

**DEPARTMENT OF DEFENSE AUTHORIZATION
REQUEST FOR APPROPRIATIONS FOR FISCAL
YEAR 2025 AND THE FUTURE YEARS DEFENSE
PROGRAM**

HEARINGS

BEFORE THE

**COMMITTEE ON ARMED SERVICES
UNITED STATES SENATE**

ONE HUNDRED EIGHTEENTH CONGRESS

SECOND SESSION
ON

S. 4638

TO AUTHORIZE APPROPRIATIONS FOR FISCAL YEAR 2025 FOR MILITARY
ACTIVITIES OF THE DEPARTMENT OF DEFENSE, FOR MILITARY CON-
STRUCTION, 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**

MAY 8, 21, 22, 2024



DEPARTMENT OF DEFENSE AUTHORIZATION REQUEST FOR APPROPRIATIONS FOR FISCAL YEAR 2025 AND THE FUTURE YEARS DEFENSE PROGRAM—Part 7
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Printed for the use of the Committee on Armed Services



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**DEPARTMENT OF DEFENSE AUTHORIZATION
REQUEST FOR APPROPRIATIONS FOR FIS-
CAL YEAR 2025 AND THE FUTURE YEARS
DEFENSE PROGRAM**

WEDNESDAY, MAY 8, 2024

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 4:53 p.m. in room SR-222, Russell Senate Office Building, Hon. Angus King (Chairman of the Subcommittee) presiding.

Committee Members present: King, Rosen, Fischer, Cotton, and Rounds.

OPENING STATEMENT OF SENATOR ANGUS KING

Senator KING.—[Technical issues.] this hearing before the Subcommittee. Thank you for your service.

The purpose of today's hearing is to examine the President's Budget Request for the Missile Agency and missile defense policies in preparation for the National Defense Authorization Act for Fiscal Year 2025. We are working on that now, and we are hoping the markup on that bill will be at the end of this month. So now is the time.

In today's open hearing I hope that we can address a number of issues. First and foremost is the defense against hypersonic missiles, which we seem woefully unprepared for. Woefully—that is an understatement. Second is the requirement to protect Guam against any threats that China may pose, a daunting task that integrates missile defense from the Army, Navy, and the Missile Defense Agency.

The third issue is how today's threat landscape has changed the nature of integrated air and missile defense, given the conflicts in Ukraine and the Middle East. Ukraine faces all forms of air threats, from drones to hypersonic missiles. Likewise, the recent events in the Middle East and Iran's April 14th attack included over 300 drones, cruise, and ballistic missiles launched toward Israel. I realize much is classified, but it is important for the public to understand how today's missile defense landscape has radically changed in the last 5 years.

The Fiscal Year 2025 President's Budget Request for Missile Defense Agency is \$10.4 billion, a decrease from 2024 enacted budget of \$10.8 billion. I would like to know how the fiscal year 2025 budget request continues your effort for Homeland and regional missile defense as well as defense against hypersonic weapons.

I understand that a mainstay of the AEGIS destroyer, the SM-3 IB missile, was zeroed out this year. I need to understand the impacts of such a decision and the basis thereof.

Again, I want to thank our witnesses for agreeing to appear today, and we will have rounds of 5-minute questions to the witnesses.

Senator Rounds, Senator Fisher is on her way. She will be here shortly. She gave me permission to start.

Senator ROUNDS. I have no doubt.

Senator KING. Yes, but you know that I would not have without that permission.

Senator ROUNDS. Of course.

Senator KING. So, Mr. Hill, are you lead witness?

Mr. HILL. Certainly. Thank you, Chairman.

Senator KING. Please proceed.

STATEMENT OF JOHN D. HILL, DEPUTY ASSISTANT SECRETARY OF DEFENSE FOR SPACE AND MISSILE DEFENSE, DEPARTMENT OF DEFENSE

Mr. HILL. Chairman King and Ranking Member Fischer and distinguished members of the subcommittee, on behalf of the office of the Secretary of Defense thank you for the opportunity to testify on the topic of the President's missile defense budget. You have my full written statement. I ask that it be included in the record. Thank you.

I want to begin by expressing my sincere gratitude to this Committee for your bipartisan approach and steadfast support of the Department's missile defense plans, programs, and posture to fulfill the Nation's missile defense needs. I also want to acknowledge and express my appreciation for the crucial role this Committee played in passing the National Security Supplemental, including the \$60 billion for Ukraine.

Conflicts around the globe continue to demonstrate the centrality of missiles in modern warfare and global strategy and the indispensable role of integrated air and missile defenses in protecting military capabilities, civilian populations, and national sovereignty. Conflicts in Ukraine and the Middle East likewise provide daily reminders of the indispensability of our alliances and the national security imperative of standing with our allies around the world.

To meet the challenges of missile defense, the President's Fiscal Year 2025 Budget Request includes \$28.4 billion for missile defense and defeat. Key investments include \$2.5 billion to develop the next-generation Interceptor for ground-based, mid-course defense, and to extend the service life of the current Ground-Based Interceptors; \$1.9 billion for ballistic and hypersonic defense programs; \$4.7 billion for space-based missile warning systems; \$1.5 billion for the Army and Missile Defense Agency for the development and procurement of the Guam defense system.

These and other investments in missile defenses and advanced early warning systems will continue to expand decision space for our military and civilian leaders, preserve our forces' freedom of maneuver, and strengthen our integrated deterrence and overall defense posture.

Keeping pace against rapidly evolving threats requires continued improvement in our active missile defenses as well as pursuit of comprehensive missile defeat approaches to expand our response options. The Department is prioritizing efforts across the entire engagement space to improve the probability of a successful intercept and improve the efficiency with which we conduct missile engagements and defeat missile threats. To achieve these goals we are developing and fielding better sensors, on earth and in space, that can provide higher fidelity warning, tracking, discrimination, and kill assessment data.

The Department is also putting a greater emphasis on non-kinetic missile defeat capabilities, including options in directed energy, electronic warfare, and cyber, which expand both right-of-launch and left-of-launch options against the evolving threats.

In closing, thank you again to the Committee for your partnership and for your tireless dedication to the Department and our servicemembers. Additionally, I want to thank each of you for your service to your constituents and to the Nation. I look forward to answering your questions.

[The prepared statement of Mr. John D. Hill follows:]

PREPARED STATEMENT BY JOHN D. HILL

INTRODUCTION

Chairman King, Ranking Member Fischer, and distinguished members of the Subcommittee. On behalf of the Office of the Secretary of Defense, thank you for the opportunity to testify on the topic of the President's "Missile Defense Budget." I am honored to join Lieutenant General Heath Collins from the Missile Defense Agency (MDA), Lieutenant General Sean Gainey from the U.S. Army Space and Missile Defense Command (SMDC), and General Gregory M. Guillot from U.S. Northern Command (USNORTHCOM).

Today, I will review how air and missile threats have evolved over the last year, provide an update on our progress in policy and strategy implementation, and explain how the Department's fiscal year 2025 budget request of \$28.4 billion for missile defense and missile defeat programs supports continued efforts.

THE EVOLVING THREAT

As the 2022 Missile Defense Review (MDR) highlights, missiles are "a principal means by which adversaries seek to project conventional or nuclear military power." Conflicts around the globe continue to demonstrate the centrality of missiles in modern warfare and global strategy, and the indispensable role of integrated air and missile defenses (IAMD) in protecting military capabilities, civilian populations, and national sovereignty.

It has been over 2 years since Russia launched its full-scale invasion of Ukraine. In response, Ukraine's employment of a wide array of air and missile defenses—including legacy fundamental to defending Ukrainian forces and civilians, protecting critical infrastructure, and preserving freedom, self-determination, and sovereignty against ruthless, authoritarian aggression. Innovative solutions and resourcefulness have embodied these efforts, as seen through the example of the "FrankenSAM" program, wherein the Department of Defense, working with Ukrainian forces, successfully adapted legacy Ukrainian launchers to utilize Western-supplied missiles, enabling more widespread air and missile defense coverage than would otherwise be achievable. Meanwhile, Russia is adapting by bolstering its production of missiles and drones and acquiring additional systems from Iran and the Democratic People's Republic of Korea (DPRK).

In the Middle East, Iran-backed militant groups have targeted Israel, U.S. military forces, and maritime commercial shipping operating in the Red Sea, the Bab al-Mandeb Strait, and the Gulf of Aden. Hamas, Lebanese Hizballah, the Houthis, and Iran-aligned militia groups (IAMG) in Iraq and Syria accept Iranian military support in many forms, including capabilities such as uncrewed aerial vehicles, ballistic missiles, and cruise missiles. In the aftermath of the October 7 attacks, the United States temporarily transferred its two Iron Dome batteries to Israel and replenished Iron Dome interceptors. The United States has relied on air and missile defenses, such as the Navy’s AEGIS Weapon System with Standard Missiles and the Phalanx close-range defense system, to counter threats to our forces, commercial shipping, and our partners in the region. Additionally, the United States surged Terminal High Altitude Area Defense (THAAD) and PATRIOT to the region. Most recently, Israel’s successful employment on April 13 of IAMD, with support from the United States and other countries, to defend itself against Iran’s direct attacks with drones, cruise missiles, and ballistic missiles underscored the indispensability of IAMD in modern military posture.

to develop a range of missile capabilities that—combined with coercive activities—threaten regional stability. As outlined in the National Defense Strategy, the most comprehensive and serious challenge to U.S. national security is the PRC’s coercive and increasingly aggressive efforts to refashion the Indo-Pacific region and international system to suit its authoritarian preferences. The PRC is also developing and growing its offensive arsenal, including rapid advancement of ballistic, hypersonic, and cruise missile capabilities. As highlighted in the Department’s 2023 China Military Power Report, the PRC is developing a hypersonic glide vehicle that is likely intended to be capable of striking U.S., allied, and partner military bases and fleets in the Indo-Pacific region.

The DPRK also continues to diversify its missile and nuclear programs in line with Kim Jong Un’s defense modernization goals. In 2023, the DPRK launched a solid-propellant intercontinental ballistic missile (ICBM) and a purported submarine-launched cruise missile. The DPRK also continues to diversify its launch platforms. The DPRK also unveiled a new ballistic missile submarine and tested an underwater drone that it claimed was nuclear-capable. Finally, in March 2023, Kim inspected what the DPRK claimed was a tactical nuclear weapon. These programs both undermine regional stability and expand DPRK missile threats to the U.S. Homeland.

U.S. MISSILE DEFENSE POLICY

The 2022 MDR describes missile defense as “a core deterrence-by-denial component of an integrated deterrence strategy.” Missile defenses are integral to achieving the National Defense Strategy’s top priorities of defending the Homeland and deterring strategic attacks missile use by:

- reinforcing U.S. diplomatic and security posture;
- reassuring allies and partners that the United States will not be deterred from fulfilling its global security commitments;
- introducing doubt and uncertainty into adversary attack planning;
- raising the threshold for conflict by reducing adversaries’ incentives to conduct small-scale, coercive attacks;
- denying the benefits of an uncontested attack by adversaries; and
- mitigating damage should deterrence fail.

In short, missile defenses, paired with advanced early warning systems, expand the decision space for our military and civilian leaders and preserve our forces’ freedom of maneuver.

As Russia’s war in Ukraine and the conflict in the Middle East demonstrate, kinetic interceptors remain the primary means to defend against offensive missile, artillery, and rocket attacks. To keep pace against this rapidly evolving threat requires continued improvement of our active missile defenses as well as pursuit of comprehensive missile defeat approaches to expand our response options.

To address these challenges, the Department is prioritizing efforts across the entire engagement space to improve the probability of a successful intercept and reduce interceptor salvo size. To achieve these goals, we are developing and fielding better sensors—on Earth and in space—that can provide higher fidelity warning, tracking, and kill assessment data to reduce the number of interceptors required to defeat each incoming threat missile. These investments will also deliver improved fire control and discrimination capabilities. Space-based sensors both homeland and regional missile warning, missile tracking, and missile defense architectures. The Department is also putting a greater emphasis on both kinetic and non-kinetic mis-

sile defeat capabilities, which encompass right-of-launch and left-of-launch capabilities, to expand our options against these threats.

INVESTMENTS

For fiscal year 2025, the President’s Budget Request includes \$28.4 billion for missile defeat and defense to defend the Homeland, our deployed forces, allies, and partners against increasingly complex missile threats. Important missile defense and defeat investments include:

- \$2.5 billion to develop the Next Generation Interceptor (NGI) for ground-based midcourse defense, and to extend the service life of the current Ground Based Interceptors (GBI).
- \$1.9 billion for ballistic and hypersonic defense programs, which includes \$175 million for the Glide Phase Interceptor (MDA), \$653 million for SM–6 Block IA (Navy), and \$963 million for PAC–3 Missile Segment Enhancement (Army).
- \$4.7 billion for Space-Based Missile Warning Systems, which includes \$2.6 billion in resilient low Earth orbit (LEO) and medium Earth orbit (MEO) missile warning/missile tracking systems, and \$2.1 billion in Overhead Persistent Infrared (OPIR) Systems.
- \$1.5 billion for the Army and MDA for the development and procurement of the Guam Defense System.
- \$1.3 billion for Sea-Based Weapons Systems. The Department will stop procurement of the SM–3 Block IB missile after fiscal year 2024.
- \$1.0 billion for Army IAMD.
- \$1.0 billion for Lower Tier Air Missile Defense Sensor (LTAMDS) research, development, test, and evaluation (RDT&E).
- \$384 million for Over-the-Horizon Radar modernization and Cruise Missile Defense of the Homeland.

The Department’s fiscal year 2025 missile defense and defeat budget meets evolving threats head-on as one critical element of the Department’s broader integrated deterrence strategy.

Homeland Missile Defense

As stated in the National Defense Strategy, the Department’s top priority is to defend the U.S. Homeland. The United States relies on strategic deterrence to address and deter large intercontinental-range nuclear missile threats to the Homeland from the PRC and Russia. The Ground-based Midcourse Defense (GMD) System protects the Homeland—including Hawaii and Alaska—against ICBM threats from the DPRK and potentially Iran, if it were to develop an ICBM capability. The most technically effective, least costly, and rapid approach to staying ahead of the growing DPRK threat and the potential Iranian threat is to increase our ability to successfully prosecute a missile defense engagement and reduce the numbers of interceptors needed to accomplish an engagement. To this end, in addition to sensor developments and deployments previously discussed, we are developing the NGI for ground-based midcourse defense. We plan to emplace the first NGI by 2028, and to acquire 20 NGIs for deployment at potentially replacing the existing GBI.

In September 2023, Secretary Austin issued policy guidance for Air and Cruise Missile Defense of the Homeland. The Secretary’s action followed a comprehensive re-assessment of our approach to air defense of the Homeland as currently reflected in Operation NOBLE EAGLE. The revised guidance will inform development of future years’ budgets for the investments necessary to pace homeland air and cruise missile defense activities to the growing multi-domain threat posed by the PRC while also accounting for the acute threat posed by Russia. In the near term, to address the emergent threat posed by advanced cruise missiles, the Department is taking such measures as fielding over-the-horizon radars and cloud-based command and control systems that will improve our ability to detect and respond to potential strikes and thereby decrease the risks from cruise missile strikes against U.S. critical assets.

Additionally, following the Deputy Secretary’s 2022 designation of a lead Military Department to begin planning for and coordinating the acquisition of air and cruise missile defenses of the Homeland, the Air Force, with the support of the Army, is nearing completion of a comprehensive analysis of alternatives that will inform our investments in this strategically important capability.

The 2022 MDR is clear that an attack on Guam or any other U.S. territory by any adversary will be considered a direct attack on the United States and will be met with an appropriate response. The architecture for defense of Guam against di-

verse missile attacks therefore must be commensurate with its unique status as an unequivocal part of the United States, its vital geography, and the numerous operational capabilities it hosts. The Department is developing and funding a persistent 360-degree layered defense capability to protect Guam against simultaneous raids of cruise, ballistic, maneuvering, and hypersonic threats. MDA is impacts and required mitigation associated with an Enhanced IAMD system for the defense of Guam.

The Department's efforts to create a layered IAMD architecture on Guam are neither simple nor without cost. We have to join together diverse, Military Service-specific IAMD capabilities with broader command and control systems into an optimal mix of sensors and shooters. IAMD systems—with both active and passive features—must also be linked with other elements of offensive military posture. These are just a few examples of the challenges that we face as we pursue this top priority of U.S. Homeland IAMD in the Indo-Pacific region.

Regional Missile Defense

The United States has developed layered, conventionally armed, multi-domain missile defense architectures to protect our deployed forces and support our allies and partners against theater-range threats. For example:

- On land, the United States fields THAAD batteries to counter short-range ballistic missiles (SRBM), medium-range ballistic missiles (MRBM) and intermediate-range ballistic missiles (IRBM), as well as PATRIOT battalions for terminal defenses against SRBM and MRBM, cruise missiles, aircraft, and uncrewed aircraft systems (UAS). The Army will field the first Indirect Fire Protection Capability (IFPC) battery, designed to defeat cruise missiles, UAS, and rocket, artillery, and mortars, in fiscal year 2026. IFPC is currently undergoing developmental testing and is scheduled to move to operational assessment later this year.
- In the maritime domain, the United States continues to improve AEGIS ballistic missile defense-capable destroyers and cruisers loaded with a variety of SM-2, and the Evolved Sea Sparrow Missile (ESSM). Additionally, in conjunction with Japan, MDA is developing the Glide Phase Interceptor to defend against regional hypersonic threats.

Space Contributions to Homeland and Regional Missile Defense

- In the space domain, the U.S. Space Force (USSF) has commenced launching tranches of LEO satellites every 2 years to provide robust global coverage for missile warning, missile tracking, and low-latency, fire-control quality data for weapons engagement within the Missile Defense System. USSF is leveraging the advances made by MDA's Hypersonic and Ballistic Tracking Space Sensor (HBTSS) prototype program to contribute to this roadmap. In February, MDA and the USSF launched two HBTSS prototype satellites into orbit.
- USSF plans include fielding two epochs of MEO satellites by fiscal year 2031 to perform missile warning and missile tracking. A full LEO and MEO constellation will have the ability to detect and track hypersonic weapons, ballistic missiles, and raids in a high-clutter environment through missile burnout.
- USSF also plans to launch two Next-Generation OPIR geosynchronous Earth orbit satellites by fiscal year 2027, and two Next-Generation OPIR polar satellites by fiscal year 2031 to perform missile warning.

ALLIES AND PARTNERS

NATO

At the 2023 NATO Summit in Vilnius, NATO Allies committed to further strengthening the commitment, several ongoing NATO IAMD initiatives are increasing NATO IAMD capability, improving Allied air surveillance, increasing the Alliance's IAMD readiness and posture, and enhancing NATO's BMD capability. Likewise, NATO Allies continue to acquire their own IAMD capabilities through national, bilateral, and multilateral frameworks, including some that the United States is directly supporting, and which further strengthen NATO's deterrence and defense. NATO's announcement earlier this year that the Alliance would facilitate on behalf of a coalition of Allies the acquisition of up to 1,000 PATRIOT interceptors and support the construction of a PATRIOT production facility in Germany exemplifies this trend. As a member of the Alliance, the United States is contributing technical, programmatic, and policy expertise to inform these initiatives. In addition, the United States is on track to complete the Aegis Ashore site in Poland later this spring and transfer command and control of the capability to NATO this July.

Europe

The Department is working closely with our European Allies and partners on missile defense initiatives to increase their IAMD capabilities, improve our collective ability to share data, and increase integration between our forces. Allies such as Germany, Poland, Romania, Sweden, Finland, Norway, and the Netherlands are acquiring their own IAMD capabilities, and building multinational IAMD procurement programs such as the European Sky Shield Initiative.

Air and missile defenses remain vitally important in Ukraine. Recent passage of the National Security Supplemental budget, with broad bipartisan support, is providing critical support to Ukraine in support of United States national security interests. Because of U.S. security assistance, and that of our Allies and partners, Ukraine has been able to protect its Territory through the Secretary's Ukraine Defense Contact Group, and the multinational IAMD Capability Coalition, the United States and dozens of Allies and partners continue to meet Ukraine's urgent requirements, including by developing innovative air defense solutions. This support remains important to U.S. national security, and that of our Allies and partners. The United States—alongside our Allies—remains steadfast in our commitment to help Ukraine defeat Russia's aggression.

Middle East

The Department continues to partner in the Middle East to design and implement an IAMD architecture. U.S. Central Command (USCENTCOM) is leading these efforts, which include an array of regular workshops, exercises, and trainings. These efforts, combined with security cooperation tools, battle management/command, control and communications systems, and technical assistance, advance the goal of a shared network capable of coordinated defense. Iran's attack on Israel on April 13th laid bare the importance of integrated air and missile defense. The effectiveness of our defensive efforts on April 13th is an output of USCENTCOM's years-long effort to integrate air and missile defense and early warning systems. U.S. air and missile defense deployments to the region bolster deterrence. U.S. capabilities also support our partners' access to early warning missile data and information sharing so that they are better able to defend their territory and citizens and contribute to wider regional security against Iran-backed air and missile threats.

Through an annual U.S. allocation of \$500 million for missile defense to Israel, the United States continues its longstanding cooperation on co-development, co-production, testing, and fielding of the Arrow Weapon System and the David's Sling Weapon System, and co-additional \$1 billion for Iron Dome replenishments and upgrades. Since the October 7, 2023 attacks, and as vividly demonstrated again on April 13, 2024, Israel's missile defense systems have been vital to protecting Israel's population against missile attacks from all directions.

The United States continues to work with the Kingdom of Saudi Arabia and the United Arab Emirates (UAE) to deliver the combat-proven THAAD system to defend against short-range, medium-range, and intermediate-range ballistic missile threats. The Department is currently executing a \$13 billion foreign military sales case to deliver seven THAAD batteries to the Kingdom of Saudi Arabia. The first THAAD interceptors were delivered in July 2023 and the first THAAD battery is on-track to achieve initial operational capability in 2025. The UAE has been operating two THAAD batteries since 2016 and, in January 2022, successfully executed its first real-world intercept against an incoming Houthi ballistic missile. This success has led to follow-on efforts with the UAE to acquire additional missile defense capabilities and sustain their current systems, valued at \$2.9 billion. The United States is also currently in the process of delivering to the Kingdom of Bahrain its first PATRIOT batteries and expects Bahrain to fully operate them in 2025.

Indo-Pacific Region

As we upgrade U.S. IAMD capabilities throughout the Indo-Pacific region, including Guam, we are simultaneously working closely with key international partners such as Japan, the Republic of Korea (ROK), and Australia. This is not simply a force posture issue. Extending deterrence to allies and partners in the region—which includes pursuit of a robust IAMD architecture—is an integral aspect of our mission and provides reassurance that the United States will uphold its international security commitments.

Our IAMD-related engagement with these allies is robust. Japan—one of the United States' strongest partners on missile defense—recently concluded a visit by its Prime Minister to Washington, DC. Given rapidly increasing Indo-Pacific threats, Japan plans to increase defense spending to roughly 2 percent of GDP by its fiscal year 2027, with significant new investments in missile defense, counter-strike, space, and other capabilities. Prominent among these efforts is the counter-

hypersonic Glide Phase Interceptor cooperative development project, a top priority to which Japan will allocate \$1 billion. Glide Phase Interceptor cooperative development will build on synergies accumulated from decades of United States-Japan missile defense cooperation.

The overall scope of our IAMD cooperation with the ROK has expanded significantly under President Yoon's Administration. We have improved the ROK's support for the United States' THAAD posture on the Korean Peninsula, and we are pursuing additional initiatives aimed at improving integration and interoperability.

Trilaterally, the Department has been actively involved in facilitating IAMD cooperation between the ROK and Japan. These efforts have resulted in new operational arrangements such as the December 2023 activation of a trilateral early missile warning data-sharing mechanism against DPRK threats.

We are also working closely with Australia to enhance its regional IAMD capabilities. Australia is investing in joint battle management systems to improve its interoperability with the United States and other allies and partners, and we are actively engaged in broad-based, IAMD-focused discussions with the Australians to help drive future bilateral collaboration.

Overall, current U.S. efforts in the Indo-Pacific region are aimed at laying the diplomatic, security and technical foundations needed for the establishment of a regional IAMD architecture. While this vision of connectivity will ultimately take years to realize, near-term achievements.

CONCLUSION

As the current war in Ukraine and the conflict in the Middle East demonstrate, and as seen in the pacing challenge posed by the PRC and the destabilizing threats of the DPRK and Iran, in this era of missile centric warfare, active missile defenses are an essential element of a credible military force posture and integrated deterrence. The Fiscal Year 2025 budget request makes crucial investments in missile defenses to protect the Homeland, our forces abroad, and our allies and partners around the globe.

Thank you again for this opportunity to testify and thank you for the role this Subcommittee plays in supporting our Homeland and regional missile defense interests. I look forward to our discussion and to answering your questions.

Senator KING. General, are you going to add to the testimony or simply take questions. General? I would love to hear from you.

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

General GUILLOT. Yes, sir. Chairman King and distinguished Members of the Subcommittee, it is a high honor to command and represent the women and men of the North American Aerospace Defense Command and United States Central Command, and I thank you for the opportunity to testify today.

I am pleased to appear alongside my friends, Lieutenant General Collins, Lieutenant General Gainey, and DASD Hill. NORAD and NORTHCOM work very closely with each of them as we depend on the robust capabilities they provide that enable and empower our missile defense and other critical homeland defense missions.

The United States and Canada face an extraordinarily complex strategic environment. Our competitors have fielded advanced ballistic and cruise missile systems designed to strike civilian and military infrastructure in North America, both above and below the nuclear threshold.

As an update to my previous testimony earlier this year before the Armed Services Committee I am increasingly concerned by the expanded military cooperation and reported technology transfers between Russia, China, Iran, and North Korea. Further, Iran's direct attack against Israel on April 13th marked a strategic shift and clearly illustrates the continued need for integrated air and

missile defense systems to defeat threats, ranging from ballistic and cruise missiles to unmanned aerial systems. Layered domain awareness systems that detect threats from the seabed to space and defensive capabilities such as the next-generation Interceptor are critical to the homeland defense mission and remain key NORAD and NORTHCOM priorities.

In addition to the missile threats, adversaries' cyber capabilities and emerging technologies such as small unmanned aerial systems present significant risks to North America's critical infrastructure. NORTHCOM and CYBERCOM defend the networks daily from adversaries' cyberattacks, and incidents of small UAS [unmanned aircraft systems] operating inside the U.S. and Canada near civilian and military infrastructure are increasing and require timely and well-coordinated interagency response.

The United States, in concert with global network of like-minded allies and partners requires innovation and engagement across the entire spectrum of military, diplomacy, foreign aid, and strategic communication to counter our competitors' maligned influence and increasing capability to threaten North America.

The Active defense of North America requires NORAD [North American Aerospace Defense Command] and NORTHCOM [United States Northern Command] to actively campaign in all domains and across all avenues of approach. The success of our missions relies on detecting potential threats far from our shores and quickly sharing critical information between combatant commands, conventional and special operations forces, the intelligence community, and the spectrum of interagency and international partners.

The importance of that information flow cannot be overstated, and I strongly support the Department's work to advance the combined Joint All-Domain Command and Control concept. The challenges facing our Nation are real, but there should be no doubt about NORAD and NORTHCOM's resolve to deter aggression, and, if necessary, defeat threats to our nations and our citizens.

Again, thank you, sir, for the opportunity to appear this afternoon, and I look forward to your questions.

[The prepared statement of General Gregory M. Guillot follows:]

PREPARED STATEMENT BY GENERAL GREGORY M. GUILLOT

Chairman King, Ranking Member Fischer, and distinguished Members of the Subcommittee: thank you for the opportunity to testify today and for the honor of representing the men and women of United States Northern Command (USNORTHCOM) and North American Aerospace Defense Command (NORAD). Since assuming command in early February, my initial actions and priorities have included maintaining our vital homeland defense mission throughout a seamless leadership transition; strengthening USNORTHCOM and NORAD's vital network of Department of Defense (DOD), international, private sector, and interagency mission partners; and conducting a thorough assessment of the Commands' personnel, missions, and resourcing. I look forward to establishing personal relationships with leaders throughout the commands' area of responsibility and across the U.S. Government as those ties are critical to the successful execution of USNORTHCOM and NORAD's no-fail missions.

It is already apparent that the strategic environment facing the United States and Canada—and our allies and partners—presents significant risks to our Homeland, our citizens, and our vital national interests. Across all domains and avenues, competitors are exploiting conflicts and crises around the world to undermine U.S. global leadership and our democratic institutions. Our competitors continue to develop and deploy highly advanced kinetic and non-kinetic weapons systems capable of disrupting or defeating military and civilian targets in North America. These

threats are difficult to detect and can strike with limited warning, which reduces the time and response options available to our national leaders and increases the risk of miscalculation and escalation during periods of heightened tension, crisis, and conflict.

As recent events have made clear, overseas crises increasingly carry significant implications for homeland defense. Regional conflicts routinely have the potential to expand into broader crises that directly impact U.S. and allied interests. Russia's unprovoked war against Ukraine and the horrific October 7th Hamas terrorist attacks against Israel demonstrate how seemingly isolated events, regardless of whether the United States and our allies are directly involved, have the potential to reach our own shores. Those ripple effects can include competitor information operations directed against the American public and civil unrest and violence within the United States, or attacks directly targeting the United States and our interests.

Competitors like the People's Republic of China (PRC) and Russia are well aware that the U.S. military is the strongest in the world and highly capable of deploying forces anywhere on the planet to deter aggression and de-escalate potential crises. Accordingly, those competitors have sought to hold defense critical infrastructure in the United States at risk with kinetic and non-kinetic systems intended to impede our ability to flow forces overseas. That strategy must be taken into account in planning for the forward deployment of U.S. forces and resources, as moving assets overseas has the potential to affect the availability of assets assigned to homeland defense or force mobilization missions.

The realities of the 21st Century strategic environment require a flexible, adaptive global approach that recognizes the fact that our competitors can hold the U.S. Homeland—and the homelands of our allies and partners—at risk with conventional, nuclear, and non-kinetic capabilities as part of a broad effort to force the United States to accept increased risk when deploying forces in support of overseas operations. Preserving the full range of options for defending U.S. national interests requires homeland defense to remain a fundamental consideration at every stage of DOD planning, policy, and budgeting.

A globally integrated approach to planning and actions must also extend beyond the Department of Defense and should be embraced by the whole of the U.S. Government. Success in competition, crisis, or conflict continues to rely on a ready, modern, and capable joint force reinforcing the other core elements of our national power. Our diplomatic corps is essential to shaping the strategic environment and cultivating the network of alliances and partnerships that provide the most significant U.S. advantage against isolated and authoritarian competitors seeking to expand their territory and influence at the expense of their sovereign neighbors. The successful execution of USNORTHCOM and NORAD's missions relies on cohesive strategies, integrated planning, and collaboration across the whole of government, and I look forward to working closely with the members of this Committee as we work together to meet the formidable challenges facing our Nation.

THE THREAT ENVIRONMENT

The threat to the Homeland continues to grow in complexity. Our primary competitors are developing new ways to hold North America at risk, both above and below the nuclear threshold. Designed to constrain our options in a crisis, the capabilities our potential adversaries are pursuing will challenge strategic deterrence and erode strategic stability by limiting our ability to provide actionable warning and narrowing the decision space available to senior leaders. The conflict in the Middle East has also amplified the risk that Iran or a foreign terrorist organization will conduct attacks in the Homeland, either directly or by inspiring homegrown violent extremists to act in their stead.

People's Republic of China (PRC)

The PRC remains the Department's pacing challenge as identified in the 2022 National Defense Strategy (NDS). Beijing has embarked on a wide-ranging military modernization program that is advancing the PRC's homeland-threatening capabilities at an urgent pace. At the strategic level, the PRC is pursuing a rapid quantitative and qualitative expansion of its nuclear arsenal, which now numbers over 500 operational warheads and is on pace to exceed 1,000 by the end of the decade. The PRC probably intends to place a significant portion of these weapons—including over 300 newly constructed intercontinental ballistic missile (ICBM) silos—in a launch-on-warning posture that could increase the risk of miscalculation in a crisis or conflict.

Beijing's strategic modernization program includes a variety of novel weapons designed to bolster the credibility of the PRC's strategic deterrent by ensuring its ability to overcome U.S. missile defenses and retaliate following a strike. These weap-

ons include ICBMs equipped with hypersonic glide vehicles, whose high speed, low trajectory, and maneuvering capabilities challenge our ability to detect, characterize, and warn of inbound threats. The PRC is also developing a fractional orbital bombardment system, designed to further challenge our early warning radars and ballistic missile interceptors.

The Department of Defense’s annual report to Congress on PRC military developments states that the PRC may also be exploring the development of conventionally armed intercontinental-range missile systems that could allow Beijing to strike targets in Alaska and the continental United States without crossing the nuclear threshold. Such systems, if fielded, would further erode strategic stability by challenging our ability to characterize an inbound attack and complicating our decision-making about an appropriate response.

Turning to the maritime domain, in the last 2 years, the PRC has launched the first two hulls of its new Shang III class of nuclear-powered guided-missile submarines (SSGN). If the PRC arms the Shang III with land-attack cruise missiles, the new SSGNs could provide Beijing a clandestine land-attack option beyond the Indo-Pacific region, potentially holding at risk critical infrastructure in Alaska and the U.S. West Coast. While Beijing’s intent for employing these long-range conventional strike capabilities is not fully known, in a future crisis, the PRC could use these weapons—along with its world-class offensive cyber capabilities—to threaten or attack our critical defense infrastructure in an attempt to dissuade or frustrate our force flows across the Pacific and degrade the effectiveness of our forward combat operations.

