Houston, Mr. Hoagland, Vice Admiral Wolfe, Dr. Vann, and General Bussiere, President Trump and Vice President Vance repeatedly indicated support for denuclearization since taking office in January. Has the Administration or the Department of Defense made denuclearization a priority for your work?

Mr. MCCONNELL, Admiral HOUSTON, and Mr. HOAGLAND. On behalf of NNSA witnesses: The Secretaries of Defense and Energy have reaffirmed the importance of modernizing our nuclear triad. The decision to enter into arms control negotiations rests with the President. NNSA stands ready to support the negotiation and implementation of any such agreements through our unique technical capabilities, especially as related to monitoring and verification.

Vice Admiral WOLFE. I defer any questions about nuclear strategy to the OUSD(P).

Dr. VANN. *Mr. Walter responded to questions on behalf of Dr. Vann.* Risk reduction efforts and arms control can contribute to U.S. security by helping to reduce the risk of nuclear conflict and inadvertent escalation. Any such agreements must enhance U.S. security, be stabilizing, and be verifiable. If the circumstances for arms control negotiations can meet these factors in support of U.S. interests, the Department stands ready to contribute to these efforts. As long as nuclear weapons exist, and until the security environment becomes conducive for disarmament, the Department will maintain a safe, secure, and effective deterrent.

General BUSSIERE. The Administration has been clear about the importance of mitigating the risk of nuclear conflict, including by strengthening the U.S. deterrent. I defer to OSD to provide further details on prioritization.

46. Senator WARREN. Mr. McConnell, Admiral Houston, Mr. Hoagland, Vice Admiral Wolfe, Dr. Vann, and General Bussiere, how is support for denuclearization reflected in the budget request?

Mr. MCCONNELL, Admiral HOUSTON, and Mr. HOAGLAND. On behalf of NNSA witnesses: The Secretaries of Defense and Energy have reaffirmed the importance of modernizing our nuclear triad. The decision to make reductions to the U.S. nuclear stockpile rests with the President.

Vice Admiral WOLFE. I defer any questions about nuclear strategy to the OUSD(P).

Dr. VANN. *Mr. Walter responded to questions on behalf of Dr. Vann.* Risk reduction efforts and arms control can contribute to U.S. security by helping to reduce the risk of nuclear conflict and inadvertent escalation. Any such agreements must enhance U.S. security, be stabilizing, and be verifiable. As long as nuclear weapons

exist, and until the security environment becomes conducive for disarmament, the Department will maintain a safe, secure, and effective deterrent. The Department's budget request funds full scope modernization of U.S. nuclear forces and NC3 capabilities, as well as modernization of the defense industrial base and the Department of Energy's nuclear security enterprise, which are critical to our ability to sustain our legacy nuclear force and deliver a modern force in the coming decades.

General BUSSIERE. I defer to OSD to answer this question.

47. Senator WARREN. Mr. McConnell, Admiral Houston, Mr. Hoagland, Vice Admiral Wolfe, Dr. Vann, and General Bussiere, what steps are being taken by your office to move toward denuclearization?

Mr. MCCONNELL, Admiral HOUSTON, and Mr. HOAGLAND. On behalf of NNSA witnesses: The Secretaries of Defense and Energy have reaffirmed the importance of modernizing our nuclear triad. The decision to make reductions to the U.S. nuclear stockpile rests with the President.

Vice Admiral WOLFE. I defer any questions about nuclear strategy to the OUSD(P).

Dr. VANN. *Mr. Walter responded to questions on behalf of Dr. Vann.* Risk reduction efforts and arms control can contribute to U.S. security by helping to reduce the risk of nuclear conflict and inadvertent escalation. Any such agreements must enhance U.S. security, be stabilizing, and be verifiable. As long as nuclear weapons exist, and until the security environment becomes conducive for disarmament, the Department will maintain a safe, secure, and effective deterrent. We must continue to message to Russia and China that neither country will be safer in an unconstrained environment—a position we repeatedly hear from allies and partners in multilateral venues.

General BUSSIERE. I defer to OSD to answer this question.

48. Senator WARREN. Mr. McConnell, Admiral Houston, Mr. Hoagland, Vice Admiral Wolfe, Dr. Vann, and General Bussiere, there continue to be numerous unanswered questions pertaining to operational impacts of the SLCM-N, impacted U.S. military communities, and relationships with allies such as Australia. How will the SLCM-N affect the conventional mission of our attack submarines?

Mr. MCCONNELL, Admiral HOUSTON, and Mr. HOAGLAND. On behalf of NNSA witnesses: As this is not in NNSA's purview, NNSA defers to the Department of Defense.

Vice Admiral WOLFE. I defer any questions about operational effects to the Office of the Secretary of the Navy.

Dr. VANN. *Mr. Walter responded to questions on behalf of Dr. Vann.* In accordance with section 1640 of the National Defense Authorization Act (NDAA) for fiscal year 2024, as amended, the Department established the SLCM-N program in March 2024. As the program progresses to Milestone A, expected in fiscal year 2026, we will continue to actively evaluate the SLCM-N impacts to U.S. military communities, conventional missions, and allies.

General BUSSIERE. I defer to Navy or OSD to discuss impacts SLCM-N could have on the conventional mission of attack submarines.

49. Senator WARREN. Mr. McConnell, Mr. Hoagland, and Mr. Jarrell, what will the potential infrastructure investment be to house these new missiles in communities that are currently not home to nuclear weapons?

Mr. MCCONNELL, Mr. HOAGLAND, and Mr. JARRELL. On behalf of NNSA and DOE-EM witnesses: As this is not in DOE-EM or NNSA's purview, DOE defers to the Department of Defense.

50. Senator WARREN. Admiral Houston, Vice Admiral Wolfe, Dr. Vann, and General Bussiere, how will this weapons system impact AUKUS [Australia, United Kingdom, United States]?

Admiral HOUSTON. On behalf of NNSA witnesses: As this is not in NNSA's purview, NNSA defers to the Department of Defense.

Vice Admiral WOLFE. I defer any questions about AUKUS to the OUSD(P).

Dr. VANN. *Mr. Walter responded to questions on behalf of Dr. Vann.* We continue to actively evaluate the SLCM-N impacts to U.S. military communities, conventional missions, and allies. We are committed to meeting congressional requirements for SLCM-N in a manner that is fully consistent with our obligations to our AUKUS partners.

General BUSSIERE. I defer to OSD to discuss potential impacts.

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