Meanwhile, the PRC continues to expand its influence and activity in the Arctic. Last summer, Beijing again employed its Xue Long 2 ice-hardened research vessel to conduct the country’s 13th scientific expedition to the Arctic. During its voyage, the vessel deployed autonomous underwater vehicles, floating ice stations, and an acoustic monitoring buoy system in waters off Alaska and Canada to collect data that could inform future PLA Navy deployments to the region. Concurrently, the PRC and Russia conducted their second combined naval patrol to the Bering Sea in as many years. More than 10 vessels—including cruise missile-capable surface combatants—participated in the patrol, which included anti-submarine exercises and other combat training near the Aleutian Islands.

Russia

While the PRC’s strategic capabilities are growing quickly, Russia remains the greatest military threat to the Homeland today. Despite the degradation of its ground forces resulting from two disastrous years of combat in Ukraine, Russia seeks to rapidly rearm and retains the world’s largest arsenal of strategic and non-strategic nuclear weapons and a still formidable capability to threaten North America with precision-strike conventional weapons. Russia has gained extensive operational experience with its most advanced non-nuclear weapons in Ukraine, and has had the opportunity to refine tactics, techniques, and procedures that it could employ in a direct conflict with the United States or our NATO allies. Moreover, Russia’s illegal and unprovoked full-scale invasion of Ukraine and irresponsible nuclear rhetoric have demonstrated to like-minded autocrats that nuclear coercion remains a tool of statecraft in the 21st Century.

Russia’s leaders regularly exercise strategic conflict with the West and are investing heavily to develop new weapons to ensure their ability to hold our Nation at perpetual risk. In the last year, Russia has expanded its force of ICBMs armed with the Avangard hypersonic glide vehicle, designed to evade missile defense radars and interceptors. It is also preparing to deploy the Sarmat heavy ICBM, which Vladimir Putin has claimed will feature a fractional orbital bombardment capability that could enable it to approach North America via a nonstandard trajectory over the South Pole. Russia also continues to develop and test novel experimental weapon systems, like the nuclear-armed Poseidon transoceanic weapon and the Burevestnik nuclear-propelled cruise missile. Russia intends for these systems to challenge US defenses and guarantee Russia’s ability to retaliate after a first strike.

Meanwhile, Russia continues to hone a wide range of non-nuclear capabilities—including cyber weapons and conventionally armed air-, sea-, and ground-launched cruise missiles—to provide options below the nuclear threshold. Russia plans to use these non-nuclear capabilities to strike Western economic and military infrastructure in an attempt to degrade our political will and compel negotiations to terminate an escalating conflict. Russian public statements and military deployments near North America over the last several years make clear that, in the event of war with the United States, Moscow’s targeting strategy for these weapons would include critical infrastructure in the Homeland.

Despite the heavy commitment of its aviation forces in Ukraine, Russia has continued to fly regular out-of-area patrols with its heavy bombers and other military aircraft in multiple areas around the globe—including numerous flights into the North American air defense identification zone since February 2022. Meanwhile, the Russian Navy has increased its long-range operational deployments of cruise missile-capable surface and subsurface vessels above pre-February 2022 levels. In January, Russia deployed a Gorshkov-class frigate to the western Atlantic, where the Russian Defense Ministry claimed the crew rehearsed “delivering a missile strike against an enemy surface target” using its Tsirkon hypersonic missiles. In September, the Russian Pacific Fleet conducted its Finval-2023 exercise, which demonstrated Moscow’s ability to control access to the Arctic through the Bering Strait and included live cruise missile launches by coastal defense units as well as surface and subsurface vessels operating within the U.S. Exclusive Economic Zone off Alaska.

Finally, in late 2022, the Russian Pacific Fleet received its first Severodvinsk-class nuclear-powered guided missile submarine (SSGN), introducing a land-attack cruise missile threat to the U.S. West Coast similar to that faced by the East Coast since the first Severodvinsk entered service in the Russian Northern Fleet in 2014. Russian media indicates that Moscow now plans to field a total of 12 Severodvinsk hulls, split evenly between the Atlantic and Pacific, enabling the Russian Navy to pose a persistent conventional threat to critical infrastructure throughout most of North America. The threat will only become more acute later in the decade when Severodvinsk SSGNs are armed with the Tsirkon hypersonic missile.

The Democratic People’s Republic of Korea (DPRK)

Over the last 2 years, the DPRK has conducted nearly 100 ballistic missile tests, including 13 ICBM flight tests, as well as three space launch attempts using ICBM-class boosters. Its most recent space launch in November successfully placed a rudimentary intelligence satellite into orbit—capabilities that could advance quickly if Moscow were to offer space cooperation in exchange for North Korean arms deliveries for the war in Ukraine. Ballistic missiles that the DPRK has successfully tested since 2022 include a new and more capable liquid-propellant ICBM as well as the country’s first solid-propellant ICBM, which will further compound warning challenges due to its smaller logistical footprint.

Both systems likely have sufficient boost to deliver a nuclear payload to the entire United States. The DPRK’s closed society and robust security apparatus make it one of our most vexing intelligence challenges and prevent us from confidently assessing the number of ICBMs in its inventory. Nonetheless, I am concerned that Kim Jong Un’s growing ICBM stockpile could approach our capacity to defend North America—a challenge that will only expand in the coming years if Kim Jong Un looks to add multiple reentry vehicles to his missiles and transition his ICBM program from research and development to serialized production and deployment.

Iran

Iran’s materiel support to Russia’s war in Ukraine and political support to Hamas before and following its October 7th attack on Israel, along with Iranian support to Houthi forces challenging commercial shipping, underscore Tehran’s entrenched hostility to the Western-led international order. Iran remains committed to retaliating for the January 2020 death of former IRGC Qods Force Commander Qassem Soleimani, potentially with attacks against current and former senior U.S. officials. Iran also poses a growing cyber threat to U.S. and allied networks and critical infrastructure. Last November, Iranian cyber actors targeted several U.S. water and wastewater facilities, likely in response to U.S. support for Israel. In the last 2 years, the FBI has disrupted two Iranian plots inside the United States to kill U.S. citizens of Iranian origin that have criticized the regime’s autocracy and disregard for human rights. Finally, Iran continues to invest in its nuclear energy and space launch programs, which could provide a potential breakout option should Iran’s leaders decide to pursue a homeland-threatening ICBM.

Violent Extremist Organizations

The likelihood of a significant terrorist attack in the Homeland has almost certainly increased since the beginning of the Israel-Hamas conflict. Multiple terrorist groups—including ISIS and al Qaeda—have leveraged the crisis to generate propaganda designed to inspire followers to conduct attacks, including in North America. The increasingly diffuse nature of the transnational terrorist threat challenges our law enforcement partners’ ability to detect and disrupt attack plotting against the Homeland and leaves us vulnerable to surprise. Commercial and general aviation likely persist as preferred targets due to the disproportionate economic and psychological impact such attacks would generate. I also continue to watch the Israel-

Hamas conflict for signs that escalation is expanding beyond the region and remain concerned with the threat from Lebanese Hizballah—a group with international reach and a history of conducting attacks in the Western Hemisphere that continues long-term contingency planning in the Homeland.

Regional Security Threats

Transnational criminal organizations in Mexico and elsewhere in the Western Hemisphere continue to foster instability and challenge the rule of law, creating potential opportunities for our State and non-State adversaries to expand their access and influence along our southern approaches. Irregular migration through Mexico reached record levels in the last year, and drug-related violence has escalated as rival cartels fight for control of lucrative drug and human trafficking routes. Cartels have also demonstrated a growing willingness to directly engage Mexican military, security forces, and government officials, highlighting the need for continued theater security cooperation with our partners in Mexico.

Small Unmanned Aircraft Systems (sUAS)

We continue to see a rapid proliferation of sUAS technology and usage in the Homeland, including near our military installations. While most of this activity can likely be attributed to hobbyists, sUAS could be exploited by nefarious actors for surveillance, illicit trafficking, or—in a worst case—attacks on domestic critical infrastructure. Unauthorized sUAS flights over Government installations and civilian infrastructure have the potential to disrupt critical services and threaten force protection and mission assurance. Given the growing prevalence of sUAS available for military, commercial, and recreational use, NORAD, USNORTHCOM, and our inter-agency partners face mounting challenges in early detection and threat characterization, owner and operator attribution, and—when necessary—mitigation and interdiction.

By all indications, sUAS will present a safety and security risk to military installations and other critical infrastructure for the foreseeable future. Mitigating those risks requires a dedicated effort across all Federal Departments and agencies, State, local, tribal and territorial communities, and Congress to further develop the capabilities, coordination, and legal authorities necessary for detecting, tracking, and addressing potential sUAS threats in the homeland.

USNORTHCOM and NORAD PRIORITIES

Against the backdrop of expanding and expansive threats, USNORTHCOM and NORAD remain dedicated to defending the U.S. and Canadian homelands today and well into the future. My key priority remains improved domain awareness in the approaches to North America and around the globe. The ability to detect, classify, and track potential threats to the homeland from the seafloor to space and in the cyber domain is a critical need for USNORTHCOM and NORAD—and for my fellow combatant commanders and international partners. Our core missions, to include defending critical defense infrastructure, require USNORTHCOM and NORAD to see and respond to threats through a globally integrated layered defense extending as far from our shores as possible. That capability is needed to ensure national leaders have as much time as possible to decide the best course of action for deterring, de-escalating, or defeating potential hostile acts.

Investments in capabilities such as Over-the-Horizon Radar (OTHR) and the Integrated Undersea Surveillance System (IUSS) will significantly enhance domain awareness in the air and maritime domains while limiting competitors' ability to approach North America undetected. Likewise, USNORTHCOM and NORAD's ability to track and defeat inbound DPRK long-range ballistic missiles will be significantly enhanced with the Long-Range Discrimination Radar (LRDR), currently planned for integration into the United States' ballistic missile defense architecture in the near future. I remain grateful to this Committee for your support of these important initiatives, and I urge continued emphasis on improving our Nation's ability to find and monitor potential aggressors well before they could target our Homeland.

The rapid pace of change in the strategic environment, to include advancing kinetic and non-kinetic threats and the increasing exploitation of the information space, give reason to believe that successful defense of the homeland tomorrow requires new approaches, technologies, and perspectives. As competitors increasingly focus on holding the homeland at risk in an effort to influence U.S. and allied decisionmaking and limit our options for intervention in overseas crises, USNORTHCOM and NORAD are taking active measures today to ensure the ability of the commands to defend the Homelands in the future.

The United States retains the world's most powerful military and a global network of immensely capable allies and partners. However, information flow between organizations and commands remains stifled by technological and institutional bar-

riers, which too often results in delayed delivery and processing of critical information. Improving global domain awareness is absolutely necessary, but the Department must also expedite the processing and sharing of information between combatant commands, allies, partners, and the interagency community. The Department's prioritization of the Joint All-Domain Command and Control concept highlights the increasing importance of quickly sharing information between sensors, decision-makers, and effectors. For USNORTHCOM and NORAD, the ability to detect potential threats, make well-informed recommendations to leaders, and take appropriate defensive measures is vital, and I will work closely with the Department and the Services to develop this critical capability.

Our Nation must also continue to invest wisely in the military and civilian personnel responsible for planning and executing every one of USNORTHCOM and NORAD's no-fail missions. The demands of defending the Homeland are significant and require an experienced and innovative professional workforce from a broad range of experiences and backgrounds. Our commands continue to prioritize recruiting and retaining exceptional talent from a broad and deep talent pool. Just as our Nation makes substantial investments in cutting-edge technology to outpace our competitors, we must also invest in the dedicated servicemembers and public servants who stand watch over our Nation.

HOMELAND DEFENSE DESIGN NEXT

In recognition of the multi-domain threats to North America, USNORTHCOM and NORAD have prioritized operationalizing the commands and institutionalizing active campaigning in the Homeland. Homeland defense begins well beyond our shores and relies on a layered, integrated defense conducted in full cooperation with our fellow combatant commands and our allies and partners. Rather than simply reacting to the actions of our competitors, USNORTHCOM and NORAD are taking active measures to assess the emerging threats and associated requirements of the near future in to ensure our ability to defend critical assets and safeguard the Nation's ability to project forces forward.

The actions and ambitions of our competitors require the United States and Canada to demonstrate the capability to fight in and from North America, and the commands' Homeland defense design will ensure our ability to defend the Homeland in the coming decades. USNORTHCOM and NORAD's focus on campaigning and operationalizing the commands reflects competitors' growing capability and capacity to hold targets throughout North America at risk and to force United States and Canadian leaders to defend the continent while projecting forces overseas.

It is a near certainty that homeland defense in the coming years will rely less on point defense and traditional kinetic defeat mechanisms in favor of area defense and left-of-launch effects that take full advantage of multi-domain capabilities. While the future of Homeland defense may look vastly different than the current architecture, it will continue to depend on the pillars USNORTHCOM and NORAD use today—all-domain awareness; information dominance; decision superiority; and global integration. I look forward to working with the Department and Congress on these pillars.

The necessity of campaigning in and from North America has been made clear in recent years as competitors have repeatedly demonstrated the capability, capacity, and intent to hold the Homeland at risk. USNORTHCOM and NORAD will continue to advance the commands' ability to conduct globally integrated joint operations in defense of the homeland. The commands will also benefit from the recent transition from the legacy USNORTHCOM and NORAD Command and Control Center (N2C2) to a Joint Operations Center (JOC) that mirrors the capabilities of fellow geographic combatant commands and allows for real-time, all-domain communications and coordination with the commands' DOD and interagency partners.

Finally, the success of homeland and continental defense requires capability and capacity to conduct sustained multi-domain operations in the Arctic. The challenges associated with communicating, operating, and surviving in the Arctic are well documented, and investment by the U.S. Government, the Department, and the military Services reflect the need to compete in the region now and well into the future. I am encouraged by national-level commitments to improving the Port of Nome and building the U.S. Coast Guard's icebreaker fleet; both efforts are visible signs of the U.S. commitment in the region that will support the economic and national security interests of the United States. The DOD and Services have readily acknowledged the importance of operating in far north in their respective Arctic strategies, and further emphasis and investment is necessary to field the Arctic-capable platforms, properly trained and equipped forces, and infrastructure necessary to succeed in a region of enormous strategic consequence. USNORTHCOM's Special Operations

Command-North (SOCNORTH), has demonstrated both the value and challenges associated with Arctic operations through Combined and Joint Operations, activities, and investments in the High North. Most recently, SOCNORTH executed Exercise ARCTIC EDGE 24, readily integrating over 600 USSOF, Partner Nation SOF, and LEAs across the entire North American Arctic.

SECURITY COOPERATION

Global alliances and partnerships based on mutual trust and interoperability provide the United States and our allies with a distinct advantage over our competitors. Our competitors continue their relentless efforts to increase presence, economic leverage, and influence in our region, proving the necessity of security cooperation with USNORTHCOM's exemplary military partners time and again. USNORTHCOM's relationships with military partners in Mexico, Canada, and The Bahamas boost our ability to operate, communicate, and share information for common benefit and are integral to Homeland defense.

The reputation of the United States and the Department of Defense as steadfast and reliable partners is critical to each of those relationships, and USNORTHCOM security cooperation efforts continue to generate significant benefits for regional security and burden sharing with our neighbors. As instability and conflict arise overseas, it is essential to safeguard the security cooperation investments that have an outsized role in defending our homelands and vital interests, including through continued attention to the thriving strategic, economic, social, and defense partnerships close to home.

Mexico

It is already apparent the military-to-military relationship between the United States and Mexico is robust and expanding as both nations address the challenges posed by common threats to our citizens and shared interests. The bonds between USNORTHCOM and our Mexican military partners are broad, resilient, and focused on expanding our combined capability to defend and secure North America from myriad State and non-State threats. Countering competitor influence in the region remains a key priority for USNORTHCOM and our Mexican military partners, and as a direct result, the United States and Mexican militaries are more operationally compatible than at any point in our shared history.

This burgeoning bilateral defense relationship is a result of focused, direct, strategic-level defense engagement and confidence building measures, to include routine senior-leader dialogs such as the North American Defense Ministers conference, combined training like we have witnessed at the U.S. Army Joint Readiness Training Center, exercises such as Exercise Aztec Alligator, and longstanding efforts to promote shared strategic interests.

Assisting our partners in meeting shared security challenges will require modernizing Foreign Military Sales and Direct Commercial Sales (FMS/DCS) by improving institutional responsiveness to partner requests and demonstrating greater agility in fulfilling those requests. The demonstration of timeliness and strategic responsiveness serves to reinforce lines of effort in my campaigning while simultaneously presenting opportunity to outcompete revisionist and revanchist powers present throughout the region.

The growing strength of this vital defense relationship has been made evident through our collaborative approach to common defense challenges, and I am extremely proud of USNORTHCOM's bilateral defense partnership with our Mexican military partners. Those efforts and investments have simultaneously strengthened our common security while helping to reduce Mexico's reliance on Russian and PRC equipment and contracts that often come with costly strings attached.

Canada

As has been made clear by the unique NORAD relationship, Canada has been a steadfast ally for decades and remains our essential security partner in the defense of North America. Canadian investments in domain awareness capabilities, advanced air and maritime platforms, and the Canadian Armed Forces' routine participation in multinational efforts such as Operation Noble Eagle and Exercise ARCTIC EDGE provide an unmatched continental defense architecture. This unique and steadfast partnership, based on common ideals and interests, continues to gain strength and will serve both the United States and Canada for generations to come. Canadian commitment to robust support to NORAD and meeting shared security challenges with the United States and our allies, along with investments in a robust continental defense is key to the success of the bi-national alliance that has successfully deterred aggression against the United States and Canadian Homelands for over 65 years.

The Bahamas

The Bahamas is a growing and willing partner in maritime security and associated intelligence and information sharing, and USNORTHCOM's programs with The Bahamas improve disaster response and climate resiliency for both nations. The USNORTHCOM bilateral frameworks with the Royal Bahamian Defence Force (RBDF), and with other United States partners such as the United States Coast Guard and the Rhode Island National Guard are important to advancing mutual defense and security objectives. USNORTHCOM will continue to work closely with the RBDF to enhance shared maritime domain awareness and cooperation, and I look forward to building further on an already strong and beneficial relationship.

DEFENSE SUPPORT OF CIVIL AUTHORITIES (DSCA)

USNORTHCOM's support of lead Federal agencies in the aftermath of a natural or human-caused disaster remains a core mission that directly bolsters our Homeland defense enterprise while delivering rapid relief to American citizens in times of great need. USNORTHCOM works year-round with our interagency partners to ensure plans, communications, and interagency relationships are always ready to deliver the right military-unique capabilities at the right time and place. Whether providing military personnel to supplement Department of Homeland Security and Customs and Border Protection's mission along our southwest border, assisting U.S. Federal law enforcement agencies efforts to illuminate illicit trafficking networks, or speeding military-unique capabilities to support Federal Emergency Management Agency-led disaster relief, USNORTHCOM is always ready to support our lead Federal agencies. I look forward to establishing and maintaining partnerships with the National Guard Bureau, State, local, tribal, and territorial partners in support of vital DSCA roles.

In addition to delivering life-saving capabilities and resolute support to our fellow Americans and interagency partners in times of crisis, USNORTHCOM's DSCA mission also routinely demonstrates a degree of resilience and well-exercised cooperation that should cast serious doubt in the minds of potential aggressors who may be considering kinetic or non-kinetic attacks against U.S. critical infrastructure. Over many years and multiple significant events, USNORTHCOM and our Federal, State, local, tribal, and territorial partners have proven the ability of communities and agencies across the United States to recover quickly from major disasters. The same lessons learned in those diverse scenarios would apply following an attack against the United States, and competitors must know that an attack would be certain to fail and result in only limited disruption.

As multi-domain threats to critical defense, transportation, and commercial networks and facilities continue to mount, the United States and Canada will face a growing need for resilient, defensible infrastructure. Following the release of the Department's policy guidance regarding defense of critical infrastructure, USNORTHCOM and NORAD have worked with a host of intergovernmental and industry partners to capture the capabilities and relationships necessary to safeguard national infrastructure from attack. This vital effort will continue to present a significant challenge that requires a whole-of-government approach and strong cooperation with Congress and the interagency community to ensure our national ability to deter, defend, and, if necessary, recover quickly from attacks against key infrastructure.

CONCLUSION

USNORTHCOM and NORAD's activities, operations, and investments directly reflect the reality of the strategic environment and the threats and challenges that will continue to face our homeland into the foreseeable future. Based on my ongoing initial assessment of the commands and the challenges we must face, I am confident in our Commands' ability to defend North America, but I am extremely mindful of the mounting threats and challenges presented by determined and well-resourced competitors.

It is a profound honor to lead the extraordinary United States and Canadian soldiers, sailors, airmen, marines, guardians, coast guardsmen, and civilians of USNORTHCOM and NORAD in defense of our great Nations. Those dedicated men and women continue to work tirelessly to defend our Constitution, our citizens, and our shared values. In return, our warriors rely on the resources and support necessary to succeed in their no-fail missions. There should be no doubt that the United States military is the strongest, most capable professional force in history, and that our men and women stand ready today to vigorously defend our Nation against any threat. Thank you for your support and for the opportunity to serve alongside them. I look forward to your questions.

Senator KING. Thank you.

**STATEMENT OF LIEUTENANT GENERAL SEAN A. GAINNEY, USA,
COMMANDING GENERAL, UNITED STATES ARMY SPACE AND
MISSILE DEFENSE COMMAND**

Lieutenant General GAINNEY. Chairman King, Ranking Member Fischer, and distinguished Members of the Subcommittee, I am honored to testify before you as the Commander of the U.S. Army Space and Missile Defense Command and Joint Force Functional Component Command for Integrated Missile Defense, JFFC IMD. In these roles I am representing an incredible organization of 2,300 soldiers and civilians, spanning 13 time zones and 19 locations worldwide. This one team of professionals tirelessly provides base, high-altitude, and missile defense forces and advanced to Army and joint warfighters. I am honored to represent them, and I thank you for your unwavering support for this team and their families.

I also serve as the Senior Commander for both Fort Greely, Alaska, and U.S. Army Garrison-Kwajalein Atoll, two strategically important remote sites that are experiencing challenges with facilities that must be continued to be addressed as we move forward with more priority.

Additionally, I also serve as the Army's lead enterprise integrator for air and missile defense, while my role as JFCC IMD provides operational-level missile defense and expertise and integrates transregional missile defense functions across the joint and combined warfighting force.

As the Army's air and missile defense enterprise integrator, I will continue to use this role to highlight that the Army's air and missile defense remains the Army's most heavily deployed force with the highest demand signal amongst the combatant commands every year. This high optempo continues to provide a significant strain on our formations and families as we must continue to address their needs.

As you know, the urgency for multidomain transregional combat effects continues to increase exponentially. Our adversaries' air and missile-related threats have rapidly expanded in recent year in quantity, variety, and complexity. We see this today in Ukraine and looming on the horizon in the Pacific. It has never been more imperative that we and our allies and partners enhance our missile defense and space capabilities to impose costs on our adversaries, denying them the benefit of using these weapons and ensuring the safeguard of our Nation.

As our adversaries increase their emphasis on space and missile capabilities, our U.S. Army must innovate and evolve. Understanding the challenges in today's threat environment, the Army released our Space Vision, supporting multidomain operations, specifying the Army's role in integrating space capabilities and to join and coalition operations while also interdicting the space capabilities of our adversaries.

Therefore, we seize opportunities to integrate and exercise with other commands and coalition partners, remain fixed together working in dominance in science and technology development, and persisting in gathering soldier proficiency and groundbreaking technology.

It is also increasingly apparent that integrating our space operations and missile defense operations is critical to our national security. Our integration is essential to effectively contributing to the strategic deterrence and responding in crisis. Today we must integrate space and missile defense at every onset of prototyping, concept development, and application, as we do this all in concert with Army, joint, and coalition partners, one voice together around the globe.

Our allies and partners are critical for layered and tiered options to degrade, disrupt, and defeat adversaries, share burden, integrate technology, and protect our mutual homelands. But all of these operational considerations pale in comparison to the will, determination, and trust of the amazing men and women that operate and sustain these advanced systems. We ask a lot of our Army AMD and space formations, and the demand will only increase in the future.

Our planned force structure growth and modernization is critical in the coming years. Thank you for your efforts in supporting them with timely budgets, caring for them and their families, and building trust with the American people, now and in the coming years. Caring for our soldiers and their families is paramount to win in any environment and globe. Thank you for supporting an incredible mission-ready team.

I look forward to addressing your questions. Thank you.

[The prepared statement of Lieutenant General Sean A. Gainey follows:]

PREPARED STATEMENT BY LIEUTENANT GENERAL SEAN A. GAINEY

INTRODUCTION

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

Since January of this year, I have had the privilege of commanding U.S. Army Space and Missile Defense Command (USASMDC) and Joint Functional Component Command—Integrated Missile Defense (JFCC IMD) and acting as the Senior Commander (SC) for both Fort Greely, Alaska, (FGAK) and U.S. Army Garrison-Kwajalein Atoll (USAG-KA). I also serve as our Army's lead enterprise integrator for air and missile defense (IAMD).

It is no secret that our competitors are growing in capability and capacity, particularly in the areas of nuclear, space and missile systems, and in the forefront, ballistic missile threats will continue to increase in complexity. Competitors' ballistic missiles are more mobile, survivable, reliable, and accurate with longer ranges; and hypersonic glide vehicles delivered by ballistic missiles are a developing threat that will inevitably challenge current missile defense systems. They are fielding more advanced missiles in greater numbers to not only deter the United States from intervening in a regional conflict but also to target the U.S. Homeland. The National Defense Strategy (NDS), Nuclear Posture Review (NPR), and Missile Defense Review (MDR) recognized these dynamic changes in the security environment and the imperative to strengthen our integrated deterrence using all our strategic capabilities.

Missile prelaunch survivability is also likely to increase as adversaries strengthen their denial and deception measures and increasingly base missiles on mobile platforms. Furthermore, increasing technical and operational countermeasures continue to challenge defensive systems against ballistic missiles.

The cruise missile threat to U.S. forces is also increasing. While most current land-attack cruise missiles (LACMs) remain subsonic, supersonic and hypersonic missiles have already been deployed, and LACMs will also have increased survivability by minimizing radar signatures and/or using countermeasures.

Europe—and frankly the globe—faces a Russian Federation with about 1,400 deployed nuclear warheads on intercontinental ballistic missiles (ICBMs) and submarine launched ballistic missiles (SLBMs). Despite arms control limitations and resource constraints, development of new ICBMs and SLBMs remains a high Russian priority, and they are expected to retain the largest force of strategic ballistic missiles outside of the United States.

In the Indo-Pacific, the People’s Republic of China (PRC) has the most active and diverse ballistic missile development program, producing technologically advanced systems, selling ballistic missile technology, and expanding the reach of its ballistic missiles to deter foreign powers in future conflict.

Similarly, the Democratic People’s Republic of Korea (DPRK) is also developing long-range ballistic missiles that can threaten the United States and its allies. They continue testing new ICBMs, intermediate-range ballistic missiles, solid-propellant short-range ballistic missiles, an SLBM, and a medium-range ballistic missile while maintaining a large short-range ballistic missile (SRBM) inventory.

In the Middle East, Iran has ballistic missile and space launch development programs, which will result in increased ballistic missile force lethality. Iran’s ballistic missile force exercises extensively hone wartime operational skills and tactics, and their space program progress could accelerate their path to achieving ICBM capabilities given the inherently similar technologies.

Our competitors increasingly leverage their space capabilities and complex missile systems, including unmanned systems, to legitimize their domestic and international agendas. With lower barriers to entry than ever, we can see a future that promulgates directed energy, autonomous systems, machine learning, and a further increase in distributed operations. Indeed, as demonstrated in the current conflicts and at the forefront of the next war, missiles will certainly be employed for increasingly tactical objectives—the missile threat is growing, and we must continue to build a resilient force and adapt to deter and defeat it.

As the commander of USASMDC and JFCC IMD, I am advocating for smart investment in the mission areas of space and IAMD, while also developing other ways—like missile defeat—to deter our competitors. Not only must we deny them the benefit of their potential strikes through resilience and countermeasures as the NDS directs, but we must also credibly communicate our capabilities and capacity to instill doubt in crisis and complicate the adversary decision calculus.

At USASMDC, our mission is to develop and provide current and future global space, missile defense, and high-altitude capabilities to the Army, the joint force, and our allies and partners. We must enable multi-domain combat effects and enhance deterrence, assurance, and detection of strategic attacks to protect the Nation. USASMDC is the U.S. Army’s Service component command (ASCC) for three combatant commands (CCMDs): U.S. Space Command (USSPACECOM), U.S. Northern Command (USNORTHCOM) for ground-based midcourse defense (GMD), and U.S. Strategic Command (USSTRATCOM). At USASMDC, our vision is that of “ONE TEAM,” achieving our shared objectives via collaboration, feedback, assessment, and smart adaptation to continue demonstrating value to warfighters, our Army, our joint interservice and interagency teammates, our Nation, and our allies and partners.

Of course, we cannot do this alone. We integrate our efforts across the globe with organizations like the Missile Defense Agency (MDA), U.S. Space Force (USSF), Army Futures Command, Army Rapid Capabilities and Critical Technologies Office (RCCTO), and Program Executive Offices (PEOs), spanning a myriad of space, missile defense, and high-altitude requirements of the operational environment.

RECENT DEVELOPMENTS

The President’s 2023 Unified Command Plan (UCP) seamlessly transferred the responsibility for missile defense, including JFCC IMD, from USSTRATCOM to USSPACECOM in April of last year.

In October of last year, the Secretary of Defense (SECDEF) assigned the 100th Missile Defense Brigade (MDB) to USNORTHCOM. As a result, USASMDC became ASCC to USNORTHCOM for the GMD mission.

The Army Space Vision Supporting Multidomain Operations was signed last December by the Secretary of the Army, the Chief of Staff of the Army, and the Sergeant Major of the Army. It specifies the Army’s role of integrating joint and coali-

tion space capabilities into our operations while simultaneously interdicting adversary space capabilities.

Throughout third and fourth quarters of fiscal year 2023, USASMDC ensured successful transfer of the Theater Missile Warning mission to USSF's Space Operations Command (SPoC) Missile Warning—Delta 4. Official mission transfer occurred on October 1, 2023, with USASMDC providing residual support and manning to the Joint Tactical Ground Station (JTAGS) sites through April of this year. The realignment of theater missile warning to our sister service enabled USASMDC to take on new mission sets focused on providing close space support to the tactical warfighter while still meeting our joint and coalition responsibilities. Four Army companies will officially case their colors on April 15, 2024, after nearly a quarter century of providing dedicated theater support to the joint and coalition forces worldwide.

One of the first opportunities occurred to integrate Army space-cyber-special operation forces (SOF) capabilities in May 2023. This took place during Army SOF National Training Center Rotation, and during this rotation, the fusion of Army space elements with SOF units in support of their missions in an operational environment was completed successfully. USASMDC supported SOF elements through the production of space-enabled effects and products, and these elements were also invaluable in the joint operations center (JOC) targeting process.

As of September 2023, the USASMDC Force Tracking Mission Management Center (FT MMC) began executing its joint force tracking (FT) mission on behalf of USSPACECOM, which provides continuous FT data services to combatant commanders, U.S. Government agencies, and designated coalition partners in support of command and control, situational awareness, and fratricide reduction. The FT MMC receives data from over 70 different tracking device manufacturers, converts that data into a common message format, and disseminates a tailored data feed out to authorized end users across the Department of Defense and U.S. Government. This allows end users to concentrate on their mission sets while the FT MMC concentrates on force tracking data at an enterprise level. The FT MMC currently processes friendly force tracking (FFT), tagging, tracking and locating (TTL), and personnel recovery (PR) data with over 300,000 devices under management, generating approximately 21 million messages per day.

Pacific Sentry/Space Sentry 23 (PS/SS23), was a tier I exercise where USASMDC provided support to USINDOPACOM and USSPACECOM. USASMDC used PS/SS23 to integrate space control planning teams with USSPACECOM forward elements to provide joint non-kinetic targeting data. USASMDC also integrated with the Australian Defense Force space component throughout the exercise. The exercise demonstrated that the methods used to disseminate intelligence over secure means did not adequately replicate standard intelligence dissemination and that USASMDC will work with the Department of the Army to define the requirement, mitigate risk, and satisfactorily resource USSPACECOM's intelligence requirements.

Keen Edge 24 (KE24), was a USINDOPACOM lead exercise, with support from USSPACECOM and capability and planners from USASMDC. Furthermore, this exercise also supported the coordination of two coalition partners. One of the lessons learned from this exercise was that the number of target aim points (NLRPs) were limited for the exercise, which resulted in the underutilization of space capabilities due to the lack of NLRPs.

In the near term, USASMDC supports several other events. The USASMDC Center of Excellence, Technical Center, and 1st Space Brigade participated in the Project Convergences Capstone 4 (PCC4) experiment to further explore future space capabilities such as the Theater Strike Effects Group (TSEG). USASMDC will also provide forces and full staff participation in Austere Challenge/Global Lightning/Vigilant Shield 24 (AC/GL/VS24). AC/GL/VS24 is USEUCOM's focused Tier I exercise. USSTRATCOM and USNORTHCOM integrated into USEUCOM's battle rhythm, and USSPACECOM will provide a response cell. USASMDC will also conduct external evaluations for the 1st Space Brigade and 100th GMD Brigade during this event, this will be the first tier I that USASMDC formally supports USNORTHCOM as an ASCC. The USEUCOM AOR is the backdrop for the exercise with limited impact to the Homeland to support USNORTHCOM objectives. Finally, USASMDC continues direct integration with United Kingdom Space Command to provide space augmentation to USASMDC mission requirements and possibly provide liaison support in the United Kingdom.

SPACE OPERATIONS

As space, cyber, and SOF continue to work together, 1st Space Brigade capitalized on engagements with U.S. Army Special Operations Command (USASOC) to experi-

ment with new tactical space control technology. Over the past 18 months, the brigade task organized to support a shift toward more expeditionary systems to operate in the corps' extended deep areas of conflict. Recalibrated formations such as the Army space control planning team and tactical experimentation team led these initiatives. The Army space enterprise is considering all options, including integration of existing commercial and government off-the-shelf technologies to demonstrate concepts that fulfill the current demand for a ruggedized, tactical space control system. These new, small form factor systems fit in just a few man-portable cases and employ a team of five Army space professionals. Space Soldiers utilized these systems to provide real-time space effects in a variety of experimentation exercises to include Project Convergence 22, Command Overland, USASOC capabilities exercise, two multi-lateral airborne trainings, and multiple Sage Eagles.

In these venues, Army space operator crews provided on-the-move support to SOF entities by leveraging smaller, more maneuverable technology at the ODA level. The 1st Space Brigade's Soldiers integrated capabilities and space operations into scenarios to demonstrate how space, cyber, and SOF can work together to support multi-domain and full-spectrum operations, providing SOF and the joint force with an enhanced ability to see, sense, stimulate, strike, and assess across the spectrum. SOF partners enable Space Soldiers to gain the necessary placement and access to operate tactical Army space control systems in support of operations within denied, degraded, and disrupted austere operating environments.

To enable and achieve the Army Space Vision, USASMD is investigating the establishment of an Army Space Operations Branch to deliver specialized, highly trained, and certified soldiers with the experience and expertise to provide relevant and timely effects on the battlefield in support of maneuver commanders.

In parallel, USASMD is championing the Army Space Training Strategy. This strategy provides a framework to educate and train the force, not otherwise trained in space operations, to integrate space knowledge, skills, and tasks into professional military education, maneuver training centers, and home station training with the requisite training devices while simultaneously taking an Army enterprise approach to prepare the force to fight, and win, in a contested multi-domain environment.

While technological advances can and will disrupt adversary position, navigation, and timing (PNT) and communications capabilities, we must also employ technological advances to interdict adversary space-based capabilities that provide surveillance and reconnaissance. By collaborating with joint partners, we can further integrate space and high-altitude capabilities to the tactical edge while our science and technology (S&T) efforts continue underway to ensure dominance in space control, deep sensing, and increasing the survivability and capability of our sensing systems.

Integrating space operations into missile defense operations, and vice versa, is of utmost importance to our national security. Increasingly, space and missile defense enterprises depend on and enhance each other. Given recent trends, it has become apparent we cannot effectively contribute to strategic deterrence or respond in crisis if we approach the multi-domain environment with differing business sectors or phases of an operation. Yesterday's military relied on space for warning and targeting, and yesterday's military relied on missile defense to protect the force. Today, space and missile defense integration must be at the very start of our prototyping, concept development, and application—across and in concert with our Army, joint, and coalition partners. This integrated approach is both cost effective and mission effective.

IAMD

S&T investments in high-energy lasers (HEL) executed by USASMD led to the fielding of the Palletized High Energy Laser (P-HEL) and the Directed Energy Maneuver Short Range Air Defense (DE M-SHORAD) systems by the RCCTO. We must continue S&T efforts to increase lethality; reduce size, weight, power, and costs; increase magazine depth; and increase the range-to-effect of high-energy laser weapon systems. USASMD also continues collaborating with the RCCTO to ensure delivery of HEL systems that are reliable and affordable.

USASMD will also continue to provide hypersonic test support to the RCCTO and Navy Conventional Prompt Strike Program Offices and develop hypersonic targets for testing of new and existing IAMD capabilities. USASMD is prepared to support MDA development of the Guam Defense System (GDS) by providing military operator doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy (DOTMLPF-P) analysis and operator requirements support to MDA's acquisition process, development, and fielding.

Additionally, the Missile Defense Agency (MDA) provided software and hardware (HW) deployment of version CX4.0 across the fleet of Terminal High-Altitude Area

Defense (THAAD) forward-based mode radars (AN/TPY-2), providing enhancements to initial hypersonic defense tracking, dynamic discrimination architecture, cybersecurity, electronic protection, objective debris mitigation, and spurious track mitigation.

MDA also completed MILCON activities for the construction of Missile Field 4 at FGAK and is currently installing and testing launch support equipment in each of the silo interface vaults. These activities will continue through the end of calendar year 2024. Furthermore, the additional 20 silos in MF4 will create flexibility for ground system operations and sustainment and will support the subsequent fielding of 20 Next Generation Interceptors in the future.

MF4 enhances interceptor capacity to defend the homeland against long-range ballistic missile attack. The expansion of MF4 increases the footprint of the Missile Defense Complex (MDC) on FGAK, and this increased footprint, along with additional assets, will require increasing physical security assets including personnel and devices. Security personnel requirements have been historically achieved through RFF or mobilized National Guard units from the lower 48 states, and security devices such as cameras, badging, and detection systems will also need to increase based on the expansion.

And finally, USASMDC also continues to ensure site security at FGAK, fielding additional C-sUAS systems in defense of the MDC. Several systems are now employed, and we continue to ensure that we have the most streamlined legal authorities and reporting practices to showcase these capabilities. Moreover, the 49th Missile Defense Battalion, 100th Missile Defense Brigade, and USASMDC continue to coordinate to provide updated, state-of-the-art technology in the continuous effort to defend the MDC against C-sUAS threats.

SENIOR COMMANDER

The mission of the senior commander is to “care for soldiers, families, and Department of the Army Civilians, and to enable unit readiness.” Therefore, the senior commander will routinely resolve installation issues with Army Materiel Command (AMC) and, as needed, the associated ASCC or Direct Reporting Unit. The senior commander also uses the garrison command as the primary organization to provide services and resources to customers in support of accomplishing this mission. All applicable commands support the senior commander in the execution of senior commander responsibilities; therefore, the senior commander is the commander supported by Army Materiel Command’s Garrison Command and affiliated Installation Management Command (IMCOM) director, other installation service providers, and tenants.

I routinely work with the IMCOM director in the Pacific region, regarding concerns and investments at FGAK and USAG-KA. The Fort Greely Community Activity Center has been modernized and has new services that include a new coffee cafe and bar area, greatly improving the community’s food and drink options and providing a safe and relaxing environment. Moreover, ground will be broken this year to add an indoor playground expansion to the activity center by late 2025. Additionally, the garrison continues to support 24-hour operations and intends to improve its aging infrastructure with efforts underway to de-centralize heating in all the buildings and become more energy resilient and less dependent on utility providers in the future. This is to combat projected increased energy costs across Alaska over the next 10 years.

FGAK’s and USAG-KA’s locations are crucial to our national security. Fort Greely is ideally situated in Alaska to address security challenges in Northeast Asia. Kwajalein is home to a U.S. Army garrison and the Ronald Reagan Ballistic Missile Defense Test Site, which is a vital site in the Pacific Islands region—a strategically crucial part of the broader Indo-Pacific.

The Compacts of Free Association between the United States and the Republic of the Marshall Islands, the Federated States of Micronesia, and Palau facilitate our strategic partnership with each of these nations. Under these agreements, the United States has the rights of strategic denial and assured access. In return, we serve as the defense force for these countries. Kwajalein’s Reagan Test Site protects key space assets, contributes to space domain awareness for USSPACECOM, and enables mission essential, missile operational and developmental test capability for USSTRATCOM. However, this unique place and its one-of-a-kind capabilities require significant investment now and in the future. In January of this year, for example, one of the U.S. Army Garrison’s islands, Roi-Namur, was inundated by a series of rogue waves. Half of Roi-Namur, home to most of the Reagan Test Site’s radars, was flooded, causing millions of dollars in damages to an already weakened infrastructure and leaving its radars inoperable for weeks.

Kwajalein's unique position brings joint value, and joint value requires joint investment. Therefore, USASMDC is committed to leading this effort for the Joint Force. We are actively evaluating command relationships and resourcing processes for efficiencies to revitalize this important multi-domain operations mission in the Pacific for the decades ahead.

However, even as I highlight the challenging decades ahead and USASMDC makes incredible strides in these essential, no-fail missions, I want to reiterate that our most important assets are the thousands of soldiers, sailors, airmen, marines, guardians, civilians, and contractors who deploy and employ our IAMD system—and the families that sacrifice to make their efforts possible. Our "ONE TEAM," family mindset at USADMDC has been foundational to our success and empowers mission accomplishment.

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

Senator KING. Thank you.

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

Lieutenant General COLLINS. Thank you, Chairman King, Ranking Member Fischer, distinguished members of the subcommittee. I am honored for the opportunity today to join my colleagues on this panel and discuss the missile defense mission, and I appreciate your continued strong support of the missile defense mission over the years.

To start I would like to thank the men and women behind the development, delivery, and sustainment of the missile defense system that I represent today, our MDA [Missile Defense Agency] family, and the operators of the system all are key partners in this no-fail mission.

We are requesting \$10.4 billion to develop and deploy Homeland missile defenses and improve regional defenses against increasingly diverse and dangerous missile threats, a reality we all witnessed when Iranian and Houthi forces launched over 100 ballistic missiles in addition to cruise missiles and unmanned aerial vehicles against Israel last month.

Our prioritization of decisions will maximize missile defense system capability, capacity, and readiness. We continue to work closely with the combatant commanders and services to help prepare them for the fight of today and tomorrow. To defend our Homeland from ballistic missile attack, the ground-based mid-course defense system, or GMD, remains our Nation's sole protection from limited attacks with the primary focus being the advancing North Korean threat. The ongoing Ground-Based Interceptor, or GBI, service life extension program will continue to improve GBI reliability and availability and will help mitigate risk until the next-generation Interceptor, or NGI, is fielded by the end of 2028.

After 20 years, GMD stands ready, as shown in December 2023, when we successfully executed a GMD intercept flight test using the two 3-stage selectable Ground-Based Interceptor in 2-stage mode, demonstrating increased engagement battle space. We plan to deploy this capability to the entire fleet by the end of this year.

The NGI program remains on track, and as this subcommittee is aware, we recently selected Lockheed Martin to continue as the prime for NGI development, testing, production, and fielding.

Soon we plan to add the Long-Range Discrimination Radar (LRDR) to MDA's operational capability baseline, to enhance track-

ing, discrimination, and hit assessment against long-range missile threats. Today, LRDR is ready to support the space domain awareness mission.

For regional defense, MDA continues to design improvements to the Aegis ballistic missile defense capability and procure the standard Missile 3 Block IIA missiles. We were very pleased with the performance of the Aegis weapon system and the system operators on board the USS *Arleigh Burke* and the USS *Carney*, and the role they played in intercepting the ballistic missiles fired against Israel last month.

In fiscal year 2025, we will also test and deliver SPY-1 radar upgrades and support the Navy in future space domain awareness demonstrations. We will continue U.S. Terminal High Altitude Area Defense, or THAAD, interceptor procurement, fielding and training support in collaboration with the U.S. Army to field the THAAD 4.0 capability to THAAD batteries by the end of 2025. THAAD 4.0 integrates Patriot capabilities with THAAD to increase Patriot defended area and engagement opportunities. We will also begin design work to improve the THAAD system to take on ever-advancing regional threats.

We will continue development of a 360-degree layered missile defense capability for Guam. MDA construction on the Joint Command Center, AN/TPY-6 radar site, and launcher site will begin in fiscal year 2025. By the end of this year we will execute a flight experiment against a medium-range ballistic missile target, using an SM-3 Block IIA interceptor, controlled by the initial Aegis Guam system, using the first TPY-6 transportable array unit.

Today our sea-based terminal defenses protect assets at sea and forces ashore from hypersonic threats. Working with the Navy, we anticipate delivering follow-on Increment 3 capabilities in fiscal year 2025. The Glide Phase Interceptor program, or GPI, weapons system will enable a layered defense against hypersonic glide threats. By the end of fiscal year 2024, MDA will select a single GPI interceptor design to complete development. We will continue to develop and mature the GPI capability and support the planned cooperative development of the GPI with Japan.

We launched the Hypersonic and Ballistic Tracking Space Sensor, or HBTSS, prototype satellites in February of this year to demonstrate fire control solutions generated against hypersonic maneuvering threats from space. Following successful demonstration of HBTSS, the responsibility for fielding HBTSS like fire control capabilities will be taken on by the U.S. Space Force.

I am honored by this opportunity. I greatly appreciate everything this Committee does for Missile Defense Agency and the missile defense mission, and I look forward to your questions.

[The prepared statement of Lieutenant General Heath A. Collins follows:]

PREPARED STATEMENT BY LIEUTENANT GENERAL HEATH A. COLLINS

Chairman King, Vice Chairman Fischer, and distinguished Members of the Subcommittee, I am honored to appear before you today to discuss the Missile Defense Agency (MDA) budget request of \$10.4 billion for fiscal year 2025. Our request will enable the continued execution of the MDA mission to develop, deploy, and support a layered Missile Defense System to defend the United States and its deployed

forces, allies, and international partners from increasingly diverse and dangerous missile threats.

As we witnessed on April 13, 2024, when Iranian forces in Yemen launched over 100 ballistic missiles in addition to cruise missiles and unmanned aerial vehicles against Israel, our potential adversaries place a high priority on developing capabilities to defeat U.S. and allied missile defenses. They are well resourced and are testing and fielding advanced ballistic, hypersonic, and cruise missiles that are increasingly accurate, survivable, and capable of achieving longer ranges and higher levels of maneuverability. Today, many of the newest systems, including hypersonic and anti-ship ballistic missiles, are undergoing unprecedented combat evaluation in Ukraine and the Middle East. This could potentially lead to innovations that challenge missile defenses and lead to broader proliferation as the battlefield effectiveness of these systems is demonstrated. The attack last month against Israel and the ongoing war in Ukraine also highlight the importance of being prepared to defend against large raid sizes involving diverse missile threats. We must prepare ourselves to defend against a level of capability and capacity we have never seen before.

Ensuring our Combatant Commanders and Services have what they need to fight today and win tomorrow is my top priority. Continuous and frank collaboration with the Warfighter is essential to delivering adaptable, affordable capabilities as fast as possible to defeat an increasingly diverse and unprecedented missile threat set. As part of the Department's missile defense enterprise, MDA is committed to collaborating closely with the Warfighter throughout the lifecycle of a capability. There are proven processes in place to identify, prioritize, assess, and validate Warfighter requirements and requests for modifications and upgrades to systems already fielded. MDA works with the Warfighter early in the technology development and product development phases to address a requested capability. We also support Lead Military Department efforts to plan for Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities, and Policy factors. Once a capability is fielded, close collaboration with the Services and Combatant Commands is essential to sustaining and enhancing that capability throughout its service life. Finally, MDA provides real-time technical support to the warfighter, as demonstrated during recent real world operations.

URGENCY OF HYPERSONIC MISSILE DEFENSE

Initially just focused on ballistic missile defense, MDA today is developing weapons systems and sensors to defeat the serious threat posed by hypersonic glide vehicles and maneuvering threats. MDA continues to develop a layered defense capability to defeat regional hypersonic threats with the Glide Phase Intercept (GPI) development program. By the end of fiscal year 2024, MDA will select a single GPI interceptor design with which to complete development. In fiscal year 2025, MDA will continue to develop and mature the GPI capability with a focus on critical technology maturation and risk reduction activities. We will also continue to update the Aegis Weapon System to integrate the GPI interceptor. Our fiscal year 2025 budget request supports the planned cooperative development of the glide phase interceptor with Japan. We expect to complete the formal agreement on that project this spring. Japan will fund and develop key missile components, primarily propulsion elements.

The GPI weapon system design will provide a layered defense with currently deployed Sea-Based Terminal (SBT) capabilities. SBT provides terminal defense of assets at sea and forces ashore. We anticipate delivering SBT Increment 3 capabilities in fiscal year 2025 to provide expanded capability. SBT will demonstrate a simulated engagement against an operationally realistic hypersonic glide vehicle target in fiscal year 2025, and an engagement using a Standard Missile (SM)-6 against a hypersonic glide target in fiscal year 2026.

The Missile Defense System will increasingly leverage the space domain with our Service partners to gain a strategic edge against advanced missile threats. MDA already has demonstrated the ability to generate a fire control solution to track and engage ballistic missile targets using the Space Tracking and Surveillance System demonstration satellites, which are now decommissioned. Today, MDA is on-orbit with the Hypersonic and Ballistic Tracking Space Sensor (HBTSS) and preparing to demonstrate fire control solutions generated from satellites against missile threats that glide and maneuver at hypersonic velocities through the atmosphere. MDA is collaborating with the U.S. Space Force Space Development Agency to demonstrate a fire-control capability to track and defeat advanced missile threats. HBTSS's Launch and Early Orbit Testing period, which began on February 14, 2024, will be followed by testing to characterize and validate performance of the two HBTSS prototype satellites by leveraging MDA and cooperative flight test events. Following a successful demonstration of HBTSS, the responsibility for fielding

HBTS fire-control capabilities will be transferred to the Space Force. When fully operational, the fire-control capability developed through MDA's HBTSS program will be part of the Space Force Proliferated Warfighter Space Architecture and provide a capability to detect hypersonic, ballistic, and other advanced threats earlier than terrestrial radars and send tracking data to the Missile Defense System for handover to missile defense weapons for engagement.

MDA upgraded the Ballistic Missile Defense System Overhead Persistent Infrared (OPIR) Architecture (BOA) 3 years earlier than planned to provide expanded hypersonic tracking capability. Ongoing BOA 8.1 development updates the system architecture to integrate increased raid-handling capability in Increment 8/9. These system architecture updates enable initial integration of Space Development Agency Low Earth Orbit and Space Force Space Systems Command Medium Earth Orbit sensors into BOA for improved tracking and fire control. Fiscal year 2025 funding will continue to develop and test Increment 6C/7 to deliver expanded support that leverages systems and sensors to track maneuvering, hypersonic non-ballistic missiles as well as report maneuvering tracks and impact area predictions to external systems. Increment 6C/7 will also update Command and Control, Battle Management and Communications (C2BMC) to prioritize supporting sensors for defense against hypersonic glide threats.

HOMELAND DEFENSE

The Ground-based Midcourse Defense (GMD) system has protected the U.S. homeland from rogue long-range ballistic missile attacks for almost 20 years. Today, we are improving the reliability of the in-service fleet and developing new capabilities to address the limited but increasingly advanced North Korean long-range ballistic missiles. We continue the U.S. Northern Command's Ground Based Interceptor (GBI) Service Life Extension Program to improve reliability and availability, which we anticipate will extend portions of the existing fleet. These interceptors will help mitigate risk until the Next Generation Interceptor (NGI) is fielded no later than the end of 2028. In parallel, MDA continues to upgrade the ground system infrastructure, communications network, fire control system, warfighter training systems, and missile fields to improve the reliability, capability, cybersecurity, and resiliency of the GMD weapon system.

In December 2023, we successfully executed a GMD intercept flight test, demonstrating the weapon system's capability to intercept an Intermediate Range Ballistic Missile target using the 2-/3-stage selectable GBI in 2-Stage mode equipped with a Capability Enhanced-II Block 1 Exo-atmospheric Kill Vehicle. This was the first intercept flight test of a 3-stage GBI operating in 2-stage mode, meaning the third stage was commanded not to ignite. The earlier release of the kill vehicle provides increased battlespace to the warfighter to execute closer range engagements. With a successful Operational Capability Baseline decision for Increment 6.B in late fiscal year 2024, the software enabling the selectable 2-/3-stage will be deployed for the GBI fleet.

We are developing the Next Generation Interceptor to improve the GMD system's ability to defend against future threats. The Next Generation Interceptor program is currently in its Technology Development Phase and will transition to its Product Development Phase in May 2024. Recently, each one of the two competing Prime Contractor teams successfully completed their Preliminary Design Reviews and Knowledge Points #1. MDA applied lessons learned from other large-scale defense programs that faced increasing costs due to extended design phases involving multiple competitive solution teams which adversely impacted schedule. Due to accelerated contractor execution schedules, MDA had an appreciably larger body of technical knowledge and data available to assess contractor performance ahead of a traditional systems development at this point in the design maturation process. Consistent with the down select contract clause, MDA completed a best value determination using contractor provided objective evidence from their Preliminary Design Reviews and Knowledge Points #1. Last month, MDA selected Lockheed Martin to continue development, testing, production, and fielding of Nation's Next Generation Interceptor.

To support defense of the homeland, MDA is developing, deploying, and sustaining a robust, cyber-secure and networked ground-and sea-based radar architecture that includes the Long Range Discrimination Radar (LRDR) located at Clear Space Force Station, Alaska. LRDR enhances tracking and discrimination, hit assessment, and space-intelligence data collection. The LRDR successfully tracked and discriminated a medium-range ballistic missile (MRBM) target in September 2023. When the radar is added to MDA's Operational Capability Baseline (OCB) in December 2024, LRDR will support the GMD capability against long-range missile

threats. The LRDR completed a Space Domain Awareness (SDA) data collect event in January 2024 and, subsequently, MDA confirmed LRDR and C2BMC are ready and available to provide Space Domain Awareness (SDA) mission capabilities to U.S. Space Command in March. The U.S. Space Force declaration of LRDR ready for early SDA use is imminent. In fiscal year 2025, LRDR will continue support of SDA and will be added to the OCB for the missile defense mission.

The Sea-Based X-Band (SBX) radar provides a relocatable, precision midcourse tracking and discrimination capability supporting homeland defense operations, Missile Defense System testing, data collection, and SDA. SBX completed a rigorous in-port maintenance and capability upgrade period in March 2023 and is currently deployed at-sea conducting homeland defense operations. Fabrication of the SBX replacement radome continues on schedule for installation in January 2026.

Upgraded Early Warning Radars (UEWRs) and the COBRA DANE radar support homeland missile defense and improve midcourse Missile Defense System sensor coverage by providing critical early warning, tracking, object classification, and cueing data. They also provide critical missile warning data and space object detection and tracking data for the Space Surveillance Network. While the Space Force is the overall UEWR and COBRA DANE sustainment organization, MDA provides sustainment support for the radars located in California, Massachusetts, Alaska, United Kingdom, and Greenland.

There are five AN/TPY-2 forward-based radar sites currently deployed worldwide that augment our capabilities to execute the homeland defense mission. Operating at forward locations in key regions, these radars extend detection and early warning capabilities and enhance our ability to track and discriminate inbound targets earlier.

The Space-based Kill Assessment (SKA) experiment of infrared sensors continues to demonstrate hit assessment capabilities for homeland defense. SKA sensors will continue to provide situational awareness of intercepts to U.S. Northern Command and participate in flight tests and engineering activities to characterize sensor capabilities that provide data to support future Post Intercept Assessment capabilities.

Meeting the current and future ballistic missile threat for homeland and regional defense requires global persistence and increased precision and accuracy. The Discriminating Space Sensor (DSS) program, designed to perform birth-to-death tracking and global coverage for discrimination against ballistic missile threat targets, is moving into the next phase of development after successfully completing its ground concept feasibility phase. The next phase, space demonstration, will develop the on-orbit demonstrator and follow a similar path as HBTSS capabilities leading to incorporation into the operational Proliferated Warfighter Space Architecture.

C2BMC Spiral 8.2-5 will enable homeland defense capabilities by providing critical LRDR data to GMD. C2BMC conducts command and control functions for LRDR and executes tasking in direct support of GMD engagements. C2BMC Spiral 8.2-5 delivers the initial ability to receive messages from space command and control to generate acquisition tasking for Aegis Ballistic Missile Defense (BMD) and LRDR. C2BMC S8.2-5 also enables the capability to task Aegis BMD and LRDR to detect, track and report on resident space objects.

REGIONAL DEFENSE

Globally deployed ship-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. In fiscal year 2025, MDA is designing improvements to the Aegis BMD capability, improving SBT defense, advancing weapon system and missile reliability, and enhancing Aegis BMD engagement capacity and lethality. As the Members of this Subcommittee are aware, the Aegis Weapon System, the Standard Missile (SM)-3 Block IB, and the system operators onboard the USS Arleigh Burke and the USS Carney were highly effective in countering the ballistic missiles fired against Israel last month. We will continue to develop Aegis BMD weapon system software to enhance functionality and leverage more-capable radars and National Technical Means.

MDA continues to support defense of NATO's European territory and forces against the ballistic missile threat from outside the Euro-Atlantic region. Aegis Ashore in Romania is operational, and the Chief of Naval Operations accepted Aegis Ashore Poland in December 2023, marking completion of a key MDA contribution to Phase 3 of the European Phased Adaptive Approach. The Poland site is undergoing a maintenance period to upgrade the computer networks and communications systems, which is funded and operated by the U.S. Navy. This will be followed by U.S. European Command acceptance of the site. Then there will be a transfer of au-

thority from U.S. European Command to NATO. Both Aegis Ashore sites are designed to launch the SM-3 Block IBTU and Block IIA missiles.

In the fiscal year 2025 budget, MDA continues to procure the SM-3 Block IIA missile. Previous and planned procurements are on pace to meet current Navy Inventory Objective requirements for Block IIA in fiscal year 2032 as defined by the outcome of the Navy Munitions Requirement process. The fiscal year 2025 Budget proposes to discontinue further production of the SM-3 Block IB missile in favor of SM-3 BLK IIA and continue to evolve the BLK IIA missile within the Aegis Weapons System. MDA will continue to deliver prior year procurements of Block IB and sustain the existing inventory. The final Block IB delivery is currently expected in fiscal year 2028. The SM-3 Block IB has a twelve-year service life and the oldest Block IBs in the fleet will begin to reach the end of service life in fiscal year 2026. The combination of demilitarization and termination of new procurements will result in SM-3 Block IB inventory peaking in fiscal year 2027. The inventory of all variants of SM-3 missiles is managed through the Navy's Global Force Management process to address the capacity requirements for Defense of Guam, European Phased Adaptive Approach, and other Combatant Commander requirements. We will continue to develop Aegis BMD weapon system software to enhance functionality and leverage more-capable radars and National Technical Means.

MDA provides software upgrades to Aegis integrated missile defense destroyers equipped with the AN/SPY-1 radar to support the Space Force Space Domain Awareness mission. The Aegis SDA capability is fully compatible with deployed Navy operations and has appropriate safeguards supporting full Aegis missile defense warfighting capability. We transitioned this important capability to the Navy and supported successful demonstrations on USS Rafael Peralta (DDG 115) in June 2023 and USS Mason (DDG 87) in October 2023. In fiscal year 2025, we will continue to test and deliver this upgrade and support the Navy in future SDA demonstrations.

The Terminal High Altitude Area Defense (THAAD) Weapon System is a globally transportable, ground-based 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 currently supports forward-deployment of two batteries stationed in the U.S. Indo-Pacific Command (INDOPACOM) area of responsibility and an emergency deployment in the U.S. Central Command (CENTCOM) area of responsibility. In fiscal year 2025, we will continue U.S. THAAD interceptor procurement, production of battery hardware, obsolescence mitigation efforts, fielding and training support, the THAAD Stockpile Reliability Program, and modifications to meet growing cybersecurity threats. THAAD will continue to demonstrate capability improvements with rigorous testing throughout the Future Years Defense Program.

THAAD, in conjunction with the U.S. Army, is in the process of fielding the THAAD 4.0 capability to all THAAD batteries. The upgrade was completed at the battery located in Guam in November 2023, and we are in the process of upgrading remaining batteries to be completed by the end of 2025. TH 4.0 capability enables remote launch, Patriot Launch-on-Remote, and integration of Army Patriot Missile Segment Enhancement (MSE) launchers and missiles into the THAAD battery. This capability increases Patriot defended area and engagement opportunities by allowing the MSE interceptor to leverage the highly effective THAAD AN/TPY-2 radar.

THAAD System Build 5.0 is in development and is the largest hardware refresh to-date with operational availability in July 2026. TH 5.0 includes hardware upgrades that address obsolescence and enhances the mission assurance and cybersecurity posture of the weapon system. TH 5.0 incorporates system safety enhancements and engagement refinements resulting in improved performance against the current THAAD assessed threat set.

THAAD System Build 6.0 operational availability has been expedited to 2027 from 2032 and will provide initial capability against maneuvering threats and increase the threat engagement space. TH 6.0 includes capability enhancements to the THAAD interceptor, increased integration with Patriot MSE, and improvements to the cybersecurity risk posture and program protection. Additionally, THAAD will begin initial systems engineering in fiscal year 2025 to support the Army's Integrated Air and Missile Defense (IAMD) Battle Command System (IBCS) integration of THAAD.

AN/TPY-2 radars deployed abroad support THAAD batteries for regional defense. Radar 13, planned for delivery in the second quarter of fiscal year 2025, will be part of THAAD Battery 8. Radar 13 includes significant obsolescence redesigns that are leveraged from ongoing Foreign Military Sales (FMS) cases. As a supplement to each of these weapon systems in regional defense roles, the AN/TPY-2 forward-based radars mentioned earlier extend the capabilities of each by expanding their

detection range and enhancing their ability track and discriminate enemy launches. These radars greatly enhance our ability to protect our allies and deployed soldiers in a regional defense mission.

The C2BMC system includes the operation of a global network enterprise with equipment and personnel in 25 locations across 14 time zones. Funding in fiscal year 2025 continues to provide situational awareness, battle management, training, and SDA capabilities to users within each Combatant Command as well as the global missile defense network. Over the past year the C2BMC system provided INDOPACOM with the ability to acquire and exchange missile track data with multiple partner nations' command and control systems to demonstrate strength in partnering with allies for collective regional missile defense. Funding in fiscal year 2025 continues this effort and includes support for warfighter contingency activities such as those in support of Israel. MDA's C2BMC system is providing sensor data to cue Aegis ships in the region from continued attacks on shipping and other partner interests in the region.

The Department is continuing development of a missile defense system for the defense of Guam against diverse missile threats. We will expand capability and capacity as the threat evolves. In collaboration with the Army and Navy, we are moving toward meeting an INDOPACOM requirement for a persistent 360-degree layered missile defense capability on Guam against simultaneous raids of cruise, ballistic, maneuvering, and hypersonic glide threats. The MDA MILCON designs will complete this calendar year and the Environmental Impact Study will complete in Calendar year 2025. MDA construction will begin in fiscal year 2025, establishing the joint command center, an AN/TPY-6 radar site, and a Navy Standard Missile Vertical Launch System (VLS) site. We will execute a flight experiment intercept in first quarter fiscal year 2025 demonstrating the increased Guam protection capabilities the Department is developing for the western most territories of the homeland, while the integrated Aegis Guam System continues final design and testing.

LEVERAGING SCIENCE AND TECHNOLOGY INNOVATION

MDA is investing in disruptive technologies to deliver dynamic, next generation missile defense capabilities. MDA has an integrated, strategic Science and Technology (S&T) approach that prioritizes identifying and maturing transformational, leap-ahead technologies to address the future threat. Additionally, we continue to rapidly develop near-term technologies to support incremental Missile Defense System upgrades. MDA is collaborating with OSD, the Services and Warfighters, National Laboratories, Universities/Academia, International partners, and Industry (traditional and non-traditional defense partners) to leverage technology development. We are aligning our S&T roadmap to maximize cutting-edge technology to close capability gaps and meet warfighter requirements.

Kinetic capabilities by themselves will not be adequate to keep pace with threats, which continue to increase in complexity, range, and quantity. Accordingly, MDA plans to enhance current kinetic kill capabilities with directed energy and other non-kinetic solutions. MDA is working with OSD and the Services to develop the technologies to support the development and integration of directed energy systems. In 2024, a directed energy Independent Assessment Team (IAT) completed an evaluation to incorporate directed energy into the Missile Defense System. Based upon recent Office of the Under Secretary of Defense for Research & Engineering-funded increases in electric laser power levels and projected increases to 500 kilowatt-class in 2 years, the IAT recommended that MDA fund a laser technology demonstrator. The Agency will initiate this effort with our Service partners beginning with long-range detect and track while technology continues to mature for the missile defense mission. We are also developing advanced sensors to improve position accuracy and range estimates of missile threats.

The NanoSat Testbed Initiative (NTI) is a collaborative, experimental approach leveraging commercial satellite platforms to mature technology and perform risk reduction for encrypted communications in a meshed network in space to support Service and Agency initiatives. Space Edge Experiments and Demonstration (SEED) is a small form factor, Commercial-Off-The-Shelf (COTS) processor that leverages artificial intelligence and machine learning (AI/ML). SEED will fly on the Space Test Program (STP)-H10 mission to the International Space Station. The Laser Communications Experiment (LaCE) will demonstrate the viability of a low-SWaP (increasing the power while reducing the size and weight) optical inter-satellite-link between two nodes in LEO as a method for secure and assured space-to-space communications.

MDA continues with Asymmetric Left Through Right-of-launch Integration (LTRI) activities to further enhance offensive-defensive integration and improve overall full

spectrum missile defeat capabilities. Asymmetric LTRI optimizes the efficiency and effectiveness of situational awareness between intelligence activities, offensive attack operations, and right-of-launch defenses. MDA has developed a medium fidelity model to simulate LTRI and is beginning to apply AI/ML to LTRI. MDA is collaborating with other government asymmetric multi-domain missile defeat efforts against ever advancing threats to optimize missile launch operations and provide data to inform decisionmaking in time critical situations.

MDA is partnering and cost sharing with the Department of Defense and Services to leverage sounding rockets and experimental hypersonic platforms to develop and mature key technologies for advancing hypersonic defense. These activities are the Multi-service Advanced Capability Hypersonic Test Bed (MACH-TB), High Operational Tempo for Hypersonics (H4H), and Hypersonic Test Bed efforts, and include maturation of key technologies such as axial upper stage throttling, secured meshed communications, survivable and optically optimal seeker windows, advanced materials characterization, hypersonic wind tunnel testing, and low cost, high yield thermal protection systems capable of surviving the harsh hypersonic environment.

MDA is actively engaging with Allies and international partners to leverage opportunities for collaborative development of missile defense S&T to advance capabilities in the areas of hypersonic weapons, integrated air and missile defenses, advanced sensing, battle management command, control and communications, directed energy, and AI/ML.

INTERNATIONAL PROGRAMS

Close collaboration with our Allies and partners is critical for addressing today's security challenges. MDA's international cooperation supports guidance outlined in the Missile Defense Review, Combatant Command priorities, and partner requirements. MDA actively and closely engages with multiple partners across the globe to build capability and interoperability against missile threats.

In the INDOPACOM region, MDA's most robust and wide-ranging cooperation is with Japan. In addition to the collaboration on glide phase interceptor development, Japan continues to acquire SM-3 Block IB and Block IIA interceptors via FMS. MDA is also executing an FMS case to provide the weapon system components and associated software for two Japanese-built Aegis System Equipped Vessels. MDA is working with 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 U.S. and other allied Integrated Air and Missile Defense capabilities. Finally, MDA conducts cooperative research and development projects and studies with Japan, Republic of Korea, and Australia.

In Europe, MDA is assisting the United Kingdom to develop requirements for its potential purchase of a persistent discrimination radar that will complement NATO missile defenses. MDA also has a number of ongoing cooperative research and development projects and studies with the Netherlands, Norway, Denmark, and the UK. Finally, MDA continues working closely with NATO by providing subject-matter expertise to the NATO Communication and Information Agency for the continuous testing and interoperability of BMD systems.

In the Middle East, MDA has a strong, long-standing relationship with the Israel Missile Defense Organization. Through this cooperation MDA provides \$500 million per year, and additionally any supplemental funding approved by Congress, for programs including Arrow, David's Sling, and Iron Dome—all of these systems have proven their value in Operation Swords of Iron. MDA has worked closely with our Israeli partners throughout this conflict to identify and assess areas where increased U.S. support would be beneficial. MDA's THAAD program is also a major asset for cooperation within U.S. Central Command's Area of Responsibility. Finally, MDA is leading a project to develop a regional missile early warning architecture for the Gulf Cooperation Council.

CONCLUSION

Chairman King, Vice Chairman Fischer, Members of the Subcommittee, we are committed to attracting and building a strong, skilled workforce that will continue to focus on providing what the warfighter needs to win today and tomorrow. 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 appreciate your continued support for MDA and the missile defense mission, and I look forward to answering the Committee's questions. Thank you.

Senator KING. Senator Fischer.

STATEMENT OF SENATOR DEB FISCHER

Senator FISCHER. Thank you, Mr. Chairman, and my apologies for being late to this hearing. I came from another meeting. Welcome to all of our witnesses. We appreciate you appearing before us today, and we look forward to hearing from each of you.

I am pleased to see progress being made on several programs over the last year, including continued development of the Missile Defense Agency's Hypersonic and Ballistic Tracking Space Sensor and the Next Generation Interceptor program.

However, I remain concerned that we are moving far too slowly on developing defenses against hypersonic weapons. In Section 1666 of last year's NDAA, this Committee directed the Department to achieve initial operational capability for the Glide Phase Interceptor Program not later than December 31, 2029. Yet the Missile Defense Agency's budget request included no funding for accelerating the development of the Glide Phase Interceptor. Instead, it pushed it out even further, and that is far too late.

I am also deeply concerned about the slow speed at which the Department is addressing recovery efforts from the rogue wave that devastated facilities at the Reagan Test Site in the Marshall Islands. We cannot allow critical testing capabilities for our nuclear deterrent and other long-range missile system to be undermined by a too-slow recovery.

I look forward to hearing more from our witnesses about these issues and about how the fiscal year 2025 request would impact their mission.

Thank you very much. Thank you, Mr. Chairman.

Senator KING. You all know me as a mild-mannered, reasonable guy, but I am not going to be mild-mannered today. The truth is we have no defense for hypersonic missiles. Yes or no? Mr. Hill, any defense on hypersonic missile? You are the commander of an aircraft carrier in the Greenland Gap. If a hypersonic missile launched from Murmansk, 6,000 miles an hour, what do you do?

Mr. HILL. We have some systems that defend in the terminal stage but we need more. You are correct, Senator King and Senator Fischer, that our hypersonic defenses are inadequate, and we do need—So SM-6 is in the Navy's terminal range. Patriot, I will let General Gainey speak to the specifics on that. Those are examples. But no argument—we need focus on hypersonic defenses.

Senator KING. So why are we talking about 2029 and even stretching that out. This is next year kind of stuff. I do not get it. I do not get your budget.

Mr. HILL. What we faced in this year, in the budget this year, it was a very difficult year, particularly with Fiscal Responsibility Act caps that we had to work with, with the must-pay bills that had to go in for the personnel, the salaries, the health care, inflation costs. When you get down to the point of what was left for the discretionary types of things, where you can really control your choices, you are focusing on trades between readiness—

Senator KING. That is your mission. Your mission is missile defense.

Mr. HILL. Yes. The budget decisions at the aggregate level are made at a higher level, and so you are trading off between readiness or your future investments.

Senator KING. Well, let me put the question in another way. Let's say what happened on April 14th happened over the Arctic Ocean, 300 missiles, drones, UAVs came across the Arctic Ocean toward Canada and North America. Could we do what Israel and we and other countries did? Could we knock down 99 percent of those missiles coming in, if that had happened in the northern part of the world?

Mr. HILL. If I may, that is in the realm of the responsibility of the Commander of NORTHCOM.

Senator KING. Okay. So, could we have done what happened on April 14th?

General GUILLOT. No, Chairman.

Senator KING. No. That is of concern. What is the gap? Is the gap interceptors? Is the gap sensors? How come they could do it over there and we cannot do it here?

General GUILLOT. Part of the reason, Mr. Chairman, is because they have the

[inaudible]. Up to the current time we have the capability in the services but they are not assigned to the NORTHCOM AOR.

Now also just the numbers of assets that we have in the region right now would not be sufficient to meet the attack of that size, that the Iranian forces—

Senator KING. In fact, our capability in the region is aimed toward North Korea. Is that not correct?

General GUILLOT. That is correct.

Senator KING. It is not designed to take on Russia or China, but that is where the threat is.

What is the cost of one GBI?

Lieutenant General COLLINS. So the GBI is approximately \$80 million, \$85 million.

Senator KING. One missile to intercept an incoming missile is \$80 million. Is that correct?

Lieutenant General COLLINS. Yes, sir. For an intercontinental ballistic missile class interceptor, yes, sir.

Senator KING. Well, in the Red Sea the Houthis are sending \$20,000 drones, and we are shooting them down with missiles that cost 4.3. The math does not work on that, gentlemen. I mean, it just does not work. What are we thinking?

Okay, here is what I am getting at. Your budget for directed energy is 1/1,000ths of your total budget. It has gone down from \$140 million a year to \$15 million a year. What in the hell are you guys thinking? Directed energy is the answer. It costs 25 cents a shot, and the budget has gone down from \$140 million to \$15 million a year. That is scandal. We cannot possibly defend ourselves with \$80 million missiles. There is not enough money in the whole world for that. Somebody give me an explanation of why, and I have got the data right here. In 2018, \$141.5 million for directed energy, fiscal year 2025, \$15.6.

Mr. HILL. Senator King, that is the portion of directed energy that is for the Missile Defense Agency. Across—

Senator KING. Is that not your business, missile defense?

Mr. HILL. Yes, but they have part of the missile defense piece. A lot of the air defense, a lot of what the directed energy supports, is actually done in the Army or in the Navy. There is a little over

\$200 million in directed energy programs, but I take the point that that is—

Senator KING. Well, that may not be enough. The budget for the entire Defense Department for directed energy is also down by something like two-thirds, and I do not get it, because we cannot go on hitting bullets with bullets, with very expensive bullets. Particularly we are talking about very expensive bullets hitting very cheap drones. Directed energy can do that. We know it can do that, and I do not understand. That directed energy budget should be going like this instead of like this.

Mr. HILL. Directed energy is a very important part. It has to be a very important part of missile defeat.

Senator KING. Well, I agree with you. The budgets are policy, Mr. Secretary, and the policy is directed energy ain't very important. It goes from \$140 million to \$15. That does not tell me the Department is valuing it very much.

So I will look forward to some further response, because right now we do not have much missile defense. That is the truth, whether it is to hypersonics, to drones. I would like you guys to go back and really rethink, what is your mission? If your mission is missile defense, we need to reorient what it is you do, and someday you will see me when I really mean it.

Vice Chair, go.

Senator FISCHER. Yes, sir. Yes, sir.

Senator ROSEN. He is fired up.

Senator FISCHER. Yes, we all are. We all are.

First of all, I would like to thank our military men who are here today. I thank you for the information you give us, not just at these open hearings but at our classified briefings, as well. You are open. You are honest about your needs. I will not put you on the spot here because you do serve the commander-in-chief. You serve the Secretary of Defense.

Mr. Hill, you are on the spot. I thank you for the work you do too, but when is this Administration going to listen to you, and to listen to the expert advice and information that our military gives them about what we need to defend the Homeland? We hear from constituents who are angry because we are not protecting our southern border, that we have chaos at the border. We just heard we have chaos everywhere when it comes to the security of our Homeland.

What is it going to take? Do not push it back, well, it is up to Congress to appropriate the money, it is up to Congress to set it. Because you are giving us your budget here and now. You are the ones presenting the budget with the advice of the military here with you. It is very upsetting knowing what we need and not being able to discuss it, so I thank you for your openness in this hearing, and your answers in this hearing, but what we need to have, and I hope the American people are listening.

With that, General Collins, as I noted in my opening statement this Committee has been very clear in our direction to accelerate the development of the Glide-Phase Interceptor system. If provided with additional resources, what steps would you be able to take to meet the congressionally mandated initial operational capability date of 2029?

Lieutenant General COLLINS. Thank you, Senator. Thank you, Vice Chairman. As we talked about just a second ago, the resource decisions may put us in a tough spot, in a tough decision on the GPI program.

Senator FISCHER. Yes, but if you had what you needed, can you reach it?

Lieutenant General COLLINS. With the design of the system and the way the system is set up and the technology maturation that we have playing out over the next 4 or 5 years, 2029, with the existing GPI plan, will be a very hard date to meet as we move forward. Very, very, very high risk program to do that.

But in that Section 1666, we were tasked to come up with options, and we are working with our industry partners, with our service partners, for options within the GPI program, and potentially outside the GPI program, to bring capability to bear against the hypersonic threat. We will incorporate that into that report and deliver that later this year, with option space and resource informed, ma'am.

Senator FISCHER. Thank you. General Gainey, I am concerned that the Army is not appropriately prioritizing disaster recovery efforts for the Reagan Test Site. We know that it is the linchpin of the development and testing of every long-range missile system of the United States, and we cannot afford further delays.

So what can we expect to see, or when can we expect to see a disaster recovery plan from the SMDC [Space and Missile Defense Command]?

Lieutenant General GAINNEY. Ma'am, thank you for that question, and thank you for highlighting Kwajalein Atoll, a strategic location to our Nation, and specifically in the Pacific. We have a great team out at Kwajalein. Team Kwajalein is doing amazing things, tight community, expertise in engineering and in very important mission.

We have moved significantly forward with the recovery ops. The challenge is not so much the recovery ops right now, because we are able to continue testing, and we will be able to perform our strategic testing. I will personally be out there in June for one of our testing events that will occur. It is the long-term infrastructure challenges on Kwajalein that we have to address. The rogue wave just highlighted a significant issue that had been building up over years, and now we have to prioritize and address those infrastructure challenges as we move forward, so we can provide the community for our soldiers, civilians, engineers that are out there doing a critical mission as we move forward.

Senator FISCHER. Do you have a plan in place right now to be able to address that?

Lieutenant General GAINNEY. We have a plan, and we, in the Army, are looking at command and control options, restructure options to more efficiently be able to get after the challenges on Kwajalein. Also we are looking at how can we do more at Kwajalein leveraging INDOPACOM and USARPAC as part of that strategic location, to help us build on that infrastructure out there to do more for the Pacific than it is doing now. That is how we are focusing, from an integrated approach.

Senator FISCHER. Thank you.

Senator KING. Before I call on Senator Rosen I just want to assure you, my comments were not in any way personal. You all are doing everything you can. But I think the agency needs to take a deep look at itself in light of what we have learned from Ukraine and from Israel and from developments in technology. Drones have become ubiquitous just in the last 3 or 4 years, and that is what I am hoping to get across in a somewhat intemperate way. But I wanted to make my point.

Senator Rosen.

Senator ROSEN. Well, that is good because you actually set me up for my next question, so thank you. You did not even know that, so thank you, Chairman and Ranking Member. I really want to thank you for serving. I guess all times are challenging, but we are in an especially challenging time.

I want to talk about some of the lessons that we have learned from Iran's attack on Israel. General Collins, the recent Iranian attack on Israel really did demonstrate how truly effective integrated air and missile defense systems can function to prevent a large-scale and layered attack. More than 300 missiles and drones we know launched against Israel, and an integrated system from numerous countries, including air partners in the region, were able to defeat the threat.

So I have kind of a multipart question. General, what lessons have we learned from the attack, and really, how complicated is it to establish a system that is able to foil the attack? How vulnerable is an integrated air and missile system to cyberattack? As we talk about being with multiple countries, and of course, are you budgeting for this in the future? Because as we said, the budget is the blueprint. We see what has happened.

How do we have to rethink that? I know I bundled a bunch there.

Lieutenant General COLLINS. Thank you, Senator, for that question, and it is a really important question. Integrated air and missile defense, as we have seen in Ukraine, as we see in Israel. The adversaries are throwing integrated air and missile offenses at us. We really do need to make sure that we have integrated air and missile defenses in place to defeat those.

It is a combination of a lot of different players. The Missile Defense Agency's main threat space is ballistic and hypersonic missiles. The service picks up the integrated AMD for air and cruise missile threats. Then we do need to bring all of those together with our coalition partners to bring that together.

Senator ROSEN. Right, because our DEFEND Act we passed a few years ago, my DEFEND Act, created this air and missile defense that clearly worked.

Lieutenant General COLLINS. Absolutely. Absolutely, and it worked very well. But it takes a long time to make it work right. General Gainey, in his opening comments, made some assertions about how much training and exercising and work we have done across the services and with our international partners to be able to demonstrate what happened that night.

It will take the architecture, the test and training, and the partnership to really bring true IMD to the forefront. It may have

looked easy. It was not easy to get there. It took a long time to get to what we demonstrated that night.

As part of that architecting, as part of that development, as part of the testing to do that, cyber has to be at the ground floor of any of these concepts as we move forward. Within the missile defense system we have a comprehensive cyber test program from the element up through the system before we get to the field. As well as looking to do cyber defense while in the field. That has got to be foundational to everything we do in the future, because that will be absolutely critical. If the enemy gets inside IMD, then the IMD is unsuccessful.

I am trying to remember the last part of your question.

Senator ROSEN. Are you forward thinking and forward budgeting? The budget is the blueprint, so we see what everyone is using, what the Chairman and Ranking Member have been talking about. How are you thinking about this for future budgets? What are you letting us know that we can put as a placeholder, develop? You name it. We have to take care of it.

Lieutenant General COLLINS. Yes, ma'am. I will answer one and then hand it to General Gainey. But one this is, at Missile Defense Agency we have the technical authority for IAMD, the technical design for the architecture, and we have spent a lot of time, over a decade, working on a future joint tactical integrated fire control architecture with the services, and we are demonstrating the future capability of how—

Senator ROSEN. The future is now, I am afraid.

Lieutenant General COLLINS. We just recently, at Project Convergence, Capstone 4, with the Army, demonstrated where we connected many assets from all the services together through a demonstration of this joint tactical management capability. We passed measurement-level data between an F-35 to a C-shooter. The C-shooter took a shot using F-35 threat data.

Senator ROSEN. That is great.

Lieutenant General COLLINS. So we are continuing to move that forward. That is an effort that is near and dear to me, to push this integrated forward.

I will hand it over to General Gainey with some thoughts.

Lieutenant General GAINNEY. Yes, ma'am, and thanks for your question. Thanks for the opportunity to be able to respond. From an Army perspective, I wear the Army hat but also wearing the Joint hat, IAMD, also.

But looking at the lessons learned I wanted to highlight earlier that we possess the capability to defeat a threat that we saw on April 14th. The work we have done with our partners and the work we have done from a joint perspective has helped us, and that was put on showcase on the 14th.

The way the Army is moving forward, with our modernization, right now Patriot system is our cornerstone system. However, as we modernize with IBCS and we have asked for funding, we are getting funding to be able to do that, we are now going to move to more of a layered, tailored approach to the threat. So if we get a threat strike like we saw on the 14th, we will be tailored to be able to provide tactical ballistic capability or cruise missile capa-

bility or even drone capability within that tailored force by the way we are budgeting, modernizing our capability moving forward.

So I am fully comfortable that the Army is taking those lessons learned and validates our path forward in modernization as an Army.

Senator ROSEN. Thank you very much.

Senator KING. Senator Rounds.

[Pause.]

Senator ROUNDS. Let me begin, General Guillot, based on our approach right now we have moved back into a near-peer competitor mode where we have two near peers. If you have to lay out for the American people what you see as the greatest threats that you have to defend against right now, share with me the vectors that you see these offensive weapons coming at us. What are the weapons that we are defending against today and that you are working on?

General GUILLOT. Senator, the range of weapons is greater than it has been at any time in the past, so starting with the North Korean threat and the intercontinental ballistic missiles is probably the longest-range threat that I look at each day. Next would be the cruise missile threats that are not only air-launched cruise missiles from Soviet bombers but also submarine-launched ballistic missiles that come from either coast, if the adversary submarines get close enough.

The cyber threat. The cyber threat is the most present and persistent threat that we see. We see it on a daily basis, attacks from nation states and hacktivists trying to get into our systems, each day.

Senator ROUNDS. What about drones?

General GUILLOT. Drones are certainly an increasing threat. We see them, on average, reported that are detected in the NORTHCOM AOR is anywhere from two to five a week over installations, military installations. That is the only visibility I have; I know there are certainly more over other parts of critical infrastructure.

Senator ROUNDS. Fair to say that our defense of the North American continent really has been based upon having the equipment to defend against the ICBM, number one, and to a lesser degree, the cruise missile, but until recently not a lot on drones because they are new, and not a lot with regard to cyber, except that which has moved through the system in the last 3, 4 years.

General GUILLOT. Senator, I think that is accurate.

Senator ROUNDS. If you take a look at the systems that we use to defend against them, these are very expensive weapons systems, are they not? The ICBM, the cruise missiles, and so forth are expensive, and really the equipment that we are using, our ability to shoot them down is with expensive systems, as the Chairman identified. But what we are really talking about here, with regard to ICBMs and cruise missiles, we are probably going to spend an expensive piece of machinery to catch up with them and take them out.

But what we are seeing coming across in the Middle East right now, and in the Red Sea area, we are not talking really about a

lot of ICBMs, but we are talking about cruise missiles, and we are talking about a huge number of drones.

We are using weapons that were never made to take those out. Is that a fair statement?

General GUILLOT. Yes, it is, Senator. To characterize what you said, we are using expensive weapons on UAVs, and to the cruise missiles. I think that directed energy, I think that laser, high-powered microwave capabilities, certainly for the UAVs, and even would have some capability against cruise missiles.

Senator ROUNDS. But the problem, as I understand it, is that we have not made that move yet. We have not moved—and this is where I am going to move to what the threat is there over to General Collins here for just a second. The systems that you work on today are principally equipment that, as the Chairman has indicated, are going to be some very expensive responses to take out ICBMs and cruise missiles. Is that an accurate statement, sir?

Lieutenant General COLLINS. Sir, our systems are designed against ballistic missiles, against ICBMs, but also against medium-range and short-range ballistic missiles. So the Aegis standard missile fleet, THAAD, those are also designed for regional area defense against theater ballistic missile class weapons. We do not cover down on cruise missiles.

Senator ROUNDS. What is the least expensive missile defense system aboard an *Aegis* carrier, or a Patriot system, what is the least expensive actual targeting material we have got, per shot?

Lieutenant General GAINNEY. Senator, if you are talking Army air and missile defense systems right now, it is probably our Stinger. But—and this is what I want to clarify here—the Joint Counter UAS Office is working the counter-UAS threat, and we have systems specifically developed for the counter-UAS, specifically the Coyote interceptor. Which is a significantly cheaper interceptor than a Patriot or an SM-2 type interceptor. We are using that capability successfully in theater right now, and that is what we are using to address that threat. That organization is continuing to develop technology, work with our industry partners. We have also been successful with directed energy, and we are also, in the Army, are fielding a platoon of high-powered microwave capability that will eventually be able to be deployed, which will continue to bring down the cost curve.

So the Army is really investing in directed energy, whether it is laser or high-powered microwave, and actually fielding it to the formation. So we have a directed energy, 50-kilowatt Stryker fielded to 4-60th ADA in support of First Armored Division, and we are fielding a platoon of high-powered microwave to 151 ADA support in 1st MDTF.

So those systems are real and out information right now, and some of them deployed.

Senator ROUNDS. And just to followup, because this is the part I think the Chairman was trying to make, is do you have enough in the budget right now to push those particular systems, and have they been budgeted for, or do you need your budgets improved to take advantage of those weapons systems?

Lieutenant General GAINNEY. I would definitely say we need to have more, based off of the threat and the numbers of threats that we are seeing. We will definitely have to have more.

Senator ROUNDS. How many of those weapons systems do you have today?

Lieutenant General GAINNEY. Total numbers?

Senator ROUNDS. Yep.

Lieutenant General GAINNEY. I can give you that number outside of this forum.

Senator ROUNDS. Classified?

Lieutenant General GAINNEY. Yes. I can provide you those numbers.

Senator ROUNDS. It is still in the development field, though?

Lieutenant General GAINNEY. No. That capability, it is a prototype and it has not gone to a full-rate production program of record yet, but it is about to in the next 2 fiscal years. Because what the Army is doing, we are talking that capability and we are putting it inside of our divisions. So the first division set with the counter-UAS capability is being fielded now, first two divisions, and the third division will start fielding in fiscal year 2026, where we will actually have Coyote-based Strykers with that capability on Strykers.

So the Army is moving forward as a program of record with this capability. It is not there now, but we are moving forward with it.

Senator ROUNDS. One last question, just directed back to General Guillot. Are you incorporating those in the North American Defense Command today?

General GUILLOT. We have requested to, Senator.

Senator ROUNDS. When you say you have requested to, what is the holdup on it?

General GUILLOT. Well, let me be clear. We have not requested Coyotes because of the kinetic capability in the homeland, but we have requested non-kinetic capabilities and directed energy weapons for counter-UAS.

Senator ROUNDS. You have requested them.

General GUILLOT. That is right. So the first one, Senator, as General Gainey mentioned, were pushed over to the AOR, were the CENTCOM area of responsibility. So we are watching closely the effectiveness there, and then as they learn and this system is proven, that is what I would like to employ here.

Senator ROUNDS. Thank you. Thank you, Mr. Chairman, for your indulgence.

Senator KING. Mr. Cotton. Senator Cotton.

Senator COTTON. You know, as I sit here and I listen to all this conversation about all the threats we face and all the inadequacies against those threats—it is great to hear all this talk of interceptors and directed energy systems—I cannot help but think maybe the easiest way to defend against all these missiles and drones would be to just blow them up on the ground before they ever get off, in warehouses or their assembly lines. I know none of you are in charge of these decisions. You all have in your title “missile defense” and “air defense” and “space defense,” and all the rest.

But I think under President Biden, the Department of Defense may take its name a bit too literally, if you look at what is happening in Yemen, for instance. All we are doing is shooting down

missiles and drones that are in the air, coming our sailors or on the launchpad, ready to launch. We are not actually trying to destroy all of their capabilities. I understand there are reasons for that. That we cannot necessarily find and fix them all right now, but that is a problem in its own right. So you might try to get on offense as a good defense, rather than just have our sailors as sitting ducks, like so many of our troops around the region are sitting ducks.

Speaking of sitting ducks, General Gainey, do you believe that the Army is providing adequate authority in a timely manner to unit to defend against drone attacks or surveillance?

Lieutenant General GAINNEY. Senator, thank you for that question. In CENTCOM AOR, yes. The great work—

Senator COTTON. Worldwide. Everywhere.

Lieutenant General GAINNEY.—the great work that has been done inside of CENTCOM has really set the stage to have globally relook the way we push authorities down. But that is obviously, Senator, as you know, because it is a conflict area, and missiles are being shot at our soldiers, so they have to have that authority delegated down.

Authorities in CONUS are a little bit more challenging, and—

Senator COTTON. What about PACOM?

Lieutenant General GAINNEY. That is within the area air defense commander's purview on how he delegates his authorities down to the actual operator to be able to shoot his capability, and he retains that authority based off of the risk analysis that he is doing.

Senator COTTON. What about—

Lieutenant General GAINNEY. he has the ability to pass that authority all the way down to the operator level, but he chooses to withhold it now, which is in his authority.

Senator COTTON. What about in Guam?

Lieutenant General GAINNEY. Same thing, because the area air defense commander inside of INDOPACOM is the PACAF commander, he also decides the authorities that are delegated to Guam, and he has the authority to delegate down further, if he chooses to.

Senator COTTON. It is my understanding that we have got quite a few drones flying over our installations on Guam, and there has been no genuine response. Is that the case?

Lieutenant General GAINNEY. I am not tracking no general response. It may be a challenge with where the capability is located on Guam, because most of the counter-UAS capability is localized, and I am not sure the situation of how it is—

Senator COTTON. Who would have the authority to engage drones over Guam?

Lieutenant General GAINNEY. It would be the local commander. We delegate the authority for drones to the local commander on that site, just because of the time and space you have to be able to delegate it too. So any discussions on delegation of authorities down even further to the operator would reside on Guam.

Senator COTTON. Okay. While we are on the topic of Guam, General Gainey and maybe General Collins, as well, if you want to chime in, what is the status of the environmental impact statements for the 20 Guam defense system sites?

Lieutenant General GAINNEY. As far as the impacts I will pass that to the Missile Defense Agency, who is doing the impact statements.

Lieutenant General COLLINS. Yes, sir. We are still in the middle of the environmental impact survey process. Our very first set of MILCON, military construction, money is in the fiscal year 2025, right now that EIS schedule on critical path. But we are on track to be able to award those MILCON contracts on schedule at the beginning of 2025.

Senator COTTON. You said you are in process. When did that process begin?

Lieutenant General COLLINS. Well before me. Probably over a 1½, 2 years ago, is when the process starts.

Senator COTTON. So 18 to 24 months ago, and it will not be finished for another 7 months, at least?

Lieutenant General COLLINS. Yes, sir.

Senator COTTON. That is bad for like a pipeline or a road, but that seems especially bad for air defense systems on one of our most critical forward deployed bases in PACOM.

That is all. Bad.

Senator KING. You go ahead. We will have a second round. Yes, we will have a second round.

Gentlemen, here is my problem, and I realize this is not in your level. This is Secretary of Defense, President, but high level of essentially allocation of resources. My problem is that Defense Department generally, research and development and construction of directed energy has fallen by 50 percent in the last 3 years, a little over \$1.6 billion to a little under \$800 million. Each of the services, the Army in those 3 years, has fallen from \$750 million to \$150 million. That is a pretty dramatic decrease.

My point is this is a major policy discussion, and we need to have it on our Committee, but I believe your agency has to have it as well. As I said before, what we have seen in the Middle East and what we have seen in Ukraine, it seems to me should cause some soul-searching within an agency whose name is "missile defense." Could we have done what the Israelis and we and the Arab countries did on April 14th? If the answer to that question is no, then we really have to go back and rethink.

Again, we are talking about \$80 million interceptors for ICBMs when, in fact, the more likely attack is going to come from air-launched cruise missiles, sea-launched missiles in the Arctic Ocean. You know, Sir Isaac Newton could tell you where an ICBM is going to go, but where a cruise missile, particularly a hypersonic cruise missile, is going to go is a very different problem that requires a very different solution, and economics also has to be part of it.

So I really believe that we need to have a Department-wide, and frankly on this committee we have to have a discussion about where we are going, because budgets are policy. We can talk about research and everything else, but if the budget has been cut in half, that tells me that this is not a priority for the Administration or for the Department of Defense.

So that is my comment. When a budget is cut in half that just tells me it is not very important.

Senator Fischer?

Senator FISCHER. Thank you, Chairman. Mr. Hill, in the fiscal year 2025 budget request the Missile Defense Agency requested \$1.2 billion for the defense of Guam. How would these funds be used to build out Guam's integrated air and missile defense architecture?

Mr. HILL. So we have initially the missile defense funds complement, as well, with the Army program. The Army is fielding programs, and General Gainey can comment in more detail on that, on the missile defense part. In particular, there is focus on—it is not the same, but using some of the launchers, the vertical launchers of that type, and you also have radar systems.

I probably should refer to General Collins for more specifics on that program, though.

Senator FISCHER. So are you coordinating not just with the Army but with other partners, as well?

Mr. HILL. The overall coordination for Guam, the acquisition, is actually an Army office that Congress wanted us to designate. We did. We designated the Army to lead that, rather than leading it from within an OSD office. Of course, that office is coordinating what Missile Defense Agency is doing and what Army, as well as what Navy is doing.

Senator FISCHER. Okay. Thank you.

Senator KING. Senator Rosen.

Senator ROSEN. Thank you. Well, I had some questions on Guam, too, so I am just going to kind of make a comment because we know the Chinese military has been so provocative in their plans to attack Guam. They have gone as far as releasing that commercial in September 2020, of their air force using their H-6 bomber to attack the island and the U.S. Forces.

So along with everyone else, I just want to make sure we are taking the adequate measures to deter our adversaries like China to secure Guam against these similar vulnerabilities that we have seen in the past. Particularly as we even go back to 1941, with Pearl Harbor. So how are you positioning things?

Mr. HILL. Senator Rosen, sometimes Chinese messaging is not very subtle, is it?

Senator ROSEN. No, it is not.

Mr. HILL. What we did in the missile defense review in 2022, was made a very clear statement that we wanted people to understand, yes, we can see China. You understand Guam is a very strategically important piece of the region. In the missile defense review we made a clear statement; it is also part of the Homeland of the United States.

Senator ROSEN. That is right.

Mr. HILL. Those are American citizens on Guam. They have been since 1950. So want you to understand that you are not just talking about any rock out in the Pacific. That is the United States. So that is part of the deterrence message with respect to China.

We have also always had the challenge that it has been within range of North Korean missiles, and that is why you have batteries there today. But as you are looking at that future larger question of the Indo-Pacific, if we are deterring war in the Indo-Pacific over time, this is where you are also trying to say the ability to project power from Guam is part of integrated deterrence. You will need

to assure that power projection from Guam, because you have missile defense to defend our projection, as a part of the overall architecture that is meant to deter really at the conventional level.

Senator ROSEN. Thank you, and that brings me to my last question, which is implementing the National Security Supplemental because, well, there is the Indo-Pacific and certainly there is Israel. So I am going to just really focus on Israel right now. We have \$4 billion for Iron Dome, David's Sling, \$1.2 billion for Iron Beam, which is Israel's directed energy missile defense system.

General Collins, how are we working to get the funds from the supplemental out the door and spent, with interceptors ready to be sent over to Israel so that they can defend themselves, and could you update us on implementation, General?

Lieutenant General COLLINS. Yes, Senator. Great question, and something that we have done a lot of homework ahead of time as the supplemental went through the process. We are going to follow the same process we followed a couple of years back when there was the billion-dollar Iron Dome supplemental in 2022, through a process called exchange of letters. Those letters are drafted. Those are now with the supplemental approval. Now we are taking those through final approval through all the government agencies that need to approve it. I do not have a timeline exactly yet of when that is expected to happen, but those are in work. We have had, from all the different agencies, State, Department of Defense, everybody, they have all been in and very cooperative, making sure we can get through this.

Senator ROSEN. We will look forward to seeing that. Thank you.

Senator KING. Final question. Why do we not have Iron Dome? We helped pay for it. We helped design it. Why do we not have an Iron Dome system throughout the country? It does not seem to be terribly expensive. It is proven to be fabulously effective. Why is that not part of our arsenal?

Lieutenant General COLLINS. Sir, I think I will start just once before I hand over to General Gainey, sir. In our cooperative agreements with Israel we did not pay for the co-development of Iron Dome. We co-produced Iron Dome. So we were actually not part of the design phase for Iron Dome. We were for David's Sling and Arrow weapon system as we go forward. I just wanted to clarify on the background there.

General Gainey, as far as utility?

Lieutenant General GAINNEY. Yes. Senator, thanks for that question. Actually, we did have Iron Dome for a period of time before we provided it back to Israel on loan for the recent conflict. So it was in one of our formations, 151 ADA, who actually trained with it, deployed it, and exercised it.

Senator KING. But can it be reproduced?

Lieutenant General GAINNEY. It probably can, but we, in the Army, our strategy is not so much a system. As I highlighted, the integrated battle command system, which is a C-2 system that integrates several launchers with several sensors to provide the optimal solutions—

Senator KING. Is the system you are describing as effective as Iron Dome?

Lieutenant General GAINNEY. It tested out just as effective. So as we implement it and field it in our formations we will field just launchers and not a complete system, which will provide the same capability because it will leverage the sensors that are already in those formations to provide a tailorable integrated solution for our Army.

Senator KING. Well, I want to thank you again. Today we have talked about a number of issues. I hope to reconvene this hearing in a classified setting, maybe several months from now, because I would like to discuss hypersonic defense. Because to talk about missile defense without realistically talking about hypersonic defense is not taking cognizance of the world that we live in.

But again I want to thank you all very much. It has been very informative. Thank you for the work that you are doing on behalf of our country.

The hearing is adjourned.

[Whereupon, at 5:56 p.m., the Subcommittee adjourned.]

**DEPARTMENT OF DEFENSE AUTHORIZATION
FOR APPROPRIATIONS FOR FISCAL YEAR
2025 AND THE FUTURE YEARS DEFENSE
PROGRAM**

TUESDAY, MAY 21, 2024

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

THE DEPARTMENT OF DEFENSE SPACE ACTIVITIES

The Subcommittee met, pursuant to notice, at 9:30 a.m. in room SR-222, Russell Senate Office Building, Senator Angus King (Chairman of the Subcommittee) presiding.

Subcommittee Members Present: King, Warren, Rosen, Kelly, Fischer, Rounds, Cramer, and Tuberville.

OPENING STATEMENT OF SENATOR ANGUS KING

Senator KING. The hearing of the Strategic Forces Subcommittee of the Committee on Armed Services is now in session. I want to thank our witnesses for joining us today, and I appreciate your service to the country.

The purpose of our hearing today is to examine the fiscal year 2025 budget of the Space Force. Mr. Hill, I understand that you are testifying on Space Force policy issues in lieu of Dr. Plumb, who has recently left us. I will want to know the actions that your office has taken to help lower the classification levels of space programs so that the warfighter can use them more effectively. Many of these programs are so highly classified that few, if any, can use them, prohibiting information sharing in a time of conflict.

Mr. Calvelli, you are responsible for the acquisition of space assets. In October 2022, you issued a memo on space acquisition tenets that outlined such commonsense objectives as don't launch satellites before the ground system to use the data is complete—pretty good advice; thank you—as well as efforts to hold the industry accountable for the systems that they build. I would like to know if you believe that those tenets are having an impact that you hoped that they would back in October 2022.

General Guetlein, this is year four of the Space Force as a separate title 10 service. If you look at the wall, your flag is there, along with the other service flags. Now that you are a title 10 service I hope that you can share with us how you are training to de-

fend our assets in space as well as to help the warfighter on the ground achieve their objectives if called upon.

For fiscal year 2025, the Space Force is requesting \$29.4 billion, which is a \$600 million decrease from the fiscal year 2024 request of \$30 billion. General Guetlein, it will be important to explain to the Committee in open session how this essentially flat budget, actually declining budget, is impacting your ability to train and equip our guardians to support the combatant commands.

Again, I want to thank our witnesses for joining us, and after our short opening statements we will have rounds of 5-minute questions of our witnesses.

Senator Fischer.

STATEMENT OF SENATOR DEB FISCHER

Senator FISCHER. Thank you, Senator King. Mr. Hill—are you correcting us?

Senator KING. Yes. He was correcting my pronunciation. GOOT-line. Sorry about that.

General GUETLEIN. Thank you, Senator.

Senator KING. I am sure I am not the first person to ever mispronounce your name.

General GUETLEIN. No, sir. I have grown up with that name and heard it every which way.

Senator KING. Thank you, sir.

Senator FISCHER. Secretary Calvelli, Mr. Hill, General Guetlein, thank you for being here today and for sharing your perspectives with this Subcommittee, and thank each of you for your service.

As this Subcommittee knows, our capabilities in space provide our forces with unparalleled communications, targeting, and intelligence. Every other service relies on Space Force capabilities to close the kill chain. Our adversaries know this, and space is no longer a safe haven. It has not been for years, and it has taken the Department far too long to openly acknowledge this.

The fact is we need to be investing more in both offensive and defensive space systems to counter our adversaries and safeguard our assets on orbit, and we need a space acquisition system that can do so effectively and quickly. I look forward to hearing about progress being made in space acquisition and what more can be done.

However, we cannot maintain space dominance unless we provide the Space Force with the resources needed to do so. I was disappointed by the President's Budget Request, but I hope to work with my colleagues on this Subcommittee and on the Appropriations Committee to provide funding for additional space systems, including one on General Whiting's unfunded priorities list.

Thank you, Mr. Chairman.

Senator KING. Mr. Hill, are you leading off?

STATEMENT OF JOHN D. HILL, DEPUTY ASSISTANT SECRETARY OF DEFENSE FOR SPACE AND MISSILE DEFENSE, DEPARTMENT OF DEFENSE

Mr. HILL. Thank you Chairman King and Ranking Member Fischer and distinguished Members of the Committee. Thank you

for inviting us to testify on the Department's fiscal year 2025 space budget.

We are clearly in a time of rapid change in the space strategic environment, one which does not favor the slow or those resistant to change. China and Russia are rapidly fielding space and counter-space capabilities to hold the Joint Force at risk and to deny us the space-based services on which we rely. The scale and scope of the threats in space present significant risks to the American people, to our national interests, to allies, and partners.

To meet these challenges, and working within the constraints of the Fiscal Responsibility Act, the President's Fiscal Year 2025 Budget Requests \$33.7 billion for space. Some of the critical investments include \$2.4 billion for National Security Space Launch; \$1.5 billion for more resilient positioning, navigation, and timing; \$4.2 billion for more resilient and protected satellite communications and the Space Development Agency's proliferated Low Earth Orbit (LEO) transport layer; \$4.7 billion to develop new missile warning and missile tracking architectures; and \$12.3 billion for a range capabilities to increase the resiliency of our existing architectures and protect our interests in space during competition, crisis, and conflict.

In addition to our space investments, the Department has made significant progress over the last 2 years on four key space strategy and policy priorities, which I have detailed at length in my written testimony. These are space control, space cooperation, space classification, and commercial space integration.

In short, we have obtained Presidential guidance to assure our space missions and to protect and defend the Joint Force from space-enabled attacks. We have significantly expanded our space cooperation with allies and partners, charting a path toward true combined operations in space that will strengthen our collective deterrence and defense. We have overhauled the Department's space classification policy to remove unnecessary barriers to information flow throughout the Joint Force and with our partners and with industry. We have released the first-ever Department of Defense Commercial Space Integration Strategy to harness the commercial sector's incredible innovation and to enhance our capability, capacity, resilience, and mission assurance.

Going forward, the Department will continue to press on all four of these lines of effort. I believe the progress we have already made together will pay dividends for years to come.

In closing, thank you again to the Committee for its partnership and for its tireless dedication to the Department and our servicemembers. I look forward to answering your questions.

[The prepared statement of Mr. Hill follows:]

PREPARED STATEMENT BY MR. JOHN D. HILL

INTRODUCTION

Chairman King, Ranking Member Fisher, and distinguished Members of the Subcommittee: Thank you for inviting me to testify before you on the Department's fiscal year 2025 space budget. I am honored to appear alongside Assistant Secretary Calvelli and General Guetlein. This written testimony closely follows the testimony of the Assistant Secretary of Defense for Space Policy before the House Armed Services Committee on April 30, 2024.

The world is clearly in a time of rapid change in the space strategic environment, one which does not favor the slow or those resistant to change. As the United States evaluates the current security environment, both the People’s Republic of China (PRC) and Russia are focused on rapidly fielding space and counterspace capabilities to hold our Joint Force at risk and deny us the space-based services on which our Joint Force relies. The President’s Space Budget Request of \$33.7 billion for fiscal year 2025—including \$25.2 billion in investments for procurement and research, development, test, and evaluation—will advance a wide array of space capabilities critical for continued access to the space-based services we rely on and to ensure the space domain remains safe, stable, secure, and sustainable. These investments will help protect the Joint Force and ensure our ability to operate in a contested and congested environment.

FISCAL YEAR 2025 SPACE BUDGET REQUEST

The President’s Fiscal Year 2025 Budget Request of \$33.7 billion for space strikes a balance among current warfighting needs, modernizing our architecture, and developing new capabilities to outpace our potential adversaries. This request includes approximately \$8.5 billion for military construction, military personnel, and funding for operations and maintenance. The budget request also identifies \$25.2 billion in investments in resilient architectures, space command and control, integrated space fires and protection capabilities, modernized and agile electronic warfare architecture, enhanced battlespace awareness and space systems defense, and a range of capabilities designed to enhance our space control. Important investments for the Department include:

- \$2.4 billion for National Security Space Launch, which will procure 11 launch vehicles to provide assured access to space and will modernize space launch ranges to support increased commercial use.
- \$1.5 billion for more resilient positioning, navigation, and timing (PNT) and Global Positioning System (GPS) III Follow-On satellite support, including procurement of two GPS III Follow-On satellites and Next-Generation Operational Control System (OCX) development.
- \$4.2 billion for a resilient protected tactical, wideband, and narrowband communications architecture and the Space Development Agency’s proliferated low Earth orbit (pLEO) transport layer development.
- \$4.7 billion to develop new proliferated Resilient Missile Warning / Missile Tracking architectures and Next-Generation Overhead Persistent Infrared (OPIR) space and ground architectures.
- \$12.3 billion for a range of capabilities to increase resilience of existing architectures and to enable us to protect our space interests during competition, crisis, and conflict.

While the depth and breadth of space threats continues to rapidly expand, we can only meet these challenges through strong and sustained investments in our space capabilities. The Department cannot operate effectively or efficiently under repeated continuing resolutions. I urge Congress to ensure the timely passage of appropriations for Fiscal Year 2025.

SECURITY ENVIRONMENT

People’s Republic of China (PRC)

According to the Office of the Director of National Intelligence’s (ODNI) 2024 Annual Threat Assessment (ATA), China will probably have achieved “world-class status in all but a few space technology areas” by 2030. The PRC views the space domain, and the ability to deny space to PRC adversaries, as a critical component of modern warfare. The PRC has made significant investments in space systems to rapidly expand its ability to monitor forces across the globe, improve its long-range precision strike capabilities against U.S. and allied forces, and deter or deny outside regional intervention. To advance its concept of “informatized” warfare, the PRC continues to develop and modernize space capabilities to conduct intelligence, surveillance, and reconnaissance (ISR) and to enhance communication, data relays, and PNT for its forces. The PRC also continues to rapidly develop counterspace capabilities to hold our on-orbit assets at risk. These capabilities include electronic warfare systems, direct-ascent anti-satellite missiles, directed-energy systems such as ground-based lasers, potential space-based kinetic weapons, and orbiting space robots. To support its increased investment in space, the PRC is modernizing its launch capabilities and capacity to reconstitute its space capabilities if needed.

Russia

Russia is seeking to mitigate U.S. spacepower by developing a range of offensive counterspace capabilities, including electronic warfare, directed energy weapons, direct-ascent anti-satellite missile systems, and orbital systems with counterspace applications. Russia's investments in counterspace systems are designed to exploit what Russia views as United States overreliance on space for conducting military operations and to offset perceived United States Military advantages. As noted in the ODNI 2024 ATA, Russia will be more reliant on counterspace capabilities as it rebuilds its ground force from extensive losses in its war against Ukraine. Russian military doctrine embraces multi-domain attacks, using both reversible and irreversible capabilities, to target adversary satellites. Russia has conducted cyber intrusions against commercial satellite communication networks, and Russia has demonstrated through both public statements and actions that it views commercial satellites providing space-based services to Russia's adversaries as potential targets. Russia is also developing a concerning anti-satellite capability related to a new satellite carrying a nuclear device. The Department is extremely concerned that Russia may be considering the incorporation of nuclear weapons into its counterspace programs, based on information we deem credible. The United States has been aware of Russia's pursuit of this sort of capability dating back years, but only recently have we been able to make a more precise assessment of their progress. This capability could pose a threat to all satellites operated by countries and companies around the globe, as well as to the vital communications, scientific, meteorological, agricultural, commercial, and national security services humanity depends upon.

Democratic People's Republic of Korea (DPRK)

The DPRK is a persistent threat and source of continuing provocations to both the United States and our allies and partners. The DPRK continues to pursue its space program, conducting several reconnaissance satellite launch attempts over the last year in violation of multiple U.N. Security Council resolutions related to DPRK use of ballistic missile technology. The DPRK also maintains previously demonstrated non-kinetic counterspace capabilities, including systems for jamming communications and GPS signals.

Iran

Iran is continuing to develop its space program. In February, Iran used Russian launch services to place communications and navigation satellites into orbit. Iran has also publicly acknowledged its capabilities to jam satellite communications and GPS signals. Its continued development of space launch vehicles (SLV), such as the Simorgh, would shorten the timeline to produce an intercontinental ballistic missile, if it decided to develop one, because the systems use similar technologies.

Growing Use of Commercial Space Services

The advantages of space-based services are no longer exclusive to nations with indigenous space programs. Many space services are now commodities; for instance, satellite communication services and readily available, highly detailed satellite imagery can be procured by nascent space-faring nations and non-State actors alike. The Department greatly benefits from the innovation of our commercial space sector. We also recognize that our adversaries and competitors will seek to exploit satellite imagery, data, communications, and other commoditized services through illicit means and through commercial entities and avenues beyond U.S. regulatory regimes. In this respect, space-based services are no different from goods and services in sectors across the economy.

SPACE STRATEGY AND POLICY INVESTMENTS

The space domain is critical to U.S. national security and essential to all four of our National Defense Strategy's priorities. Our Joint Force relies on space-based services every day to conduct operations and likewise relies on space control capabilities to protect itself from space-enabled attack.

Our competitors recognize the importance of space to the United States, and they continue to develop and field counterspace capabilities designed to deprive us of the advantages of space during conflict.

Over the last 2 years, in partnership with Congress, the Department has made significant progress on four key space strategy and policy priorities: space control, space cooperation, space classification, and commercial space integration. To maintain our advantage in space, the Department will continue to press on these four priorities.

Space Control

In 2022, at the request of the President's national security advisor, the Department worked with the Intelligence Community to conduct the Space Strategic Review (SSR). This extensive effort baselined the entire national security space community on our overall space posture and where we need to head. Our analysis confirmed that China is the Department's pacing challenge in the space domain, and that space is in fact an operational domain where we must defend our national security interests and counter space-enabled threats. In June 2023, the President approved the Space Security Guidance, affirming the SSR's recommendations.

As we implement that guidance, our primary means of deterring in space will be through resilience. The Department continues to adopt resilient-by-design architectures through a range of approaches, including disaggregation, distribution, diversification, proliferation, and protection. One way we are increasing the resilience of our space capabilities is through the Space Development Agency's proliferated satellite architecture. In April 2023, the Department launched the first 10 satellites of the Proliferated Warfighter Space Architecture, followed by an additional 13 satellites 5 months later. This was accomplished in less than 3 years from contract award to launch, an accelerated timeline made possible by leveraging commercial satellite bus lines and existing technologies. This architecture will enhance and support no-fail missions such as networked communications, missile warning, missile tracking, and missile defense.

But resilience alone is insufficient to provide mission assurance or to deny adversaries' uncontested use of space in conflict. The Space Security Guidance made clear that the United States will defend space systems, and we will protect and defend our men and women in harm's way from space-enabled threats, just as we do for threats they face in and from land, sea, and air. This may require the Department to take action to ensure that our potential adversaries are unable to rely on their space systems to find and strike U.S. and allied forces. As part of the U.S. Government's integrated deterrence strategy, the United States may leverage counterspace options across all operational domains if necessary. In doing so, the Department will continue to be a leader in the responsible use of space to ensure that the domain remains safe, stable, secure, and sustainable.

The Department continues to advance our Tactically Responsive Space capabilities to support integrated deterrence and warfighting needs. Last September, the Victus Nox mission successfully launched, with 24-hour notice, showcasing our ability to rapidly respond to emerging situations as well as highlighting the benefits of leveraging commercial systems, capabilities, and services. A new tactically responsive space mission, Victus Haze, will exercise a realistic threat response scenario in an on-orbit space domain awareness demonstration. That launch is planned for late-2025.

In developing and, if necessary, using our capabilities to protect the Joint Force, we will ensure that space is safe, stable, secure, and sustainable so that everyone may benefit from using space for peaceful purposes. We do not make that commitment lightly. The Department is leading by example and adheres to the Secretary's Tenets of Responsible Behavior in Space, which include limiting generation of long-lived debris, operating in a professional manner with due regard to others, and avoiding the creation of harmful interference.

The Department also supports this Administration's work to advance national security norms in space through the United Nations (UN), including our commitment not to conduct destructive, direct-ascent anti-satellite missile testing. We also supported this year's United States-Japan co-drafted U.N. Security Council resolution, which would have reaffirmed the obligation not to place in orbit around the Earth any objects carrying nuclear weapons, or any other kinds of weapons of mass destruction. Concerningly, Russia vetoed that resolution.

Our approach is in stark contrast to the behavior of our competitors. In the past 20 years, both Russia and China have irresponsibly and destructively conducted debris-generating direct-ascent anti-satellite missile tests. And even while both countries continue to develop, test, and deploy weapons on-orbit, they simultaneously promote at the U.N. hollow, unverifiable treaties against the weaponization of space. At the same time Russia and the PRC refuse to join dozens of others in committing to an actual norm of responsible behavior: not to conduct destructive direct-ascent anti-satellite missile tests. No one wins if space is overrun by debris. We continue to call on our competitors to demonstrate their commitment to preserving space as a safe, stable, secure, and sustainable domain.

Space Cooperation

The U.S. network of allies and partners is an asymmetric advantage that our competitors cannot match. Through space cooperation with our allies and partners, we

broaden the number of systems collectively available for space operations, both on orbit and on the ground; strengthen resilience; expand our options for diplomatic and military responses; and complicate an adversary's decisionmaking. The Combined Space Operations (CSpO) Initiative, a group of defense representatives from likeminded nations, continues to be the premier forum for civilian and military national security space leadership to work toward shared goals. In December 2023, the CspO Initiative Principals Board welcomed representatives from Italy, Japan, and Norway as new members of the body, joining representatives from Australia, Canada, France, Germany, New Zealand, the United Kingdom, and the United States.

The Department is also investing in bilateral space cooperation around the globe. Last year, my team conducted the first bilateral space cooperation dialog with the Indian Ministry of Defense. We advanced discussions with our Japanese partners on finalizing our unique space domain awareness hosted payload partnership. United States-Norway collaboration enabled the integration of United States payloads on two Norwegian satellites to provide 24/7 protected satellite communications for forces operating in the Arctic. The Department has been, and will continue to be, committed to expanding space cooperation to enhance information sharing, set standards for interoperability, promote responsible behavior, and develop combined operations in space.

But space cooperation is not only about working with allies and partners. It is also an important tool we use with our competitors to navigate challenging issues, avoid misunderstandings, and maintain stability. Since President Biden's summit with President Xi last year, my team has been part of bilateral exchanges with their Chinese counterparts on space security. Both the United States and China have a vested interest in a safe, secure, stable, and sustainable space domain, and both sides will benefit from continuing to talk. The United States and China conducted an initial consultation on bilateral arms control and nonproliferation in November 2023, which included a discussion of space security issues. Since then, the United States has sought a substantive response from the PRC on concrete ways to reduce strategic risk, including instituting bilateral pre-notifications of strategic ballistic missile test launches or adopting measures to deconflict activities in space. Unfortunately, the PRC has declined a follow-on meeting and has not provided a substantive response to our suggested options.

Space Classification

Our ability to work closely with allies and partners in the space domain, and our ability to use our space capabilities to protect and defend the Joint Force, requires the right information getting to the warfighter at operationally relevant speeds. But that information flow continues to be significantly hampered by the overclassification of space activities.

In coordination with Defense and Intelligence Community stakeholders, my team spent more than a year completely rewriting a 20-year-old legacy space classification policy, which reflected priorities of a different time and a different security environment. That legacy policy limited our ability to share information within the Department, limited our ability to cooperate with our allies and partners, and limited the ability of our industry partners to provide cost effective and timely solutions to difficult problems. Ultimately, it limited our ability to adequately plan and train for conflict as we must in this era.

In December 2023, Deputy Secretary Hicks approved our entirely new space classification policy. Across the Pentagon, there is now a concerted effort to implement that policy and decrease the siloed nature of space activities. The Military Services are reviewing programs to reduce their classification to a level that benefits the warfighter. And we are leaning forward on how much we can share with our allies and partners, including industry, to allow more meaningful cooperation.

Our goals are to enable better integration of space in joint and combined operations, ensure that classified capabilities are accounted for in war plans and exercises, and still maintain protections for information appropriate to today's needs. Over time, the new policy should dramatically improve information flow and reduce the time and money required to build future systems.

Commercial Space Integration

Just last month, in April 2024, the Department released its first-ever Commercial Space Integration Strategy. Shortly after, the U.S. Space Force released a service-level strategy, nested under the broader DOD document. This marks a new effort to harness the remarkable innovation of the commercial space sector to enhance our resilience and strengthen integrated deterrence.

To protect our men and women in uniform and ensure the space services they rely on will be available when needed, the Department has a responsibility to leverage all tools available. That includes commercial solutions.

From more mature capabilities such as launch, space domain awareness, and satellite communications, to emerging capabilities such as on-orbit mobility and logistics, the commercial sector's ability to innovate, scale production, and rapidly refresh technology is opening the door to all kinds of possibilities.

Our National Defense Strategy directed the Department to increase collaboration with the commercial space sector and leverage its technological advancements and entrepreneurial spirit. The Department's new Commercial Space Integration Strategy and the U.S. Space Force's companion Commercial Space Strategy follow through on that directive.

The degree to which commercial space capabilities and services can benefit U.S. national security will ultimately be measured by how well the Department can actually integrate commercial solutions into the way we operate, not just in peacetime, but also in conflict. To accomplish this, as Secretary Austin wrote in the foreword to the strategy, the Department needs "to eliminate the structural, procedural, and cultural barriers to overcoming legacy practices and preconceived notions of how the commercial sector can support national security."

Over the last year, my team engaged directly with space stakeholders across the Department, with interagency partners, and with commercial space entities of all sizes. We hosted roundtables, tabletop exercises, and informational sessions to better understand how commercial space solutions could support the Department, while also accounting for the commercial sector's interests. Informed by that body of work, our new strategy directs the Department to pursue four lines of effort for commercial space integration: (1) ensure access to commercial space solutions across the spectrum of conflict; (2) work to achieve integration prior to crisis; (3) establish the security conditions necessary to integrate commercial space solutions and help commercial providers reduce risk; and (4) support the development of new commercial space capabilities that have the potential to support the Joint Force.

This is an important new effort that leverages American ingenuity to enhance the resilience of our national security space architecture and strengthen deterrence. The strategy is deliberately unclassified to be transparent about what we need to achieve, and to hold ourselves accountable for what we have committed. I am confident it will pay dividends for the Department for years to come.

CONCLUSION

Space capabilities are essential to overall military effectiveness and central to the Department's integrated deterrence strategy. As we contend with a dynamic security environment, the Department remains committed to making critical space investments to deter our competitors and prevail in conflict should deterrence fail.

Thank you to the Subcommittee for your tireless dedication to the Department and our servicemembers, and for the opportunity to come and speak with you today. I look forward to answering your questions.

Senator KING. Mr. Calvelli. Secretary Calvelli.

STATEMENT OF THE HONORABLE FRANK CALVELLI, ASSISTANT SECRETARY OF THE AIR FORCE FOR SPACE ACQUISITION AND INTEGRATION

Mr. CALVELLI. Chairman King, Ranking Member Fischer, and distinguished Members of the Subcommittee, thank you for inviting me to testify before you today.

With the growing threats in space we must continue to transform our space architecture to be more proliferated and more resilient so that it can always be counted on during times of peace, crisis, or conflict. As the Service Acquisition Executive for Space, I am focused on two things: driving speed in our acquisitions and delivering programs on cost and schedule. I would like to highlight some of the progress we have made since I testified before this Committee last year.

Since the spring of 2023, the Space Development Agency has delivered 27 satellites to orbit, nearly all of them in around 3 years

from contract award. This includes 8 new missile warning/missile tracking satellites and 19 data transport satellites. With these systems, we have been able to demonstrate the first-ever Link 16 network connection from space, a capability that will allow warfighters to extend beyond-line-of-sight messages.

The Space Rapid Capabilities Office completed and is in the process of fielding the first 11 of 24 low-cost, transportable, terrestrial satellite communications jammers. These jammers went from contact award to fielding in about 18 months. Additionally, last June, Space RCO completed an on-orbit testing of its enhanced threat awareness payloads, and delivering those payloads to the Space Force programs to use.

Meanwhile, the Space Systems Command (SSC) continues to make outstanding progress toward modernizing both our missile warning and military satellite communications architectures to be more resilient. Space Systems Command launched the first Weather System Follow-on Microwave satellite last month to support the pivot to a more resilient, disaggregated, hybrid weather architecture to meet warfighter requirements.

Last September, Space Systems Command's Tactically Responsive Space mission, known as VICTUS NOX, demonstrating the ability to go from factory floor to on-orbit operations in less than 5 days.

Since April 2023, there have been 7 national security space launches that delivered critical warfighting capabilities to orbit.

SSC is also adding resilience through allied partnerships. For example, they delivered two enhanced polar system payloads, which will be hosted on Space Norway satellites that will be dual-launched this July, providing protective satellite communications in the Arctic region. Space Systems Command even broke ground last summer, in Australia on the Deep Space Advanced Radar Capability Site 1, and will award design contract for Site 2 this summer with the United Kingdom. This partnership with Australia and the U.K. is critical to our space demand awareness mission.

We are also continuing to take advantage of strong space industrial base, including awarding contracts to many nontraditional space companies and implementing our recently published Commercial Space Strategy.

Simultaneously, we are aggressively tackling challenging programs to get them over the finish line. We are focused on delivering the GPS Next-Gen Operational Control Segment, also known as OCX, and making significant progress toward getting the system ready to transition to operations in 2025.

Another one of our challenging programs, ATLAS [Advanced Tracking and Launch Analysis System], has made significant progress. The program is on schedule to incrementally deliver space demand awareness command and control capabilities next year to enable finally the decommissioning of the legacy SPADOC [Space Defense Operations Center] system.

We have also proven now that we can build small satellites quickly. However, as we begin to deliver the next tranche of SDA [Space Development Agency] satellites this fall, getting the military services to adopt and use these satellites will be a key success to our systems. Likewise, our ability to maintain a short access to

space for our space capabilities remains paramount, and launch providers must be ready to scale to meet the increased demand.

We are also working to move programs out of Special Access Program stovepipes, thanks to DOD's Space Classification Policy update this past December. This will improve our ability to integrate spaces for other domains and enable better sharing with our allies.

Overall, we are doing a lot by simultaneously transforming our space architecture to make it more resilient, and at the same time investing in those protect-and-defend missions that we need to do to guarantee the advantage we get from space and protect the Joint Forces.

As we continue to drive speed into our acquisitions, our job and our top priority as acquisition professionals is centered around program execution. Simply defined, it means delivering programs on cost, on schedule, that work. We are taking a special interest in making sure that up front, when we develop our action strategies and RFP documents, or request for proposal documents, that they are realistic and executable, that we implement source selection strategies that lead us to awarding contracts with achievable cost and schedule baselines, and to a contractor with the right expertise, skills, and staff to do the job, and then once under contract, relentlessly managing the program based on the daily basis to ensure we deliver on cost and on schedule. Given the threats and increased capabilities of our competitors, it is critical that we deliver programs on cost and schedule, and this is a key focus area for me.

Thank you to the Subcommittee for all your support. I look forward to your questions.

[The prepared statement of Mr. Calvelli follows:]

PREPARED STATEMENT BY HONORABLE FRANK CALVELLI

OVERVIEW

Chairman King, Ranking Member Fischer, and distinguished Members of the Subcommittee, thank you for inviting me to testify before you today.

We continue to face an unprecedented strategic competitor in China, and our space environment continues to become more contested, congested, and competitive. We have seen exponential growth of in-space activity, including counterspace threats, and our adversaries would seek to deny us the advantage we get from space during a potential conflict.

To counter these threats, we continue to drive resiliency and transform our space architecture through proliferation, orbit diversification, disaggregation, utilization of commercial capabilities, cyber hardening, and collaboration with Allies and partners. Furthermore, my top initiative remains to drive speed into our space acquisitions and deliver programs on cost and schedule. The threat environment demands we deliver capabilities fast enough to detect threatening behavior in space, deny adversary advantage, deter aggressive actions, and, if necessary, defeat adversaries during a conflict.

Today I want to talk to you about how we are transforming the space architecture, the near-term capabilities we are delivering, the remaining challenges, and how I am managing the space acquisition enterprise to drive change and get after the threat with speed.

CONTINUING TO TRANSFORM THE SPACE ARCHITECTURE

The Space Force continues to pivot to a proliferated and resilient missile warning and missile tracking (MW/MT) architecture in low Earth orbit and medium Earth orbit (MEO) that focuses on tracking advanced threats by integrating critical missile tracking capabilities that previously did not exist. As we develop and deliver this new capability, we are also developing the Next Generation Overhead Persistent Infrared (OPIR) program, comprised of the Next Generation OPIR Geosynchronous

(Next Gen GEO) and Next Gen OPIR Polar missile warning systems, as a bridge to enable the eventual transition to the resilient MW/MT architecture.

We continue to transform our military satellite communications (SATCOM) by disaggregating our strategic and tactical satellite architectures and leveraging new proliferated LEO capabilities. This approach adds resiliency and ensures our systems can operate through contested and degraded environments.

In collaboration with the National Reconnaissance Office (NRO), we are developing a ground moving target indicator (GMTI) solution to meet Combatant Command requirements. This capability will provide actionable information on adversary surface targets that the Space Force will deliver to the Joint Force. We selected this partnership with the NRO because their concept allows us to go faster, with less technical risk, and at lower cost. Again, acquisition speed is a top factor in our decisionmaking, and the partnership with the NRO allows us to develop space-based GMTI faster. Milestone B for this program will take place later this year.

Maintaining constant awareness of the battlespace, supplemented by the capability to accurately produce indications and warnings for malign behavior, is critical to the Space Force avoiding operational surprise. To that end, our space domain awareness architecture leverages partnerships and data across the national security space enterprise and commercial sources to ensure we have a resilient, integrated, and diverse sensor architecture. We continue to invest in SILENTBARKER and the Deep Space Advanced Radar Capability (DARC).

The DARC program exemplifies international collaboration within the trilateral partnership agreement between the United States, the United Kingdom, and Australia, known as AUKUS. Earlier this year, we broke ground on DARC Site 1 at Harold E. Holt Naval Station, Australia.

DARC extends the Space Force's umbrella of awareness in the space domain by establishing a clear picture of the operating environment and denying adversaries the ability to strike U.S. assets without warning. This summer, the DARC Site 2 design contract will be awarded for the planned United Kingdom location.

While awareness of the battlespace is critical, the ability to deny or defeat threats in, from, and to space is paramount. We are investing in classified programs that include capabilities to counter an adversary from using space to attack the U.S. Homeland or the Joint Force. These investments, which cannot be discussed in detail in an unclassified setting, are fundamental to ensuring space superiority.

Maintaining assured access to space is vital to delivering capabilities to orbit when needed. With the growing launch demand and number of emerging launch providers, we designed the National Security Space Launch (NSSL) Phase 3 strategy to pursue, for the first time, a dual-lane hybrid contracting approach to maximize access to commercial launch partners.

Lane 1 in NSSL Phase 3 allows an unlimited number of launch service providers to compete for our less complex missions that have higher risk tolerance. Lane 1 enables us to tap into new technologies as emerging providers and capabilities are ready. Lane 2 maintains our full mission assurance posture to support our toughest missions. While Lane 2 closely mirrors the current procurement approach in NSSL Phase 2, we added a third launch provider to promote the necessary resiliency in launching our most challenging and critical payloads.

DELIVERING CAPABILITY

In February 2024, the Space Force's Space Development Agency (SDA), in partnership with the Missile Defense Agency (MDA), successfully launched the final four Tranche 0 Tracking Layer satellites of the Proliferated Warfighter Space Architecture (PWSA) together with MDA's two Hypersonic and Ballistic Tracking Space Sensor satellites. This collaboration will enable simultaneous testing of SDA's MW/MT sensors with MDA's fire control sensors on the same exercise targets, from the same orbit, and deliver the quality data required to analyze and defeat advanced missile threats. Furthermore, this launch marked the final delivery of SDA's Tranche 0 constellation, culminating 27 total satellites delivered to orbit in nearly 3 years from contract award.

Later this year, SDA will start delivering roughly 160 Tranche 1 satellites over 10 launches in 11 months. SDA's vendors are currently building all Tranche 1 satellites and the accompanying ground infrastructure, including two new network operations centers that are on track for delivery later this year.

Not only are we demonstrating our ability to develop and proliferate with speed, but we are also introducing non-traditional prime vendors in Tranche 2. Incorporating new industry partners enhances our resiliency and increases our advantage against strategic competitors. These new vendors also demonstrate an encouraging

industrial base response to our spiral development model of competing new tranches every 2 years.

We also kicked off this year with the successful first certification flight of United Launch Alliance's (ULA) Vulcan Centaur launch vehicle. This marks an important milestone on our path toward ending United States reliance on the Russian-made RD-180 engines that are used on Atlas V launch vehicles. The last Department of Defense (DOD) Atlas V launch is scheduled for this fall.

Fiscal year 2024 marked the final order year of NSSL Phase 2 and supports launches through 2027. We will award our NSSL Phase 3 contracts this year for launch service orders beginning in fiscal year 2025.

This April, Space Systems Command launched the first Weather System Follow-on Microwave (WSF-M) satellite. WSF-M is designed to replace the critical microwave capabilities of our legacy Defense Meteorological Satellite Program satellites which will reach end of life in 2026. WSF-M is equipped with a microwave imager to collect weather data such as ocean surface vector winds and tropical cyclone intensity, as well as snow depth, soil moisture, and sea ice characterization. This launch marks a critical step toward improving the collection of weather data in support of warfighter requirements.

In the same month, the Evolved Strategic SATCOM (ESS) program released its request for proposals (RFP) for the constellation's initial four satellites. ESS is the future backbone for Joint All-Domain Nuclear Command, Control, and Communications, and will replace Advanced Extremely High Frequency system services to provide global, integrated, survivable, resilient, and dynamic ground and satellite communications for assured strategic endurance. Contract award is targeted in fiscal year 2025 to achieve Initial Operational Capability (IOC) by 2032.

We continue our commitment to provide highly accurate timing, three-dimensional positioning, and navigation information, in any weather, to an unlimited number of military and civilian users, anywhere on or above the surface of the Earth. In fiscal year 2025, we are procuring two additional Global Positioning System (GPS) IIF vehicles. Currently, there are 31 GPS satellites in operation, and another four in storage. Simultaneously, we are researching additional resilient positioning, navigation, and timing options, which may become a transformational effort in the future.

Another critical capability launching this year is Geosynchronous Space Situational Awareness Program (GSSAP). GSSAP remains our hallmark program for space domain awareness. It is imperative we get this capability on orbit to support our warfighters by the end of the year.

Additionally, the Ground-Based Optical Sensor System program is on track to deliver upgrades to the Ground-Based Electro-Optical Deep Space Surveillance system at the White Sands Missile Range and Maui sites in fiscal year 2025 and fiscal year 2026, respectively. These upgrades, which include replacement of legacy optics, camera hardware, and software, are projected to allow the sites to make valuable space domain awareness contributions for the next 20 years, and will enable increased sensitivity and improved search rate, accuracy, and throughput.

To ensure our warfighters can count on space capabilities throughout the spectrum of conflict, we must maintain robust cybersecurity and cyber defense. As an example of cyber defense, we recently awarded a new task order for Defensive Cyber Operations—Space, consolidating and centralizing the current contracting vehicles to provide improved terms and cost control, and enhancing our cybersecurity posture and resilience.

CHALLENGES

Transforming the space architecture to combat the threat requires us to deliver warfighter capabilities on cost and schedule. Some challenging legacy programs remain, but we are aggressively managing these programs to ensure they deliver.

The three long-standing troubled programs, GPS Next Generation Operational Control Segment (OCX), Advanced Tracking and Launch Analysis System (ATLAS), and Military GPS User Equipment Increment 1 (MGUE Inc 1), need to get over the finish line.

OCX continues to be a challenging program. OCX is a prime example of the difficulty in tackling complex satellite command and control (C2) systems and extremely large software development all at once, a practice I am working to ensure is not repeated in the future. We are anticipating government acceptance of OCX later this year and completing the final Acquisition Program Baseline (APB) milestone of Ready to Transition to Operations in spring 2025. We are getting close to completing the baseline effort and need Congress' support with stable funding to ensure OCX can deliver.

ATLAS has made significant progress since we broke the program into more manageable deliverables. The program is now on schedule to deliver capability by September 2025 that, when coupled with existing Space Force C2 systems, will provide sufficient capability to enable the decommissioning of the legacy Space Defense Operations Center system.

MGUE Inc 1 is improving. Since the January 2021 re-baseline, MGUE Inc 1 has successfully completed several major milestones in line with the APB. The final milestone for the ground system circuit card was completed in March 2021, and that card is in production. The aviation/maritime card completed Manufacturing Readiness Assessment in May 2023, enabling it to enter Low-Rate Initial Production. MGUE Inc 1 remains on track to meet its two remaining APB milestones: Program Executive Officer (PEO) Certification for the U.S. Navy *Arleigh Burke*-class Destroyer and the U.S. Air Force B-2 Bomber. The program will work through follow-on developmental and operational testing in fiscal year 2025, which is expected to result in formal delivery and close-out of MGUE Inc 1.

In addition to these legacy troubled programs, another program I am watching closely is Next Gen GEO. The Next Gen GEO program must deliver the primary mission payload this spring and continue to make progress and stay on schedule for Vehicle 1. The payload is in test, but over a year late. We cannot afford delays, and I am engaging with this program frequently to mitigate further slips.

Furthermore, launch is foundational to our ability to deliver critical capabilities to orbit, and we need the commercial launch industry ready to meet the growing demand. Over the last 5 years, ULA averaged only six to seven launches per year, and now, with the growth in demand, needs to significantly increase its cadence to around twice a month. ULA's ability to ramp up starts with the successful completion of the second Vulcan certification flight. Failure to complete the second certification flight will delay the launch of critical national security payloads this year, including GPS III-7, USSF-106, and USSF-87. In parallel, Blue Origin needs to scale its production of BE-4 engines. We are keeping an eye on whether these two companies can scale to meet our needs.

We have proven we can build small satellites quickly. As we start to deliver PWSA operational ground and 126 Tranche 1 Transport Layer satellites this fall, adoption and use of Tranche 1 next year will be key.

Finally, thanks to the Assistant Secretary of Defense for Space Policy's efforts in rewriting DOD's Space Classification Policy in December 2023, we are working on recommendations for the Deputy Secretary of Defense to move large amounts of critical program information out of Special Access Program stovepipes. Reducing classification barriers will significantly improve our ability to integrate space with other domains and enable better sharing with our Allies and partners.

MANAGING THE SPACE ACQUISITION ENTERPRISE

I have issued three sets of guidance to the space acquisition workforce since my confirmation in April 2022 that define our space acquisition tenets, the formula for going fast in space acquisition, and a list of essential program management skills. This guidance is key to improving the space acquisition enterprise.

In October 2022, I established strategic acquisition guidance outlining nine Space Acquisition Tenets (Appendix A) that formed the basis of a new direction to transform our space acquisition enterprise. These nine tenets strike at the core issues that slow us down. To emphasize how the tenets enable speed, last year I shared a simple formula for going fast in space acquisition (Appendix B), which now serves as the cornerstone of our approach to build resilient architectures faster. The tenets and formula provide the vision for how our space acquisition workforce will deliver space capabilities to outpace the threats. Aligned with this vision, our space acquisition workforce is adopting a culture of speed and must hone the essential program management skills outlined in the guidance I issued in December 2023 (Appendix C) to be successful.

When the tenets, formula, and essential skills are applied, our space acquisition enterprise will transform the space architecture while continuing to provide crucial capabilities for our Nation. This approach is all about speed in space acquisitions and can be applied to all systems in all orbits to get capabilities to the warfighter on operationally relevant timelines.

While designed to focus on speed, the formula yields additional benefits, including enhanced workforce satisfaction and faster technology refresh. First, the workforce can participate in an entire acquisition from start to launch in just 3 years. With a traditional 7-to 10-year large development effort, we see significant personnel turnover during that timeframe. Typically, the government would have at least three different program managers over the course of a program—generally one pro-

gram manager gets the program started, the next one gets the program through Critical Design Review, and the next one may get to IOC. By doing shorter development cycles, a single program manager and their team will be able to see the entire acquisition through and will be accountable for the entire end-to-end effort. Therefore, the team will have more ownership, which has positive implications for both the government and industry workforces.

Second, we have the opportunity for significantly faster technology refresh. Using the formula, technology refresh occurs every 3 years. Compare that with larger traditional space acquisitions where technology insertion and refresh are measured in 10, 15, or even more years depending on the program. The formula inherently drives faster modernization of our space assets, by allowing the on-ramp of new technologies every 3 years.

So now that we have the tools, we need to execute. Our job and our top priority as acquisition professionals is centered around execution. Simply defined, this means we must deliver programs on cost and schedule that work.

My focus is on ensuring that our acquisition strategy and RFP documents are realistic and executable. This means that our source selection plans must lead to awarding executable contracts. These are contracts with realistic and achievable cost and schedule baselines, performed by contractors with the right expertise, skills, and staff to do the job. Once under contract, we must proactively manage program baselines to deliver systems that work on cost and schedule.

Delivering on schedule is important because we must be ready to secure U.S. interests in, from, and to space, which includes supporting the Joint Force. Given the threats and increased capabilities of our competitors, and with our relatively flat funding, delivering on cost is more critical than ever. Every time we overrun a program, we basically rob our future efforts to modernize or do anything new, which does not allow us to stay ahead of threats to U.S. interests. We also stifle future innovation by limiting investment dollars to cover schedule slips and cost overruns. We simply cannot afford to do this anymore.

To maintain focus on execution, I remain committed to a battle rhythm of proactive, frequent engagement and periodic strategic reviews of our programs with my portfolio managers and PEOs. I continue to conduct status reviews with each of my PEOs every 2 weeks to discuss the status of programs within their purview. I also hold Quarterly Program Reviews for a deeper program analysis. During these quarterly reviews, the government program managers present the technical, schedule, cost, and staffing status, open risks and issues, upcoming activities, and an overall assessment of program health. Troubled programs continue to receive deliberate attention and targeted intervention to return them to a healthy status. Holistically, these reviews enable my workforce and me to ensure all our programs remain focused on delivering rapid, resilient, and integrated capabilities to our warfighters, on cost and on schedule.

I also continue to use the Space Acquisition Council (SAC) as a mechanism for fostering integration. Thanks to Congress, the SAC continues to be an integration forum among key leaders in the national security space community. Monthly meetings have covered a wide range of key topics with all major space stakeholders. The SAC remains a valuable tool to ensure coordination and synchronization of the national security space enterprise.

CONCLUSION

We continue to transform the space architecture to be more resilient and provide additional capabilities for the Joint Force. Our focus is on speed in our acquisitions and delivering programs on cost and schedule.

Thank you to the Subcommittee for all your support to the Space Force and space acquisition. I look forward to your questions.

Senator KING. General Guetlein.

STATEMENT OF GENERAL MICHAEL A. GUETLEIN, USSF, VICE CHIEF OF SPACE OPERATIONS

General GUETLEIN. Chairman King, Ranking Member Fischer, and distinguished Members of the Subcommittee, thank you for your continued support and for the opportunity to testify on the Space Force's posture for fiscal year 2025.

On behalf of the Secretary of the Air Force, Hon. Frank Kendall, and the Chief of Space Operations, General B. Chance Saltzman,

I am honored to share that we are wholly dedicated to forging a new service, purpose built for great power competition. Space has never been more critical to the security of our Nation, and the success or failure of the Joint Force depends heavily on the capabilities that we present.

Repeated actions by both the Russian Federation and the People's Republic of China underscore the urgency for action. Although we still may control the space over our competitors, they are working hard to close the gap and assert their dominance in space. We cannot afford to let this happen.

Space is the foundation for the Joint Force, and it is fundamental to our peaceful way of life. GPS [Global Positioning System] alone is an essential part of every aspect of our daily lives, from our cellphones to our banking systems, and even to our ability to get crops out of the field and groceries to the shelves. We cannot let our near peer competitors overtake us or we will lose what we hold dear. If we fail to keep pace and ultimately surrender our lead in space, every space-enabled benefit we enjoy today will be at risk, and the world will become a far more dangerous place.

We must maintain control of the domain in order to defend the United States and to protect the Joint Force from space-enabled attack. With only 3 percent of the DOD's budget, the Space Force offers a tremendous value proposition to the Nation. Every dollar invested in space brings asymmetric returns. But that also means that every dollar cut creates asymmetric risk.

Make no mistake. If we are to deter, and if necessary, defeat aggression in space and across the globe, we must continue to invest in the United States Space Force. Against a near peer adversary, control of space is the linchpin. Without it we cannot deter conflict, without it we cannot provide vital effects, without it we cannot protect the Joint Force, and without it, we cannot win.

The Space Force's theory of success includes three parts: avoid operational surprise, deny first mover advantage, and conduct responsible operations in space. The Space Force's budget request aligns with these priorities and is designed to support the National Defense Strategy by building training and equipping the Forces the Nation needs to preserve freedom of action in space while deterring and denying adversarial objectives.

Avoiding operational surprise requires us to maintain an accurate understanding of the space domain at all times. 8.3 percent of our budget is dedicated to the same. Operating across disaggregated sensor frameworks, the Space Force provides the maximum information possible to decisionmakers from the tactical to the strategic level.

Denying first mover advantage demands that we make an unwarranted attack against the United States impractical and self-defeating, 43.4 percent of our budget is devoted to this objective, investing in resiliency from missile warning and tracking, satellite communications, and position navigation and timing.

Finally, responsible operations in space describes a mechanism by which the Space Force contests and controls the space domain, 24.7 percent of the fiscal year 2025 Space Force budget is dedicated to this effort. Within the constraints of the Fiscal Responsibility Act, the fiscal year 2025 Space Force budget reflects hard choices,

and as a result, slows the pace of transformation and modernization. Addressing these challenges depends on guardians that are trained and ready to meet the high-tech demands of space operations. For that reason I would like to personally thank this Committee for its support of the Space Force Personnel Management Act. This will be a major force multiplier in the Space Force's efforts to modernize the way we recruit, build, and retain talent.

Thank you for the opportunity to discuss the Space Force's fiscal year 2025 budget and posture. In the face of accelerating threats, the guardians have clearly demonstrated the capability, the resolve, and the expertise necessary to face the challenges posed by our near peer competitors, but there is more to do. The support of this Committee enables our guardians to continue to preserve and expand our strategic advantage and outperform any pacing challenge.

I look forward to working with you as we defeat tomorrow's challenges together, and I look forward to your questions.

[The prepared statement of General Guetlein follows:]

PREPARED STATEMENT BY GENERAL MICHAEL A. GUETLEIN

INTRODUCTION

Chair Hirono; Ranking Member Sullivan; distinguished Members of the Subcommittee; thank you for the opportunity to testify before this body, and the American public, on the military readiness of the Space Force and our continued efforts to sustain such readiness into the future. On behalf of the Secretary of the Air Force, Hon. Frank Kendall, and the Chief of Space Operations (CSO), General B. Chance Saltzman, I am honored to share the Space Force's readiness vision for fiscal year 2025.

Space superiority is the foundation of the Joint Force, and we cannot achieve joint success without it. The demand for space forces outpaces resources by a significant margin. If we want to remain on top, the Nation must continue to invest in the United States Space Force and develop the capabilities to deter and if necessary, defeat aggression in space and around the globe. The Space Force must be resourced to protect our critical space-based services from adversary attacks, and to deny an adversary the hostile use of its space capabilities against our personnel.

Since its creation, the Space Force has pushed the boundaries of what it means to be a Military Service. Our guardians demonstrate the unique capability, resolve, and experience necessary to effectively secure and control the space domain in support of our Nation's defense. Even so, our competitors continue to mature their counterspace capabilities, both publicly and covertly, which is why the Space Force must remain vigilant to retain its readiness and capability advantages.

Recent actions by both the Russian Federation and the People's Republic of China, including space-related cyber-attacks, direct ascent anti-satellite demonstrations, and counterspace weapons development, demonstrate they do not seek peaceful access to space; but rather intend to conduct aggressive actions that could deny the United States the free use and benefits of space. Reports concerning specific counterspace capabilities exhibit the extent these threats pose to our Service members, the American public, and our very way of life. The United States Space Force will continue to significantly contribute to our Nation's integrated deterrence and resolve to maintain the most effective space forces in the world.

As Secretary Kendall and General Saltzman recently unveiled in February 2024, the Department of the Air Force (DAF) is undergoing a Department-wide effort to optimize the way both the Air Force and Space Force organize, train, and equip to meet the PRC pacing challenge. In the face of rising threats and dangerous shifts in the strategic environment, the DAF designed this effort to enhance our ability to effectively deter our competitors, and ultimately, prevail in conflict should such deterrence fail. We have seen these threats emerge rapidly, particularly in space as it has transformed from a benign environment to a contested domain. To address these challenges, the Space Force will reoptimize its readiness to meet the pacing challenge. At the direction of Secretary Kendall and General Saltzman, the Space Force is:

- Establishing Space Futures Command as a fourth Field Command to develop and validate concepts, conduct experimentation and wargames, and perform mission area design;
- Formalizing Space Force Combat Squadrons as our Units of Action and accelerating implementation of the Space Force Generation model (SPAFORGEN);
- Delivering an Operational Test and Training Infrastructure (OTTI) to provide our guardians with the most realistic, dynamic, and effective training solutions available anywhere.
- Implementing readiness standards that reflect operations under contested conditions rather than those of a permissive environment;
- Conducting a series of nested and synchronized exercises in the Space Force that increase in scope and complexity, fit within a broader DAF-level framework, and progress through a Service-level, data-driven process to measure readiness;
- Activating service components within Combatant Commands, providing commanders with space integration and synchronization assets they need to conduct all domain operations; and
- Redesigning career paths to produce guardians that meet our high-tech operational demands.

Meeting the pacing challenge, while also managing acute and persistent threats, requires the Space Force to retain both agility and expertise; one without the other risks unacceptable tradeoffs to our strategic interests, the safety of our people and assets, and continued peaceful access to space. Underpinning our success in, from, and to the space domain is the Space Force's ability to field combat-ready forces and ensure our guardians have the tools, training, and equipment required to prevail in a modern, all-domain fight. Continuing to fund Space Force readiness will remain essential to our Nation's defense now and in the future. The President's Fiscal Year 2025 Budget Request appropriately balances our readiness requirements to deter aggression and be prepared to prevail in conflict when necessary.

EVOLVING SPACE FORCE READINESS IN FISCAL YEAR 2025

Future Force Design

Since its inception, the Space Force has taken steps to improve its force design structure and "right-size" its acquisition, talent management, and organizational strategies to best serve its organize, train, and equip mission set. Through the Space Warfighting Analysis Center (SWAC), we initiated a methodical process to produce the most ideal set of future capabilities required for existing and emerging operational needs, threats, and costs.

Recognizing the need to effectively implement future force designs, we are prioritizing efforts to be forward-looking and maintain long-term readiness advantages in both capability and posture. As such, the CSO [Chief of Space Operations] ordered the establishment of a Space Futures Command aimed at providing better-defined structure, processes, and integration of our force design efforts. This new Field Command will develop and validate concepts, conduct experimentation and wargames, and perform mission area design.

Joint operations require extensive inclusion of space capabilities. A Space Futures Command will ensure the Space Force force design is comprehensive with technically sound capabilities, innovative doctrinal approaches to force employment, force structures organized for resilience and effectiveness, and training practices designed to retain competitive advantages in the face of the pacing challenge. We must have greater awareness of the materiel and assets our force requires, and the corresponding facilities and personnel needed to accomplish our missions. We must incorporate more proactive and applicable leadership and educational opportunities for our service members, and we must strengthen our people and facilities for the challenges ahead. This is a Department of Defense (DOD)-wide effort, but as the newest service, the Space Force has both the most ground to cover and the most agility to deliver operationally effective warfighting capabilities.

Effective force design analysis and recommendations are essential to delivering well-equipped, combat ready space forces, and the Space Force will leverage Space Futures Command to ensure high-fidelity modeling and analysis that balances fulfilling current operational requirements while transitioning to the force we need today.

Commercial Space Strategy

The pacing challenge requires that the United States, and the Space Force in particular, leverage the full breadth and depth of our commercial sector. The United States retains a significant advantage in commercial activities, which offer us key

opportunities to bolster our space capabilities and sustain our readiness posture, while simultaneously stimulating the space economy and enabling competition, rapid innovation, and cost-effectiveness. Our commercial partners afford us the ability to exploit what we have, buy what we can, and build only what we must; particularly as space has become an increasingly competitive and contested domain.

The commercial sector of the United States space enterprise provides us with an immense body of knowledge and innovative capability from which to draw upon. We have the most robust space enterprise in the world, and the partnerships the Space Force has fostered with private industry, academia, and allied nations empower us to act faster and with greater effect than we could alone. This is a critical line of effort for the Space Force, not only because of our fiscal responsibility to the American people, but also for the vast knowledge base we can draw upon to succeed in our mission. Commercial products that can be utilized to meet military needs will provide for a more cost-effective and timely acquisition, which supports the DOD and industry. Further, these partnerships free the DOD to prioritize dedicated products when capability gaps are identified, saving time, resources, and testing for those needs that are not commercially available or are inherently governmental missions.

Consequently, the Space Force developed a Commercial Space Strategy aligned with a broader DOD Commercial Space Integration Strategy, intended to further harness our strategic advantages in the United States commercial sector. This strategy guides our approach in building out a hybrid architecture designed to enhance resiliency and capacity in times of need. The Space Force's Commercial Space Strategy informs methods of integrating critical goods, services, and other activities already validated and tested by the private sector; improving access to existing and emerging technologies; and meeting our near-, mid-, and long-term architecture goals.

The Space Force Commercial Space Strategy is a new way of approaching industry partnerships, designed to propel our acquisition and operational practices and thinking into the future. As the technology available to and from private industry has advanced, the armed services must adjust our approach. This adjustment must allow the flexibility to onboard innovative and game-changing technologies; this is especially true of space systems. Integrating the products and capabilities found throughout American companies and the research and development community will streamline space operations, fortify our hybrid architecture, and ensure we take a proactive posture against threats.

By utilizing commercial capabilities and systems along with informed requirements, the Space Force will undoubtedly realize an even greater competitive advantage.

International Partnerships

With the increasing inclusion of allied nations in our space activities, we develop stronger coalitions, able to conduct coordinated operations in the space domain. This inclusion will allow us to deliver more resilient capabilities supporting space operations across the conflict continuum. We continue to reduce information sharing and classification barriers with allies to enable combined understanding of the threats, and the needed capabilities to prevail in a conflict, should the need arise.

As our service refines mechanisms to share understanding of the domain, and continues to develop interoperable capabilities through traditional acquisition, we also look to work with allies and partners to collectively harness the power of the international commercial space sector. Our allies have great interest in working with the Space Force to more effectively utilize commercial innovation and capabilities in a coordinated manner. They see the same benefit in the commercial space sector, and we hope to grow opportunities to leverage their innovation to support combined operations with increasingly diverse nations.

Space Force Generation

As an independent military service, the Space Force maintains its own readiness standards, reporting, and development through the SPAFORGEN model. This model affords us the ability to ensure a combat-ready force for all guardians, whether Employed-in-Place or otherwise. SPAFORGEN ensures that the Space Force can effectively present combat ready space forces to Combatant Commanders and provides Guardians with the time and resources necessary to develop and train to remain agile and effective.

The Space Force measures its readiness based upon the necessary tools, training, and manpower needed to achieve our strategic and tactical requirements. Ultimately, the Space Force must ensure that all our Guardians can effectively rise to the challenge through rigorous development and capability deployment. The Space

Force is redefining our readiness reporting to portray our current posture and the presentation of space operators to the Joint Force. To that end, in February 2024, the Space Force transitioned from the Air Force Input Tool to the new Space Force Input Tool to support our service-specific, employed-in-place readiness inputs for the Defense Readiness Reporting System.

In accordance with law, the Space Force presents forces and capabilities that underpin all instruments of our military power, and as mandated by Congress, the Space Force is responsible for organizing, training, and equipping those forces. The Space Force provides ready and capable operators to commanders worldwide, enabling these commanders to deter threats and, if necessary, prevail in conflict. Once presented, our Space Force Combat Squadrons will serve as unique Units of Action that undertake day-to-day missions for combatant commanders, while retaining our capacity to prepare and ready for high-end fights.

SPAFORGEN ensures that forces presented to Combatant Commanders can execute missions and tasks and are equipped to make appropriate recommendations on the effective employment, task organization, operational synchronization, and command relationships of space forces.

Operational Test and Training Infrastructure

OTTI is an overarching concept describing a collection of programs and capabilities, both live and synthetic, that enable high-end testing and training of Space Force systems and operators against a thinking adversary. The Space Force relies on OTTI investments as a critical component of SPAFORGEN's success, and our overall ability to deliver combat-ready forces throughout readiness cycles. Generally, Space Force's ability to effectively develop, test, and train tactics will create greater and hugely positive impact on operational outcomes. OTTI provides the means to execute those core activities and is a critical component to generating Space Force readiness.

More specifically, OTTI provides Guardians unique and realistic training against simulated adversaries, providing dynamic scenario issues which will prepare Guardians for the most diverse and challenging environments available. Our goal is for Guardians to receive training which prepares them for the threats they may face, therefore, these scenarios will be challenging and hyper-realistic. Producing this capability requires that we create an intelligence-informed accounting of adversary capabilities and invest in high-fidelity, mission-specific simulators. Such testing and training are invaluable to our Guardians and serves to establish a greater, combat-ready force posture.

It is imperative that we adequately invest in our test and training infrastructure so we can better prepare for the "fight tonight", and the President's Fiscal Year 2025 Budget Request appropriately prioritizes Space Force OTTI as a critical function of Space Force readiness.

Service Component Activation

The mechanism by which the Space Force ensures full integration and synchronization of space activities throughout the combatant commands is via Space Force Service Components. The Space Force established its first three service components in 2022 at U.S. Indo-Pacific Command via U.S. Space Forces for USINDOPACOM (USSPACEFOR-INDOPAC), U.S. Forces Korea via USSPACEFOR-KOR as a subordinate unit to USSPACEFOR-INDOPAC, and U.S. Central Command via USSPACEFOR-CENT.

In 2023, we established USSPACEFOR-SPACE as the Space Force Service Component to U.S. Space Command and USSPACEFOR-EUCOM/AFRICOM (USSPACEFOR-EUR/AF) as the component to U.S. European Command / U.S. Africa Command and will continue standing up component and sub-component commands as needs may require. The Secretary of the Air Force directed the activation of the remaining Service Components no later than 1 October 2025 and we are on track to achieve that goal.

Facilities and Infrastructure

Space Force Facility, Sustainment, Restoration, and Modernization (FSRM) and Military Construction (MILCON) funding enables the Service to prioritize requirements which reduce risk to mission and the force. Structural, electrical, and power improvements to operational facilities reduce risk to mission and enable our joint and coalition partners in the fight, while quality of life infrastructure and facility improvements reduce risk to the force by improving resiliency amongst our Guardians and their families.

Facilities and infrastructure are crucial to Space Force missions which are predominantly employed-in-place from facilities that are often inseparable from the weapon systems employed. While the Space Force does partner with the Air Force

for significant logistics, security, medical services, and human resources support, the Space Force's ability to prioritize its unique FSRM and MILCON at our specific installations ensures we appropriately optimize our funding requests and maintain a sufficient, stable, and predictable funding strategy to execute its assigned missions as an independent service. Moving forward, the Space Force will continue to prioritize projects that increase facility and infrastructure resiliency and Service readiness, while balancing the requirements of the National Defense Strategy (NDS) and future projects.

Weapon System Sustainment

Space Force Weapon System Sustainment directly supports the Space Force's ability to sustain the day-to-day readiness of weapon systems performing space missions, including combat power; missile warning/missile tracking; positioning; navigation and timing; satellite communications; space domain awareness; and environment monitoring. Maintaining operations for these systems is critical to ensure Homeland and allied defense, and funding for these priorities must be continued for each to not risk opening capability gaps which will increase our vulnerability to adversary systems.

From fiscal year 2024 to fiscal year 2025, the President's Budget Request prioritizes programmatic and operational readiness in support of the NDS, to include obsolescence mitigation and software maintenance for Upgraded Early Warning Radar and North American Aerospace Defense Command Cheyenne Mountain Complex systems. Moving forward, the Space Force is developing a necessary methodology to identify quantifiable solutions to balance sustainment support and future readiness needs.

Assured Access to Space

The United States requires the capabilities, infrastructure, expertise, and tools necessary to access space on-demand throughout our military, civil, and private enterprises. To support the growing demand to leverage our launch capabilities, the Space Force established Assured Access to Space as the largest organization within Space Systems Command, comprised of Space Launch Delta 45, Space Launch Delta 30, and the Program Executive Office for National Security Space Launch; Rocket System Launch Program; Launch and Test Range System; and Servicing, Mobility, and Logistics.

Assured Access to Space is ultimately responsible for procuring launch services and delivering on-orbit capabilities for the entire National Security Space enterprise. This critical organization manages range sustainment programs in support of the DOD and commercial launch customers and supports three primary objectives: space access; rapid delivery; and orbital resiliency. Assured Access to Space will also transform today's launch sites into modern spaceports, with the capacity and resiliency necessary to ensure our Nation's ability to deliver capabilities into space when they are needed.

Assured Access to Space is leading the Nation's planning for a new space mobility mission area to deliver space access, maneuver, and logistics capabilities needed to tackle growth in commercial satellite launch cadence and prepare for new operational concepts for mobility in orbit. It includes investment in on-orbit servicing and maneuver prototyping with the Air Force Research Laboratory, the Defense Innovation Unit, and other mission partners.

Spaceport of the Future

For decades, the United States has continuously maintained its space launch infrastructure to meet limited demand from a small customer base. However, as demand for national security, civil, and commercial space capabilities continue to grow, our launch range infrastructure has not modernized sufficiently to meet the significant increase in launch demand. Accordingly, the Space Force undertook a broad effort to analyze our launch infrastructure enterprise and assess range modernization efforts to maximize our ability to support U.S. launch requirements.

The Space Force's Spaceport of the Future is taking a comprehensive approach to look at all factors contributing to range costs and launch throughput. Launch rates rose approximately 30 percent each of the last 2 years, and we expect rates to continue to rise through the Future Years Defense Plan. Therefore, the Space Force is prioritizing enhancements so that we have the infrastructure needed to meet these launch demands.

To support the demand, the President's Fiscal Year 2025 Budget Request asks Congress to fund our Spaceport of the Future activities to allow for increased launch throughput, enhanced capability, and assured access to space capabilities for the warfighter. Without this critical funding, we will see significant degradation in our

infrastructure and our ability to provide launch services for our national security, civil, and commercial partners.

We are thankful that Congress is providing the requisite reimbursement authorities necessary to collect direct and indirect costs incurred by the Space Force associated with launch activities. These authorities will facilitate commercial participation and investment into the United States' launch infrastructure and further our ability to meet growing range demand.

Agile Talent Management

The Space Force sustains its readiness through its most important asset: our people. We need to enable our Guardians to succeed in an agile, adaptable manner to field the greatest space Force in the world. As a result, the Space Force is creating an innovative talent management system, establishing flexible service options and advanced training programs to establish opportunities for all guardians, including specialized credentialing, academics, experiences with industry partners, and tailored duty experiences to name a few.

The Space Force is also participating in piloting DOD's Defense Civilian Training Corps program, designed to identify university talent, provide scholarships for accepted students, and prepare students for a career in DOD acquisition-related fields. This pilot program's goal is to create a sustainable pipeline of civilian talent into the service and motivate university students to serve their country as civilian members of the DOD. Additionally, Space Force's existing University Partnership Program further deepens our talent pool and improves enterprise-wide skill set development. Moreover, the Space Force is expanding its space-centered curriculum offerings within DAF educational programs, including Basic Military Training, Non-Commissioned Officer Academy, United States Air Force Academy, Officer Training School, and Reserve Officer Training Corps.

Even though we are the smallest military service, the Space Force places significant emphasis on our recruiting and retention efforts. Given the Space Force's highly technical mission set, we must remain diligent in meeting our recruiting goals and maximize guardians' flexibility to retain the talent we need to maintain our readiness advantages. While we have not experienced the recruiting challenges other military services have experienced to date, the Space Force needs to sustain its efforts, particularly as we expect to grow in Fiscal Year 2025.

I especially appreciate Congress' support and enactment of the Space Force Personnel Management Act (SFPMA), which creates significant flexibility in how we manage our Service members to augment their skills and increase efficiency in workforce management. In accordance with the SFPMA, the Space Force is quickly moving to integrate its existing Active component guardians with Reserve Airmen in space-focused career fields into one service. This critical authorization allows the Space Force to not only invest in and grow our talent pool, but also to retain such talent by offering guardians greater flexibility in their professional experiences.

The Space Force will always look to identify more innovative, adaptable, and cutting-edge opportunities in talent management to ensure our guardians are able to rise to the challenge. Moving forward, the Space Force will refine and expand the ways we provide guardians with the tools, training, and resources they need to succeed operationally, professionally, and personally.

THE WAY AHEAD

The United States has approached our space activities with a desire to benefit not only Americans, but all people. It remains our goal that space remains open and accessible to all nations and space faring actors for peaceful use.

We must continue to ensure this domain is not controlled or threatened by an adversary who does not seek the peaceful use of space. The United States is uniquely capable of maintaining an open environment for all nations in space. Just as we have ensured open access to maritime trade and sea routes, so too will we in space.

Yet, our near-peer competitors are watching our efforts and attempting to preempt, deny, circumvent, and counter our space capabilities. While we are the most recent military service, we are not—and never have been—a new military service. We are built on decades of advances and contributions by dedicated Service members, civil servants, and industry partners who devoted themselves to their country and continue to do so.

These guardians are stationed around the world in our deltas, combatant commands, and the intelligence community, ready to provide the combat capabilities we need. Our Units of Action will contribute to every combat mission the DOD undertakes. The training exercises and assessments will evolve to simulate warfare of the 21st century. At the center of it all is our readiness posture and our force-wide en-

deavor to provide combat decision makers with the most capable guardians we can, along with the training and equipment needed to succeed.

Our ability to guarantee access to space is reliant upon our guardians, our technologies, and our commitment to push ourselves further, faster, and higher. Readiness does not mean purely standing alert; it is a mind set and a quality which requires investment in the mission, in oneself, and in each other. It is ultimately our people who empower us to do what we do; the technology and the tactics only enable our greatest assets to accomplish our Nation's needs. The DAF re-optimization effort is as much an investment in our people as it is a restructuring of combat capabilities.

There has never been a more important time for the Space Force to secure our Nation's interests, and we must ensure that we are properly resourcing the Space Force to guarantee the ability to achieve space superiority into the future. I truly appreciate this committee's continued support for our guardians and their mission; and look forward to working with you.

Senator KING. Thank you all three. That was excellent testimony, and I appreciate it.

First I want to make a confession. I noticed my colleague, Senator Cramer, is in the room. When the Space Force was first proposed, I was a skeptic. I ultimately supported it, but I just was not sure that this was a direction we needed to move in.

I am now a convert. I think the Space Force is absolutely in the right place at the right time, taking the right actions, and I am glad that we have an organization that is dedicated strictly to that mission. I do not know how often you hear Senators admit mistakes, but I wanted to get that on the record.

The other thing I had to note, somewhat humorously, several years ago I visited Pine Gap in Australia with members of the Intelligence Committee, which of course is one of the world's major ground stations for space assets. We were with the Intelligence Committee. I was sure that this was highly classified. I came home, did not talk about it to anyone. They did not even tell them where I went until I noticed there was a Netflix series called "Pine Gap," which was set at Pine Gap. So I guess it was not all that classified.

Mr. Hill, classification. Are you making any progress on the declassification? Having information that cannot be used by the people that need it is not very useful information. Talk to me about where you are in the declassification process.

Mr. HILL. Thank you, Chairman King. Yes, we are making progress. With the Deputy Secretary having signed out the new policy, that took us a good year to rewrite the policy. It was replacing a policy that was 20 years old. That policy was clearly out of date. It provides an updated framework for the program developers and operators to understand what is the minimum classification, if any classification, is necessary for a particular type of activity or program.

We then turned that over to the services, and Secretary Calvelli is taking it very actively to them, rewrite the classification guides that they own for the particular systems that they develop. One important thing to understand—

Senator KING. Human nature is to overclassify.

Mr. HILL. Yes.

Senator KING. Is there some systematic way to say does this really need to be classified at this level? Is there a mechanism?

Mr. HILL. Yes, that policy very clearly provides that, and the direction Space Force and Secretary Calvelli have taken to heart is to move as fast as they can to update to that policy, which I expect

will result in many things being removed from Special Access Programs. That will enable better planning and integration across the Joint Force.

So what I could offer is maybe Secretary Calvelli could talk specifically—

Senator KING. Secretary Calvelli, your views?

Mr. CALVELLI. Yes. There was a 2004 policy that threw most space activities into the SAP world. I mean, it was actually a written policy. Thanks to John, and before him John Plumb, they actually got that policy updated for the first time in 20 years this past December. So now that frees us the ability to actually take programs out of Special Access channels. Because Special Access channels, all they do is cause stovepipes.

So now we actively have a team in place that has put together a plan, a strategy. Instead of doing it program by program, we are doing it all at once. So we are doing one entire strategy up front. We will have it in place this fall to actually remove the vast majority of all of our space programs and reclassify them into TS, Top Secret, and Secret. They will not become unclassified but they will become Secret and TS, which will allow a lot more sharing as well as the ability to get rid of all those stovepipes.

Senator KING. Thank you. I appreciate that and hope that project will continue.

A big question and not much time left. Commercial integration. All of you talked about resiliency. One of the keys to resiliency is proliferation—lots of smaller satellites, fewer single targets. What have we learned from Ukraine about the use of commercial satellites, particularly Starlink? Has the theory of proliferation worked?

Mr. HILL. I think we are seeing that the innovation that came out of the commercial sector, which we are also adopting in many of the DOD architectures, that proliferation is absolutely one of the key elements of a resiliency strategy that supports mission assurance. Ukraine is proof of that.

Senator KING. Thank you. Thank you all very much. Senator Fischer.

Senator FISCHER. Thank you, Mr. Chairman. I would like to followup on the commercial side a little bit and how that ties in. First of all, thank you to the Department for issuing some good strategy in driving that forward with some goals and requirements and focus. Mr. Calvelli and General Guetlein, especially, I believe you both need to be thanked for this. We continue to need to harness that.

Mr. Secretary, one of those hard problems is achieving space domain awareness and finding and characterizing our adversaries' activities in space. Can you speak to commercial capabilities that exist today in this area, both in tracking algorithms and in capturing commercial imagery of objects in space as well as any work you are doing in the private sector with this mission.

Mr. CALVELLI. Yes. So space domain awareness, as you know, is probably key to any kind of activity we would ever counter in space, understanding what is in the domain and keeping track of it. It is high on our list and I know it is high on General Whiting's list, as well.

We are taking advantage of commercial where we can. There are some amazing companies out there that actually have ground-based telescopes today as well as other commercial data that they are able to give and that we purchased through multiple avenues, to use that.

We are also updating several of our radar sites, actually building new radar sites. A program called Deep Advanced Space Radar, or DARC, is actually a new set of radars we are putting in three locations—Australia, in the Outback; Texas; and then United Kingdom—and that is going to give us space domain awareness capabilities to track really small objects in geosynchronous orbit.

We are also upgrading some of our internal Space Force antennas that we have, or telescopes, to do space-based tracking. But a combination of upgrades that we are making on our systems as well as continuing purchasing of commercial, and as more and more commercial companies start to take on space domain awareness mission, taking advantage of that, I think over time we will grow the capabilities that we need for space domain awareness.

Senator FISCHER. Do you need any more authorities or funding to make sure that this is going to happen, or are we on the right track now, do you think?

Mr. CALVELLI. Never say no to funding.

[Laughter.]

Mr. CALVELLI. But I think we are making progress against our plan right now. I mean, we could always accelerate things with additional dollars.

Senator FISCHER. What about authorities?

Mr. CALVELLI. For buying space domain awareness data? I do not see any show-stoppers with authorities. I do not know of General Guetlein would like to comment.

General GUETLEIN. Ma'am, we are not challenged by authorities. We are challenged by resources. We have the Joint Commercial Office today that is a partnership with industry and 15 of our allied partners. We have locations in Shriever here in the United States. We have locations in Australia and locations in Europe, where we are buying space domain awareness data from all the providers and then sharing it openly between all members. That did not require any additional authorities, but we are spending on orders of about \$25 million a year to buy that data and distribute that data.

Senator FISCHER. That brings me to my second point about the budget request. We have seen, throughout the first 4 years, a lot of ramping up for Space Force, the budget increased, and that is not the case this year. General, we are looking at flat budget growth, which really amounts to a cut when we consider inflation into this, and it does limit Space Force's ability to meet the current threats that we face. You alluded to that. Would you like to expound on that a little bit more?

General GUETLEIN. Yes, ma'am. I would put it into context with two things. One, right now there is a capability gap between us and our near peer competitors. That capability gap is rapidly narrowing. Given the resources we have today, we had to make some very tough decisions between balancing today's readiness and investing in tomorrow. Then balancing also within the Fiscal Responsibility Act. That really constrained what we were able to invest in

the future. If we are able to either maintain that capability gap that we currently enjoy today or to widen that capability gap, we are going to have to expand the amount of resources that we are spending in space.

Senator FISCHER. How can we make that point clear? Senator King and I speak often about looking at classification of information that is out there so that, first of all, many of our colleagues, I think, would pay more attention to that if their constituents or the media is paying attention to what would be declassified and the information put out. So how do we get it to the public?

General GUETLEIN. Ma'am, we have got to talk about, if you look at that Space Force was stood up in 2019, prior to 2019, we did not talk about this. It was too highly classified, we did not share data with our allies, et cetera. Since 2019, we have changed that dialog. We have a long way to catch up, though, in this information environment, of educating both the public as well as our Members on the Hill of what the challenges in space are.

But more importantly the dependencies that we have as a Nation, as a free society on space, outside of the military, on a day-to-day basis, are immense, and we have got to get that message across.

Senator FISCHER. Thank you. Thank you, Mr. Chairman.

Senator KING. I have often thought of the Fiscal Responsibility Act as a straitjacket we put on ourselves, and now we are dealing with the consequences, not only in your budget but across the board.

Senator Cramer, the godfather of the Space Force.

Senator CRAMER. Thanks, and your confession was very heartwarming. I bet it was really good for your soul. Anyway, that said, thank you, gentlemen—and frankly, thank you for your candor too. I think this is really important.

I want to start with the disruptor side of things. Secretary Calvelli, you referenced nontraditional partners. Space is so interesting because the Air Force has these wonderful prime contractors that respond to whatever they are asked of. Space, it seems to me, seems be responding to the private sector itself, the commercial side, which has been so active, and that is good.

I remember one of my very first discussions with General Raymond was, “You have a white sheet of paper. Please utilize the freedom that provides and don’t adapt to the culture that you are coming from.” So whether it is a disruptor in the private sector, you talked about fixed price as a contributor to competition, when I think of the Space Development Agency I always think of SDA as the disruptor within the service itself. I am sure that creates a lot of tensions, and I recall several conversations in the last few years, particularly the early couple of years.

So with the spiral development concept that you all use and that SDA uses, help me understand the role of SDA as the acquisition part of the shop, and then their role in providing, whether it is maintenance or management, participating, or do you just go to them and say, “We need 100 more of these things. Buy them”?

I ask that question, honestly, with some concern that SDA could end up getting a little bit handcuffed and not be the disruptor we

need them to be within the larger Space Force, if that makes sense, and you can elaborate and correct me where I am wrong.

Mr. CALVELLI. No, I think you are right.

Senator CRAMER. Thank you.

Mr. CALVELLI. So SDA has been doing a magnificent job in terms of getting capabilities to orbit. So their first spiral, what they call Tranche 0, got 27 satellites in orbit, 8 missile warning/missile tracking satellites, and 19 transport satellites, and we are demonstrating those capabilities now.

Tranche 1 will start launching again. December will be the first set of launches for there, again more transport satellites, and then next spring more tracking satellites.

So from where they fit in, all things proliferated at low Earth orbit that relate to missile warning, missile tracking, as well as data transport, SDA is our go-to. That is their strength. Their strength is small sats proliferation, low Earth orbit, hundreds of miles above the Earth.

We tend to go to Space Systems Command for the more traditional missions, such as military satellite communications at higher altitudes, higher altitudes for missile warning for launch, for space domain awareness. Then we tend to go to Space RCO for things that are related to, I will say, protect and defend kind of missions that are unique, that would go directly to support Space Command.

But overall it is working out pretty good. SDA is part of the Space Force. They are part of the family. They fit in. Even though they are a little bit disruptive, they fit in pretty nicely, actually. I think they are showing the way to the other parts of the organization that, by building smaller and by using fixed price you actually can go faster. I am really impressed with them bringing in new space companies like Sea Air Space and Rocket Lab and York Systems, and using commercial bus lines, like we see at Airbus and at Terran Orbital. I think those are all really healthy things for the country.

So under my watch I expect to continue to see SDA keep doing their great work. I think the biggest thing we will see down the road is we need to make sure, as we launch Tranche 1, which is operational systems next year—

Senator CRAMER. Yes.

Mr. CALVELLI.—that people use it. It does not matter how fast we build them if no one uses them, and we need to get the services to ramp on it and adopt it.

Senator CRAMER. General, just elaborating a little bit on that, then is there a handoff, or does SDA continue to sort of operate in that space after the assets are launched? As the Secretary said, if no one uses them, but if no one is using them, does SDA continue—so do using them and helping develop new and spiral as they operating what they have done already?

General GUETLEIN. Yes, Senator. So as Secretary Calvelli said, we have integrated Space Development Agency fully into the United States Space Force—

Senator CRAMER. I understand that.

General GUETLEIN.—so they are a part of the team. Their capabilities are being detail planned into our wargames, our exercises going forward, and into our war plans. So we are already counting

on that capability and starting to test it. Like Secretary Calvelli said, we already proved Link 16 from space. We are now taking that capability and playing it into the exercises to see how it plays, understanding how it is going to support in a contested environment, and how do we continue to take advantage of it.

Senator CRAMER. Thank you, and if there is another round I may get into some of the budget stuff. Thank you.

Senator KING. Senator Tuberville.

Senator TUBERVILLE. We recently had a discussion with General Saltzman about refueling, and he wanted \$20 million, I think, in the 2025 budget. How far are we behind China in refueling? This \$20 million was only for a study. Can you explain that? I mean, \$20 million for a study, other than \$20 million more for learning how to refuel, and why we need to refuel, and how far behind we are. Anybody want to answer.

General GUETLEIN. Yes, Senator, that is a good question, and I do recall you asking the CSO about that question. Right now we are doing the exploration of refueling in space to understand what does it actually contribute to the fight, because there is a balance between building refueling capability into a satellite, which is semi-expensive, and buying proliferated, lower-cost constellations. So we are going to need a combination of both. We are not sure what orbits are going to be which. We are not sure how we are going to do refueling as a service yet. So the \$20 million is to actually study those effects.

Senator TUBERVILLE. Anybody else?

Mr. CALVELLI. Some of that fund actually goes to some demonstrations, as well, not on space but on the ground side, actually, looking at what it takes to go build the refueling unit and some demonstrations that we are doing on the ground side in terms of just the concept of two space vehicles docking and being able to actually put a refueling module in and how the refueling works.

Some of the money is going to study work to see where the bigger picture is, and other some of that money is also going to actually design work and demonstration work.

Senator TUBERVILLE. Going back to commercial capabilities, are we leveraging those the right way, General?

General GUETLEIN. Yes, Senator, we are. Secretary Hill just talked about publishing of the DOD's Commercial Space Strategy. On the heels of that we published the Space Force Commercial Space Strategy, which is all about how do I take advantage of space to start filling in resiliency, capacity, and redundancy into our capabilities.

What we do know today is I cannot build all the kit that I am going to need. We are going to rely on partnerships, partnerships with allies and partnerships with our industrial partners. If you go back to the history of the United States, we have always relied on our industrial base during times of crisis or conflict, and this is going to be no different.

So we are currently designing in how to take maximal advantage of those capabilities and innovation that is coming out of commercial to build out what we call hybrid architectures, which are a combination of DOD, civil, allied, and commercial platforms alto-

gether, to get us to that capacity and that resiliency that we need in the future.

Senator TUBERVILLE. There is not a week goes by that I do not have somebody coming from Huntsville that is building new satellites. I mean, it seems like it is a growing trend, and whether it is building or refueling or using nuclear energy in satellites or offensive and defensive satellites.

Do you all see the same thing? I mean, are you all overwhelmed with people that are getting in the satellite business, Secretary?

Mr. CALVELLI. Yes, it is amazing. We are very fortunate—knock on wood, and I hope it keeps up—the space economy is starting to boom, and we are seeing amazing entrepreneurship from across the United States and companies come in.

A week does not go by that a new company does not come in and tell me about some great concept that they are pursuing and doing. What is really wonderful is that they are also getting great investment dollars, as well, to be able to start themselves off. We are excited about the new space economy that is booming.

Senator TUBERVILLE. Seems like they have got a lot of money they want to invest, which is fine with us, right?

Mr. CALVELLI. Yes, absolutely.

Senator TUBERVILLE. It helps us all.

General, what about recruiting and retention in the Space Force? Could you talk a little bit about that?

General GUETLEIN. Thank you, Senator. We have the highest recruiting and retention in the United States Space Force today. We continuously exceeded our recruiting goals by several hundred. We have more people beating on our door to come into the Space Force than we can possibly take efficiently today, so that is a great problem.

From the retention side of the question we are also doing great. We are in the high 90's on both enlisted and civilians, and we are able to retain that technical talent that we need for a complicated domain.

Senator TUBERVILLE. It seems like that would be one of your most important things is retention, experience. A lot of money out there in the private sector, as we just talked about, building satellites. So you do not see any problem in retention? We have not had that problem?

General GUETLEIN. No, sir. We have not had that retention today in the United States Space Force. We are constantly watching for it. We are constantly trying to make sure that we are giving our guardians an experience and that we are giving them the tools that they need to be successful. But like I said, right now we are in the high 90's for both our enlisted and our officers for retention.

Senator TUBERVILLE. Thank you. Thank you, Mr. Chairman.

Senator KING. Senator Rounds.

Senator ROUNDS. Thank you, Mr. Chairman. First, let me just say thanks to all of you for your service to our country. We appreciate the opportunity to have this open briefing.

I want to focus on just a couple of items that I think we sometimes miss in the discussion when we are in a classified session, and part of it is the budget itself. On May 1st of this year, in front of the SASC [Senate Armed Services Committee] hearing on the

Space Force posture, it was reported that we have got basically a decrease in the Space Force budget for 2025 from 2024. The request in the fiscal year 2025 is \$29.4 billion, which is a decrease of \$600 million from fiscal year 2024—\$18.7 billion for research, development, and testing, and the fiscal year 2024 request was \$19.2 billion, the enacted was \$18.6. That is almost \$600 million less.

We are talking an additional \$650 million less with regard to procurement, and we are talking \$122 million less with regard to operations and maintenance, and we are looking at about \$9 million, almost \$10 million less with regard to military personnel.

Look, that does not bode well for the fact that out of the five domains we have got—air, land, sea, space, and cyberspace—to walk in and suggest that while China and Russia are both expanding their operations in space it would appear from the budget numbers themselves that we are suggesting a decrease in our operational capacity.

Mr. Hill, your thoughts.

Mr. HILL. Senator Rounds, that hits the nail on the head of a problem we face this year. We have all mentioned it. I mentioned it. I think the Chairman or the Ranking Member mentioned the constraints of the Fiscal Responsibility Act, one. That was one of the factors we had to deal with this year. Two is something that General Guetlein spoke to, the different nature of the Space Force budget. So when you get through putting together all the must-pay bills, and the Department of Defense has must-pay bills of salary and support to families, and operations, and so forth, of the forces, and you get down to what is left of discretionary, you come down to areas like readiness, research, development, testing, and evaluation—

Senator ROUNDS. We are cutting it, are we not?

Mr. HILL.—and procurement, and so where are you going to make those cuts? The cuts focused more, maintain the readiness, sacrifice some of the future, and those investment accounts are very—the Space Force has a high concentration of them.

Senator ROUNDS. Let me go on. General Guetlein, I think you wear and uniform, and it is always your professional opinion that we are looking for, and that is how much do you need in order to do your job. Right now I am looking at this saying we are reducing what you have and expecting you to get the job done. The bottom line is we are expecting more out of Space Force in the next couple of years than we have ever expected in the past, as we remove some of our air-based capabilities, ISRs [Intelligence, Surveillance, and Reconnaissance] specifically. What is the number that is appropriate as opposed to what we are seeing in the proposed budget?

General GUETLEIN. Senator, I cannot give you a number. I can tell you that the threat is increasing daily. They are intent on not only denying our ability to use space, they are actually proving extremely capable at denying our ability to use space. They are trying to narrow that gap of capability down to zero or even negative, and we have got to increase that gap.

Senator ROUNDS. General, if we were in a classified session and we asked you which programs, which products, which plans you

proposed were denied in this budget, would you be able to give us a straight answer at that time?

General GUETLEIN. Yes, sir.

Senator ROUNDS. Thank you. Look, and let me go on a little bit. Right now we have got guys in the Gulf sitting on destroyers and other equipment that we have got that are in harm's way. Part of what we expect is to be able to provide them with accurate information, intel, ISR, to be able to identify the guys that are shooting at them, the Houthis. Today in the Gulf we have reduced numbers of those types of assets available, and yet we have got guys still sitting there. Now, they are knocking off the actual weapons that are being shot at them, but I think it is about time that we start using the assets that we have got to find the guys that are making the decisions on when to shoot them and take them out before they are attacking our people.

The ISR that we have got right now is air-based and space-based. Are we in a position to provide the type of ISR necessary today in space to actually provide these folks with real-time information about who the bad guys are and where they are at and how we get at them?

General GUETLEIN. Yes, Senator, we can provide that information from space, and we do it every single day. But as this threat continues to mature we are going to need additional ISR capabilities, both in air as well as in space.

Senator ROUNDS. Thank you. I think that is a very straightforward answer. We need both, do we not?

General GUETLEIN. Correct.

Senator ROUNDS. In the air-based and space-based.

General GUETLEIN. Yes, sir.

Senator ROUNDS. Right now we are short on both.

General GUETLEIN. The closer in that we get to the actual threat itself, we need to start going more toward space to become resilient and to get around the anti-access/aerial denial capabilities of our adversaries. But the standoff capability very much needs to be airborne and into other types of conflict also needs to be airborne.

Senator ROUNDS. Thank you. Thank you, Mr. Chairman.

Senator KING. Senator Warren.

Senator WARREN. Thank you, Mr. Chairman. When Russia invaded Ukraine it destroyed Ukraine's internet and its telephone access, and to help get Ukraine back online, SpaceX, one of our defense contractors, donated satellite internet terminals, called Starlink, and this allowed Ukrainian soldiers to run apps to target Russian forces and to be able to communicate with loved ones back home.

Earlier this month, I wrote to DOD about Russia's use of Starlink terminals. Reports indicate that Russia has been able to buy Starlink terminals on the black market and that SpaceX has not cutoff their access, and that provides a major advantage to Russia on the battlefield.

Now SpaceX is owned by Elon Musk, who has advocated for, quote, "a peace plan," close quote, that reports suggest may have been developed after speaking with Vladimir Putin.

Congress has a constitutional responsibility to make sure that taxpayer money does not go to companies that undermine U.S. na-

tional security goals. So I think it is critical that we get to the bottom of this.

Mr. Hill, you oversee our space and missile defense and you have been working with SpaceX to counter illicit use of Starlink terminals. Let me start by asking, was SpaceX completely cooperative with DOD in its efforts to address the use of Starlink terminals by Russian forces?

Mr. HILL. Senator, not only has SpaceX been very cooperative with the entire United States Government and the government of Ukraine, they have been forward leaning in identifying and bringing information to us.

Senator WARREN. Okay. Good. Good. I am glad to hear it because it is obviously critical that DOD contractors are not undermining U.S. foreign policy.

So Russia's outdated communications have been a major contributor to their failures in Ukraine. Starlink obviously would be enormously valuable to the Russians. It would provide Russia with secure communications that they sorely need, which would significantly erode Ukraine's advantage on the battlefield. I understand this is an unclassified environment so I do not want to go anywhere where we should not. But I think there is a compelling public interest to conduct this oversight and to understand how DOD is plugging leaks here.

Mr. Hill, in the broadest terms, can you describe how you worked with SpaceX to address this illicit use?

Mr. HILL. So in broadest terms, recognizing that Russia has long-standing experience operating black markets—

Senator WARREN. Yes.

Mr. HILL.—and is now leveraging black markets on their own. We have, one point, the Commercial Integration Cell. This is a cell that combines Space Operations Center where commercial companies and the U.S. Government can work together and can share information, including company proprietary information and classified information. That is one point where we can learn what is going on. They can share with us what they are seeing, and we can share what we are seeing.

Broader across the Government, we can then develop strategies. Is it better to identify all the terminals which should be left on, or should we identify terminals that should be turned off? Different types of approach to list. We have done that with them.

Senator WARREN. Okay. So let me ask this maybe a little more pointedly. Do you have confidence that moving forward DOD can identify illicit Russian use of Starlink services and completely shut them off?

Mr. HILL. I think this will be a continuous problem.

Senator WARREN. I take that as a no.

Mr. HILL. I think we can continue to identify them and turn them off, but I think Russia will not stop at—

Senator WARREN. Okay. So you think it is going to be an ongoing process.

You know, war obviously is an unpredictable unfolding, but we should not have to worry about whether or not U.S. contractors are supporting our adversaries or giving access to our adversaries, and

my understanding is that Space Force is negotiating an extension of its Starlink contract with SpaceX.

Mr. Hill, can you assure me that as you renegotiate this contract that you will have provisions in place that will require SpaceX to do everything within its ability to prevent illicit use by Russia and other forces?

Mr. HILL. Our contracts, in conjunction with the licenses that regulatory agencies provide—DOD does not control those—together they ensure what you are looking for, in terms of if SpaceX complies with our contracts and they comply with the licenses that they have from regulatory agencies, who can enforce those licenses, and the various civil and criminal—

Senator WARREN. Okay. I just want to make sure I am understanding it, and I get it, we are in an unclassified setting here. The devil is always in the details. I taught contract law for many years. I would ask you to submit to the Committee the conditions that give you confidence that SpaceX is bound contractually so that it will prevent illicit use of those terminals by Russia.

I just think it is critically important that DOD hold its contractors accountable for any mismanagement or any illegal acquisition of its hardware and services by bad actors, and we just want to make sure that Russia is not getting an advantage here.

Mr. HILL. In responding to the letter that you mentioned at the outset, we will be addressing those kinds of things for you.

Senator WARREN. I appreciate it. Thank you. Thank you, Mr. Chairman.

Senator KING.

[Inaudible.]

Senator ROSEN.—Senator Cramer was next. Thank you. Well, thank you, Mr. Chairman. Thank you all for being here, for the work that you do. Really appreciate it.

I am just going to right into it and talk about Iran, Russia, and we are going to stay on this topic a little bit about Russia, but now Iran, Russia, and their space collaboration, because they are both driven by a shared interest in countering United States superiority in space, Iran and Russia. They are deepening their cooperation in space. We know, just this past February, Russia launched an Iranian satellite into orbit, and the two countries have signed an agreement for their space industries to cooperate. Iran's 10-year space program relies on Russian assistance for its operations, from launching their high payload satellites to the ultimate goal of sending an Iranian into space.

Mr. Hill, what are the security, and I am not sure if you can speak to the threat implications, but maybe the general can, knowing that we are in an open session, of the joint Iranian-Russian space cooperation, and how is the United States addressing and navigating this emerging State partnership that I think we might be worried about.

Mr. HILL. I would add it does not stop at Iran. It also involves North Korea, as we have seen with Iran and North Korea providing Russia missile to support Russia's operations in Ukraine, and then Russia likely providing them technology assistance in their programs to expand the threats that they present to us and to others.

The responses of controlling transfers of technology have their limitations. We certainly are watching what they are doing, but the ability to continue cutting off Russia, Iran and North Korea is fundamentally at the crux of it, but they are going to keep pressing on those.

Senator ROSEN. We probably need a closed session to talk about what this really entails. If you can speak to it at all. Otherwise we will wait for the closed session.

General GUETLEIN. Senator, I cannot go into the specific details. I can tell you it is troubling. We are seeing proliferation of technology. We are seeing support of launch technology, which can quickly lead to something larger like an intercontinental ballistic missile. Russia is a nuclear-armed nation. We definitely do not want that technology to proliferate. Then it also opens up additional fronts of concern during conflict.

Senator ROSEN. Thank you. I appreciate that. We will look forward to the closed session.

I am going to build on this because we have international partnerships, like they have international partnership. We have our own international partnerships, and so we work with our partners and allies. It is crucial to providing this layered, comprehensive approach that we are going to need to combat this.

The success of international cooperation was actually seen in the recent unsuccessful attack on Israel carried out by Iran and the successful shoot-down of over 300 inbound threats. That defensive action relied on sharing space capabilities with our partners in the region.

So General, can you discuss the importance of these international partnerships, as much as you can, in response to what we just asked, and really about what happened just recently. We thwarted that attack, helped to thwart that on Israel by Iran.

General GUETLEIN. Yes, ma'am. I would say our partnership, both with industry and with our allies, is one of our competitive advantages that we continue to nurture and to expand.

It is hard to be everywhere at all times. As you saw in the Middle East, there were threats coming from multiple different directions. Luckily we have spent many years working with our allies to integrate our capabilities, so that we see, they see, and that we can actually do handoffs of threats from one nation to another, and that actually paid a lot of dividends.

So going forward I would expect to see greater partnerships with our allies, not less.

Senator ROSEN. A lot of our strengths is in our partnerships and our allies and friends around the world, and that continued training and investing in that.

Speaking of investing in what you need to do all this, it relies on technology. So we have to have the technology workforce, and we have a huge shortage. There is, not just in this area but in every area of technology, it is a vital part of ensuring that every bit of our armed services is capable and prepared for the threats that are coming toward us, especially space.

So I am going to keep going back to you, General. As the newest branch of the armed services, do you currently possess and have access to the skilled workforce you need to complete your mission,

and what are the challenges that you are facing recruiting? What do we need to do to help you invest in that kind of workforce that you are going to need to enter into, to keep us safe in space?

General GUETLEIN. Thank you, Senator. As I stated a little bit earlier, our retention and our recruiting are extremely high. We are exceeding our recruiting numbers every year by several hundred.

But what is more important is the quality and the experience level of those recruits is off the charts. Most of them are a little older than their normal peers that are coming in recruiting. Fifty-three percent of them have at least a bachelor's degree or 14 hours-plus toward it. Fourteen percent of our recruits actually have a bachelor's degree or higher when we recruit them. It is a very technical workforce.

So today we are meeting those numbers. The challenge going forward is how do I grow efficiently. I cannot just accept everybody that wants to come in today and get them trained. So we are trying to balance our training resources with how many people we can recruit going forward and what is an efficient way to grow forward in the future.

Senator ROSEN. Thank you. I appreciate that. I yield back.

Senator KING. Senator Kelly.

Senator KELLY. Thank you, Mr. Chairman. I am going to start with the Secretary here. China and Russia are continuously developing anti-satellite systems, and that really concerns, I think, all of us. I want to talk specifically about one capability we have on orbit, and that is the Space Based Infrared System that we use. It is on orbit today, that we use to detect launches from the surface, often strategic ballistic missiles that could be heading in our direction, and they could be vulnerable.

I want to understand from you, Mr. Secretary, have we been thinking about the degradation and maybe denial of use of that system and what that would mean overall to our missile warning capability?

Mr. CALVELLI. Yes. Yes, we have. In fact, we are re-architecting that system and building a proliferated layer at medium Earth orbit (MEO) and a proliferated layer at low Earth orbit. In fact, it was eight satellites that we launched already for the LEO option, just against that threat. We will maintain, through orbit diversity and through proliferation, so we will maintain the geo-orbit for the near term, we will have the MEO orbit coming of age, starting in 2026, and we will have the LEO orbit starting to get populated now.

So because—you are totally correct—because of the threat against capabilities like missile warning that the Nation relies on and needs, we are fundamentally changing the architecture to build a proliferated layer at LEO and MEO that is much more highly resilient than the few big targets at GEO [Geostationary Earth Orbit].

Senator KELLY. Beyond that—we have a system that looks over the horizon with radar—beyond that, other than the orbit capability, the infrared capability we have from space, there is probably not many other ways to detect the first launch of a ballistic missile. Is that correct?

Mr. CALVELLI. I am not as familiar with our terrestrial based systems. I know from space that we rely really heavily on the old DSPs [Defense Satellite Program] as well as what is known as SBIRS [Space-based Infrared System], like you mentioned, for missile warning from space.

Senator KELLY. Yes, I am really concerned about this, because if we were to lose the Space-Based Infrared System it makes us very vulnerable to a first strike without being able to detect it.

Mr. CALVELLI. You are right. But, I mean, on the good side, sir, the Space Force has been very proactive in this area. We are funded, and we are building, and we are already starting to launch more proliferated systems that do missile warning, and add capability to also help track.

Senator KELLY. To the extent that we can talk about it in this setting, can you give us an idea of when this MEO and LEO system will be complete?

Mr. CALVELLI. Yes. So there are 8 demo satellites on orbit in LEO today that are being tested. There is another 32 that will go up over the 2025 to 2026 timeframe in LEO. That will be what we call our Tranche 1, and on the MEO side, right now we planned 9 satellites in the 2026 to 2027 timeframe.

Senator KELLY. What level of redundancy does that provide us? So what I am getting at is how many of those could we use in LEO and MEO and still retain the full capability to detect a launch from Russia or China?

Mr. CALVELLI. The system is really interesting. I think our space warfighting analysis did a great job designing it. What it is, is that they are basically independent layers. So you could take out all of one and still do the mission with the other, as an example.

Senator KELLY. You could take out the LEO constellation and you could get everything from MEO, or vice versa.

Mr. CALVELLI. Yes.

Senator KELLY. Could you take out half of the MEO satellites, as well, and get the coverage you need?

Mr. CALVELLI. You know, the beauty of proliferation is you get the coverage through having more assets. I think the more you take out, the more capability you lose, right. But building smaller systems you could replenish much quicker, as well. But obviously, sir, you are right. The more you take out, the more it hurts.

Senator KELLY. Yes. All right. Thank you. Thank you, Mr. Chairman.

Senator KING. Thank you. We will have a second round for those who are interested.

Mr. Hill, just to clarify in your exchanges with Senator Warren, is there any evidence that Starlink or SpaceX is willingly or knowingly allowing the Russians to utilize those black market terminals that they have acquired?

Mr. HILL. To the contrary. There is every evidence that when SpaceX becomes aware of things they try to work with U.S. Government to come up with the best solution for how to turn them off. To confirm, those terminals should be turned off and that they are not getting like a false positive.

Senator KING. Yes. So there is no evidence that SpaceX is, as I say, willingly trying to utilize those.

Mr. HILL. You are correct.

Senator KING. Thank you. General, you have talked several times about working with allies. It strikes me that that is one of our really asymmetric advantages. Are we working with allies also—and I suppose this could go to either of you—in terms of the development of these technologies? In other words, all wisdom on technology does not necessarily reside here, and we have got allies like Japan, the EU, Scandinavia, that we could get more out of our dollars if we are working jointly with these close allies.

General GUETLEIN. Yes, Senator, we are. We are building collaborative projects, for example, SATCOM with Luxembourg, SATCOM with Norway, PNT with Japan. So we are broadening out those partnerships on a daily basis, building ground-based radars in Australia as well as in the U.K., collaborating on launch with New Zealand.

So we are, across the board, trying to embrace our allies. I will give kudos to our folks in policy that were able to break down the classification barriers, that once we put those into place will also allow us to have broader conversations with our allies.

Senator KING. In my discussions with some of our allies, ITAR [Information Technology Acquisition Review] keeps coming up as a possible barrier. How are we dealing with that?

General GUETLEIN. I would pass that to Secretary Calvelli.

Mr. CALVELLI. Passing to John Hill. That is a State Department issue.

Mr. HILL. ITAR is always a concern allies will have if they are worried about having to incorporate U.S. technologies into systems they are developing. They worry that somehow our licensing system will prevent them doing what they want to do.

I think with respect to the question, though, of just general collaboration between the Defense Department and allies, as they grow their defense budgets to meet, for example, NATO targets, ITAR is not really a factor in that situation. We can develop the collaborative program and then work with the allies.

Senator KING. All of what we have been talking about today in terms of defense has largely been about resiliency, proliferation, many systems. The cornerstone of our defense strategy for 70 years, however, has been deterrence, that is, the adversary fears the consequences of an aggressive action against this country. Is deterrence part of our strategy in space, Mr. Secretary?

Mr. CALVELLI. I think absolutely yes, but I think one of the challenges is the classification levels.

Senator KING. Well, it is not deterrence if the adversary does not know about it.

Mr. CALVELLI. You are correct, and I will defer to General Guetlein on the Space Force on deterrence.

Senator KING. That is Dr. Strangelove 101. General?

General GUETLEIN. Senator, integrated deterrence is a foundation of our strategy. We do balance, on a day-to-day basis, what capabilities we decide to reveal and conceal, to make sure that the adversary knows that we are intent on maintaining that capability gap and protecting and defending our capabilities on a day-to-day basis.

So deterrence is the cornerstone of everything that we are trying to do. If you think back to General Saltzman, one of his core themes is Competitive Endurance. Under Competitive Endurance we would rather be in a State of constant competition and to deter aggression rather than be into a State of conflict.

Senator KING. Thank you. I have to go to another hearing. Vice Chair Fischer is going to preside, and it is over to her for a second round of questions.

Senator FISCHER. [Presiding.] Thank you, Mr. Chairman. General, again to followup with what the Chairman was talking about and tying it into the budget, I know there is a robust unfunded priorities list both from General Whiting and from General Saltzman. In this setting can you discuss some of the general capabilities that Space Force could move ahead with if you were provided with those additional resources? When we talk about deterrence that is the point of this.

General GUETLEIN. Yes, sir. Thank you, Senator. General Saltzman, earlier last month, submitted our unfunded priorities list to the tune of about \$1.15 billion. In that list was resiliency for our ground systems, power upgrades, HVAC [heating, ventilation, and air conditioning] systems what have you, because the Space Force fights from in place, so in our facilities our power and cooling is really our JPA, our fuel if you will. That is our weapons system. So he is asking for money to invest in resiliency.

He asked for money in the Working Capital Fund to move it from DISA [Defense Information Systems Agency] over to the Space Force, so that we have a business model to actually procure additional commercial capacity for our warfighters and for our Nation.

He asked for \$19 million for National Space Test and Training Center, which is building out our ability to do advanced tests and advanced training in a live, virtual, constructive environment.

He asked for \$60 million to restore the Small Launch Program so that we can provide ride shares to our industry partners and to our academic partners.

He asked for \$786 million in classified space control capabilities to ensure that we can protect and defend our capabilities on space.

He asked for \$43 million to allow the Space Development Agency to do experimentation.

Senator FISCHER. Thank you, sir, very much. Hopefully we can start to deliver on some of those.

Senator Cramer, do you have additional questions?

Senator CRAMER. I don't because [inaudible].

Senator FISCHER. Thank you. Senator Rounds, any other questions?

Senator ROUNDS. I do. Thank you, Madam Chair, or Vice Chair. For Mr. Hill and General Guetlein, are you aware of the 20-month EMBRSS [Emerging Mid-Band Radar Spectrum Sharing] study that was authorized to explore the sharing of the electromagnetic spectrum in the critical 3.1 to 3.45 gigahertz band?

Mr. HILL. I am, General?

Senator ROUNDS. Are you aware that this was a study that included the whole-of-government as well as representatives of defense contractors and the telecommunications industry?

Mr. HILL. Yes, Senator.

General GUETLEIN. Yes, Senator.

Senator ROUNDS. Are you aware of the finding of this inter-agency study group that sharing in this band between Federal and commercial systems is not feasible unless, and I quote, "certain regulatory, technological, and resourcing conditions are met and implemented"?

General GUETLEIN. Yes, Senator.

Mr. HILL. Yes, Senator.

Senator ROUNDS. Are you also aware that the estimate of this interagency study was that implementing the conditions could take 30 years and \$260 billion in this portion of the electromagnetic band alone, even if the very stringent conditions were able to be met?

General GUETLEIN. Yes, Senator.

Mr. HILL. Yes, Senator.

Senator ROUNDS. Are you also aware of the legislative proposals in the Commerce Committee calling for the use of the 728 gigahertz band to the spectrum, where the Space Force and other services maintain similarly critical systems for the defense of our country?

General GUETLEIN. Yes, Senator.

Mr. HILL. Yes, Senator.

Senator ROUNDS. Can you tell this Subcommittee where you stand on these efforts, if they proceed forward without the most stringent conditions, such as the development and implementation of the Dynamic Spectrum Sharing, the interference safeguards, and a massive influx of Federal resources to maintain the defense of this country?

General GUETLEIN. Senator, spectrum is vital to our way of life. It is actually a natural resource just like water or air, and just like water or air, we need to protect that vital resource. We need to make sure it is not contested, we need to make sure it is not polluted, and we need to make sure it is not controlled.

If you look at the 7 to 8 gigahertz spectrum band that you are talking about, that is where most of our NC3, so our nuclear command and control capabilities, lie. Those systems have been purposely designed for that spectrum, and if we were pushed outside of that spectrum, those systems that took us decades to develop and billions of dollars to develop would have to be reconstituted in some sort of fashion.

If you look at just the wideband gapfiller system, we have 10 of those on orbit today, they cost about \$600 million apiece. Each one of those takes 4 years to develop. Just looking at just that one piece of the architecture for wideband gapfiller, that is \$6 billion and at least a decade to reconstitute, to assume that we could even find another spectrum that it could operate. You amplify that across all of our capabilities and you start to see the large numbers that you just talked about in that study. So it would be detrimental to us to lose that spectrum.

Senator ROUNDS. Mr. Hill, anything to add to that?

Mr. HILL. That was an excellent summary of how we use it. The national security community, Defense Department, intelligence community, when we have been allocated spectrum we have in-

vested heavily to utilize that spectrum. The Nation has tremendous investments that are put at risk if we carelessly start reallocating spectrum. The national security community needs to be at the table whenever this conversation comes up.

Senator ROUNDS. Would you suspect that our adversaries would love to see us try to disrupt our ability to use those specific bands?

General GUETLEIN. Absolutely.

Mr. HILL. Our adversaries always like to see us disrupt ourselves.

Senator ROUNDS. We have met the enemy, and sometimes the enemy is us.

One other thought. I note also that in the 3.1 to 3.4 gigahertz area the LRDR, or the long range discriminating radar, actually sits in that band, as well, does it not?

General GUETLEIN. It does, and that is our last line of defense to protect the Homeland from a nuclear launch from North Korea.

Senator ROUNDS. Thank you. Thank you, Madam Chair

Senator FISCHER. Thank you, Senator Rounds, for opening up that line of discussion, I would just follow that up, as a member of the Commerce Committee, that there are some bills out there that look at spectrum auctions. There are deep concerns by many Members, obviously on Armed Services Committee, but on Commerce Committee, as well.

Do you believe wise, in fact, it would be vital for Senators before moving on any kind of legislation to have auction in the bands that were discussed previously by Senator Rounds, that they would at least contact DOD for technical advise?

General GUETLEIN. Yes, Senator.

Mr. HILL. Yes. The Defense Department needs to be part of the conversation.

Senator FISCHER. Thank you. As you said, this is a national security issue, and it would be detrimental for us to lose access of that spectrum for our security. Am I restating that correctly?

General GUETLEIN. Yes, Senator. It would be detrimental for us to lose access to that natural resource.

Mr. HILL. Correctly and more succinctly than I usually do.

Senator FISCHER. You did a nice job, Mr. Hill. Thank you very much. Anything else from Senators that are present?

Thank you very much, and with that I thank our panel for being here. I look forward to continuing our discussions, and the hearing is adjourned. Thank you.

[Whereupon, at 10:42 a.m., the Subcommittee adjourned.]

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR ANGUS KING

SPACE ACQUISITION TENETS

1. Senator KING. Secretary Calvelli, as I mentioned in my opening statement, in October 2022, you issued your "Space Acquisition Tenets," which contains nine tenets to guide your acquisition professionals. A long-standing issue has been putting satellites up in space before the ground systems are complete to use the data. Can you give us an example of what ground systems you are talking about and why this is important?

Secretary CALVELLI. One of my priorities is to ensure that the space and ground segments come together as a system. We need to proactively drive ground systems to be ready before launch. Not having ground systems ready delays our ability to

use new satellite capabilities. One way to reduce risk and drive timely deliveries is to avoid building large complex monolithic ground software systems. Instead, as we architect future ground systems, they must be broken up into smaller less complex software development systems to reduce risk and add speed.

The Global Positioning System Next-Generation Operational Control System (GPS OCX) program is a prime example of how difficult it is to tackle a single complex command and control system and large monolithic software development projects at the same time. This single acquisition of multi-million lines of software code is years late and overrun.

The Space Development Agency (SDA) is working to ensure their ground infrastructure, including two new network operations centers, is on track for delivery to support all their Tranche 1 tracking satellites. Space Systems Command architected their Future Operationally Resilient Ground Evolution (FORGE) missile warning ground systems into more manageable smaller contracting elements, to include a mission framework, mission processing, mission scheduling. Similarly, the ground for the new Evolved Strategic SATCOM (ESS) program has also broken their ground software into smaller elements.

SPACE FORCE TRAINING

2. Senator KING. General Guetlein, training is essential for any warfighting service. It develops competency and projects deterrence to our adversaries. How does the Space Force train? Is it a mix of actual training in space and simulations here on the ground?

General GUETLEIN. The Space Force (USSF) conducts a mixture of training in both the space and ground segments of our systems. Operational Test and Training Infrastructure (OTTI), a critical component to the USSF's ability to generate readiness for Great Power Competition, provides an integrated system of systems architecture enabling guardians to test and train in an operationally relevant manner to achieve and sustain combat readiness. OTTI was formally established within the USSF in 2023 and includes: 1) high-fidelity mission-specific simulators, 2) live and synthetic "ranges" which are part of the National Space Test and Training Complex (NSTTC), 3) live and synthetic aggressor forces, and 4) interoperability with other joint, federated capabilities such as the Joint Simulation Environment (JSE).

For example, the NSTTC unifies operations of the Electromagnetic Range, Orbital Warfare Range, Cyber Warfare Range, and the Digital Warfare Environment for a broad range of integrated test and training activities. Each of the ranges and the digital environments are operated by units dedicated to providing customers with a safe and secure environment supporting test, training, exercise, and experimentation activities in the varied space and cyber domains.

In addition, Space Operations Command (SpOC) has implemented scenarios via Table Top Seminars that enable us to quickly identify and close qualitative gaps in operational readiness with respect to Doctrine, Concepts, Training; OTTI capability needs; Concepts of Operations (CONOPS); Concepts of Employment (CONEMPs); Command & Control; Tactics, Techniques, and Procedures (TTPs); and crossField Command dependencies. The use of scenarios has improved the Space Force's ability to present fully burdened, combat credible space forces to the Joint Force commander. These scenarios, called FLASHPOINT, are based upon the environment established in the Space Force's Space Flag exercise—the training event proposed by Congress in the Fiscal Year 2018 NDAA (Sec. 1615). In 2017, the Air Force (USAF) held the first Space Flag. USSF now holds Space Flag exercises executed by Space Training and Readiness Command (STARCOM). Space Flag validates the environment, scenario, and operator responses, and enables SpOC to meet Space Force Generation (SPAFORGEN) certification requirements.

SPACE BASED TACTICAL INTELLIGENCE SURVEILLANCE AND RECONNAISSANCE

3. Senator KING. General Guetlein, the Air Force is phasing out our Joint Surveillance Target Attack Radar System (JSTARS) radar aircraft, which performed Ground Moving Indication (GMTI) as well as our E-3 Airborne Warning and Control System (AWACS) aircraft, which perform Air Moving Target Indication (AMTI). The Space Force will be taking on this mission with space-based platforms. This has traditionally been a title 10 mission for the Air Force now this will be the Space Force. Last year's National Defense Authorization Act gave the tasking authority for tactical space-based intelligence, surveillance and reconnaissance to the Air Force and hence the Space Force. What issues do you see in this transition from air to space in terms of mission?

General GUETLEIN. The transition of Moving Target Indication (MTI) capabilities from airborne to space assets involves the following considerations:

- Integration into Joint processes and systems: The Space Force is collaborating with the Services, Combatant Commands, Defense Agencies, and the Intelligence Community (IC), in a complementary way to design, develop, and deploy Space-Based Ground Moving Target Indicator (SB-GMTI) systems that meet validated requirements and inform future budget considerations, with a primary focus on the ground architecture necessary to enable orchestration, Department of Defense (DOD) tasking & target custody, and doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) requirements. SB-GMTI will provide actionable information on potential adversary targets to the warfighter through the Department of the Air Force (DAF) Battle Network, DAF's primary contribution to Combined Joint All-Domain Command and Control (CJADC2).
- Facilitating a shift in thinking that SB-GMTI capabilities are not intelligence collection-oriented but are instead tactical and operationally intended for direct tactical and operational support to the Combatant Commands. The core function of SB-GMTI is to close kill chains and facilitate beyond line-of-sight battle management within Joint Long-Range Kill-Chain time requirements. SB-GMTI will aid Combatant Commands in the ability to Find, Fix, Track, Target, support Engagement through In Flight Target Updates (IFTUs), and Assess F2T2EA potential threats through competition, crisis, and conflict.
- Deconfliction of Combatant Command collection operations authorities; the USSF is not creating a new process or advocating to be the Collection Management Authority for the Combatant Command. The USSF will assign forces to the Combatant Commands to manage, plan, execute, and task systems, just as the Joint Forces Air Component Commander (JFACC) would for theater airborne Intelligence, Surveillance, and Reconnaissance (ISR). SB-GMTI forces will integrate into Combatant Command collection working groups, boards, and development processes to effectively integrate, synchronize, and dynamically manage the Combatant Command's SB-GMTI allocation in support of Joint Force objectives.
- Reorganization of United States Space Force (USSF) forces to fulfill new mission areas; the USSF's force presentation, at Full Operational Capability, will focus on Global and Regional Operations. Global Operations, conducted by a Global Combat Squadron assigned to the United States Space Command (USSPACECOM), via the United States Space Forces - Space (S4S), will be responsible for: 1) global mission management (including managing vehicle duty cycles and interfacing with IC partners); 2) execution of the global allocation plan (including coordination of the plan in accordance with (IAW) Secretary of Defense priorities and monitoring of regional capacity allocations); and 3) global reach back (in support of dynamic reallocation between Combatant Commands where needed and to provide notifications of anomalous constellation conditions). Regional Operations will be conducted by the Regional Elements within the Space Force Service Component Commands assigned to each Combatant Command. Teams of guardians will facilitate constellation tasking IAW Combatant Command J2/J3 direction, develop intra-theater strategies, verify data to command-and-control nodes, and provide sensor feasibility assessments and usage recommendations.

4. Senator KING. General Guetlein, how will this legislation ensure the combatant commander has the same military tasking ability today that he will have with space?

General GUETLEIN. In accordance with Section 1684 of the Fiscal Year 2024 National Defense Authorization Act, the Secretary of the Air Force has the responsibility for presenting ground and airborne moving target indication systems that are funded by the Department of Defense (DOD) and provide near real-time support to combatant commands. Space-Based Ground Moving Target Indicator (SB-GMTI) systems meet this responsibility as military surveillance and reconnaissance capabilities that will be presented by the USSF to the combatant commands to close kill chains and facilitate beyond line-of-sight battle management within Joint Long-Range Kill-Chain time requirements. SB-GMTI is not a one-for-one swap for the retired E-8C JSTARS's sensing capabilities; rather it is an evolved weapon system that serves as the next generation moving target indicator for the warfighter, raising a large majority of that capability to space. SB-GMTI will facilitate access and persistence in highly contested environments.

The intent of SB-GMTI is to enhance and expedite near real-time support to Combatant Commands. The best way to enhance that support is to integrate to the greatest extent possible into Combatant Command processes. We need to bring the

system tasking and requirements validation capabilities directly under the purview and control of the Combatant Commands. The DOD's method for doing this, in doctrine and practice, is via Service presentation of capabilities and personnel via Service components. Combatant Commands will receive trained, experienced, and knowledgeable forces to integrate directly at all levels of operations. This integration enables requirements and tasks to be more responsive to and more aligned with warfighter needs on a deliberate and dynamic basis.

5. Senator KING. Secretary Calvelli, you served many years in the National Reconnaissance Office and the intelligence community has capabilities in this area. From an acquisition and tasking stand point what is most important to you to ensure the capabilities you will develop remain title 10 capabilities?

Secretary CALVELLI. I am in constant communication with my Intelligence Community partners to ensure we are mutually adhering to the policies governing the acquisition and tasking of title 10 and title 50 space capabilities. Given the threats to national security posed by our competitors, it is imperative that we avoid duplication of effort while simultaneously leveraging capabilities to efficiently and affordably meet the full range of national security requirements.

Space-based Ground Moving Target Indicator (SB-GMTI), a joint venture between the United States Space Force and National Reconnaissance Office, benefits and reinforces collaboration between the Department of Defense (DOD) and Intelligence Community. The Secretary of Defense and the Director of National Intelligence (DNI) have agreed that 100 percent of the SB-GMTI is allocated and tasked by the DOD.

6. Senator KING. Mr. Hill, the JSTARS and the E-3 AWACS are used by NATO and other allies, as their aircraft also age out will they use our space based assets without deploying their own?

Mr. HILL. NATO Allies and non-NATO Allies are increasing investments in intelligence, surveillance, and reconnaissance (ISR), and other space-based defense systems. They desire to invest in ways that maximize interoperability with U.S. space systems.

For NATO Allies, this approach advances objectives of NATO's overarching Space Policy, which recognizes that, "[i]ntelligence, surveillance and reconnaissance requires space capabilities for strategic, operational and tactical assessment, situational awareness and to support decisionmaking and planning." NATO's policy also states that, "NATO will identify and, if necessary, develop appropriate mechanisms, based on voluntary participation, to fulfil and sustain requirements for space support in NATO operations, missions and other activities in the above functional areas. Allies' capabilities, and, if necessary, trusted commercial service providers should be leveraged to meet these requirements in the most secure, efficient, effective and transparent manner."

I see these trends in allied investments, and the establishment of the NATO space policy, as providing the foundation for coordinating space domain investments in ISR and other space capabilities in ways that are analogous to what has been done in the air domain.

SPACE FORCE ARCTIC BASES

7. Senator KING. General Guetlein, my understanding is you have installations in pretty austere conditions, let me zero in on ones that are in arctic areas—the one that comes to mind is Pituffik Space Force Base, formerly Thule Space Force Base. Others are in my home State in Prospect Harbor and as well as large radar at Clear Space Force Base Alaska. At Pituffik my understanding is the extreme cold is impacting your ability to generate power and have adequate housing for your guardians. Can you describe what you are doing at Pituffik to ensure the infrastructure is maintained?

General GUETLEIN. Pituffik Space Base, Greenland is an unaccompanied assignment and guardians and airmen live in dorms where there is a surplus of bed spaces. All dorms meet the Office of the Secretary of Defense (OSD)-required facility condition index.

The Space Force prioritizes requirements through our own governance. Specifically, at Pituffik Space Base, a \$310 million project was awarded in fiscal year 2024 to repair the power plant that directly supports the Upgraded Early Warning Radar (UEWR). Additionally, a \$225 million project to replace the main power plant at Pituffik is programmed for fiscal year 2030. Furthermore, in fiscal year 2024 we will complete a \$2.5 million arctic foundation repair on the mission control building that

supports UEWR and a \$24 million repair to a high-rise dormitory that houses permanent party personnel.

The Department of the Air Force (DAF) Climate Action Plan drives the Space Force's climate and resilience strategy. We have the unique goal of employing a holistic approach to enterprise-wide solutions based on specific locations. Our strategy defines climate resilience as the ability to anticipate, prepare for, and respond to hazardous events, trends, or disturbances related to climate. To combat these growing threats, planners take into consideration the effects of climate and severe weather when planning for infrastructure resiliency in accordance with the DAF's Severe Weather and Climate Hazard Screening and Risk Assessment Playbook. To take full advantage of climate-informed decisions, the Space Force continually acquires improved extreme weather sensing solutions and develops expertise in the analysis of authoritative climate and extreme weather data. The department also continues to develop secure, digitally integrated infrastructure to minimize vulnerabilities and interruptions to our facility control systems, including power distribution. Our strategy maximizes the use of existing and future technology to improve our use of information to better protect our installations. By addressing challenges using a holistic enterprise approach we are better postured to leverage experience as we mature as a service. Because of the geographical separation between our installations, the Space Force must create customized climate and severe weather solutions based on specific locations. Space Force takes advantage of the planning process and standards set up by the DAF's severe weather playbook to help customize solutions to each threat based on location.

8. Senator KING. General Guetlein, can you describe what you are doing at Space Force installations and assets located in Alaska to ensure the infrastructure is maintained?

General GUETLEIN. Because of the geographical separation between our installations, the Space Force must create customized climate and severe weather solutions based on specific locations. The Space Force takes advantage of the planning process and standards set up by the Department of the Air Force's (DAF's) severe weather playbook to help customize solutions to each threat based on location.

At Clear Space Force Station, Alaska, a \$72 million project was awarded in fiscal year 2023 to construct a new dormitory to support the new Long Range Discrimination Radar mission. Additionally, a \$22 million project was awarded in fiscal year 2024 to repair the utility piping in utilidor and in fiscal year 2028 we plan to construct a \$6 million new composite steam plant. All requirements will include climate informed decisions to make our installations more resilient. Furthermore, the DAF conducted an Energy Resilience Readiness Exercise (ERRE) at Clear SFS in fiscal year 2023 and plans to conduct another ERRE in fiscal year 2027. The ERREs are critical to aiding the DAF in determining infrastructure improvement opportunities to ensure operational mission readiness.

9. Senator KING. General Guetlein, what challenges do you have with maintaining infrastructure in the high north?

General GUETLEIN. Base infrastructure across the northern tier is a central component to Space Forces' power projection. The climate of the High North region presents challenges to maintaining the service's infrastructure. To survive in the High North region, materials need to meet standards including high thermal efficiency, long-term durability, tolerance to repeated freeze and thaw cycles, and resistance to permafrost degradation.

At Clear Space Force Station (SFS), a \$72 million project was awarded in fiscal year 2023 to construct a new dormitory to support the new Long Range Discrimination Radar mission. Additionally, a \$22 million project was awarded in fiscal year 2024 to repair the utility piping in utilidor and in fiscal year 2028 we plan to construct a \$6 million new composite steam plant. All requirements will include climate informed decisions to make our installations more resilient. Furthermore, the Department of the Air Force (DAF) conducted an Energy Resilience Readiness Exercise (ERRE) at Clear SFS in fiscal year 2023 and plans to conduct another ERRE in fiscal year 2027. The ERREs are critical to aiding the Department in determining infrastructure improvement opportunities to ensure operational mission readiness.

At Pituffik Space Base, a \$310 million project using Operations & Maintenance (O&M) funds was awarded in fiscal year 2024 to repair the power plant that directly supports the Upgraded Early Warning Radar (UEWR). Furthermore, in fiscal year 2024 we will complete a \$2.5 million arctic foundation repair on the mission control building that supports UEWR and a \$24 million repair to a high-rise dormitory that houses permanent party personnel.

By addressing challenges using a holistic enterprise approach we are better positioned to leverage experience as we mature as a service. Because of the geographical separation between our installations, Space Force must create customized climate and severe weather solutions based on specific locations. Space Force takes advantage of the planning process and standards set up by the DAF's severe weather playbook to help customize solutions to each threat based on location.

QUESTIONS SUBMITTED BY SENATOR JACK REED

NATIONAL SECURITY SPACE LAUNCH PHASE III

10. Senator REED. Secretary Calvelli, in an October 5, 2023 Space Systems Command (SSC) press release regarding National Security Space Launch Phase 3, you stated "As we continue to drive speed in our acquisitions, National Security Space Launch (NSSL) Phase 3 is critical to our ability to put new space capabilities on orbit quickly. I am extremely proud of the SSC team and the innovative work they have done to define a new dual-lane approach to launch, and the addition of a third launch service provider in Lane 2. This next phase of the NSSL acquisition will serve the Nation well and allow us to further transform our space capabilities to outpace our competitors." Can you further explain how this will this launch strategy, which includes a third launch provider for higher energy orbits, will help the United States maintain our competitive advantage over our near peer adversaries?

Secretary CALVELLI. My number one priority is to put space capability in the hands of the warfighter when and where it is needed. To maintain a competitive advantage over our adversaries, we need launch resiliency. We structured the Phase 3 launch strategy to increase resiliency by giving us access to a diverse portfolio of launch providers and launch systems.

The National Security Space Launch (NSSL) Phase 3 program is using an innovative dual-lane acquisition approach to fulfill NSSL program needs by competitively awarding two separate contract types. Lane 1 provides access to diverse emerging commercial offerings for the more risk-tolerant missions using tailored mission assurance levels. Lane 2 ensures assured access to space for the hardest, "no-fail" missions by placing a priority on meeting all NSSL requirements, including full government mission assurance with NSSL-certified launch vehicles. Having three providers in Lane 2 also secures national security launch capacity in the face of a growing commercial market.

QUESTIONS SUBMITTED BY SENATOR ELIZABETH WARREN

STARLINK

11. Senator WARREN. Mr. Hill, in response to my questions about strategies to end illicit use of Starlink, you testified that "Broader across the government, we can then develop strategies. Is it better to identify all the terminals that should be left on or should we identify terminals that should be turned off? Different types of approaches. We have done that with them." Specifically, which approach have you taken?

Mr. HILL. We understand that SpaceX, in coordination with the United States Government, uses a hybrid approach that combines factors for which terminals should be "left on" and which terminals should be "turned off" in seeking to prevent illicit use of Starlink terminals in Ukraine.

12. Senator WARREN. Mr. Hill, does Starlink use a strategy in which they identify all terminals that should be left on, or do they identify terminals that should be turned off?

Mr. HILL. We understand that SpaceX uses a hybrid approach to address illicit use of Starlink terminals in Ukraine. SpaceX has coordinated its approach with the United States Government, which includes routine monitoring in an effort to thwart suspected illicit users.

13. Senator WARREN. Mr. Hill, does SpaceX have the capacity to identify if one of its Starlink terminals is being used in an illicit manner?

Mr. HILL. We understand that SpaceX, in coordination with the U.S. Government, uses a hybrid approach that combines factors for which terminals should be "left on" and which terminals should be "turned off" in an effort to prevent illicit use of Starlink terminals. SpaceX performs these activities on a recurring basis without requiring consultation with the U.S. Government.

14. Senator WARREN. Mr. Hill, has SpaceX shut off illicitly used Starlink terminals when identified and requested by the Department of Defense? If yes, how quickly have they done so?

Mr. HILL. From our perspective, SpaceX has fully cooperated with the United States Government and the Government of Ukraine to support investigations and to deny service to suspected illicit users. SpaceX has a record of taking prompt action when illicit use is identified.

15. Senator WARREN. Mr. Hill, is SpaceX identifying if its terminals are being used illicitly? How quickly are they disabling terminals once that illicit use is identified?

Mr. HILL. We understand that SpaceX, in coordination with the U.S. Government, uses a hybrid approach that combines factors for which terminals should be “left on” and which terminals should be “turned off” in an effort to prevent illicit use of Starlink terminals. SpaceX has a record of taking prompt action when illicit use is identified.

16. Senator WARREN. Mr. Hill, does the Department of Defense believe illicit use of Starlink terminals has helped any foreign adversaries identify vulnerabilities in those terminals or other commercial capabilities?

Mr. HILL. Yes.

17. Senator WARREN. Mr. Hill, does the Department of Defense believe illicit use of Starlink terminals has helped any foreign adversaries compromise or intercept NATO partner or Ukrainian communications?

Mr. HILL. We have no evidence to suggest that illicit use of Starlink terminals has helped any foreign adversaries compromise or intercept NATO partner or Ukrainian communications.

18. Senator WARREN. Mr. Hill, the Washington Post reported that Russian electronic jamming cutoff video feeds for Ukraine’s 125th Territorial Defense Brigade. Who does the Department of Defense assess to be responsible for the jamming?

Mr. HILL. We assess that Russian electronic jamming was responsible for the reported effects.

19. Senator WARREN. Mr. Hill, is the Department of Defense able to share all of the information it receives about Starlink vulnerabilities or jamming with SpaceX?

Mr. HILL. The Department of Defense works with the Intelligence Community to share with SpaceX, as appropriate, information received about Starlink vulnerabilities or jamming.

20. Senator WARREN. Mr. Hill, has the Department of Defense or SpaceX identified how to prevent future jamming of Starlink terminals? Has that fix been implemented?

Mr. HILL. Russian electronic warfare techniques and capabilities will continue to evolve and adapt. The Department of Defense and its suppliers of commercial satellite communications services, including Starlink services, likewise are continuously identifying and implementing ways to operate through jamming environments.

QUESTIONS SUBMITTED BY SENATOR TOM COTTON

SPACE LAUNCH CAPABILITIES

21. Senator COTTON. General Guetlein, I am glad to see from your testimony that the number of commercial space launches on Federal ranges continues to increase, why is it important that the Department of the Air Force facilitate private-sector investment in our Nation’s Federal launch ranges and how does the Department ensure that the commercial deployment of national security infrastructure on Federal ranges is not delayed by environmental approvals?

General GUETLEIN. The Department of the Air Force (DAF) promotes partnerships with private sector companies, providing them access to develop and operate launch sites on Federal ranges to facilitate the expansion of launch technology, commercial sector development, and increased launch provider diversity. This collaboration allows industry to utilize government expertise and maximize the use of common infrastructure. The DAF ensures appropriate consideration of environmental protection as we grow and execute our missions largely through the National Environmental Policy Act (NEPA) planning process, ensuring collaborative decisionmaking

with launch service providers and regulatory and permitting/licensing agencies, and obtaining public input. Environmental analyses and varying degrees of regulatory permitting are required for any new launch site operation regardless of location. For example, the DAF and Department of Defense must follow the procedural requirements under NEPA, preparing, managing, and documenting the appropriate analyses (such as Environmental Assessments and Environmental Impact Statements) to meet timelines to the greatest extent practicable. Public participation is a critical element of this process. The DAF makes every reasonable effort to collaborate and utilize its expertise as well as that of regulatory and permitting/licensing agencies and launch service providers so that its environmental reviews are timely, efficient, thorough, and informed.

22. Senator COTTON. General Guetlein, how does the Department of Air Force ensure that commercial operators can access accelerated environmental approvals for privately funded infrastructure improvements on Federal ranges that are in support of national security space launch capacity, and how can we ensure that environmental approval timelines for these activities are aligned with the threats we face from foreign adversaries?

General GUETLEIN. There is an escalating demand for national security space launch capacity amid growing international threats. Compliance with mandatory Federal, State, and local environmental regulations limits the pace of completing environmental reviews for launch site development. The regulations often pose challenges for commercial operators in accessing accelerated environmental approvals for privately funded infrastructure improvements on Federal ranges. While some Federal environmental laws provide exemptions for national security needs, the National Environmental Policy Act (NEPA) does not, and the Department of the Air Force (DAF) must therefore abide by its requirements.

The DAF remains committed to ensuring environmental review processes can meet the demands of launch activities while preserving necessary environmental protections. Although the DAF is typically the lead agency for environmental review of Space Force spaceport developments, we lack direct authority to change or remove other agencies' environmental requirements including State, regional, and local requirements authorized by Federal legislation. DAF resources necessary to support coordination with other agencies, particularly for commercial (Federal Aviation Administration (FAA)-licensed) launch activity, become increasingly complex and time-consuming due to increasing launch demand.

TACTICAL DATALINKS FROM SPACE BETWEEN AIR, LAND, AND SEA PLATFORMS

23. Senator COTTON. General Guetlein, do you have the spectrum authority today you need to develop, test, and operationally use on-orbit tactical datalinks, such as Link-16, in congested parts of the spectrum for daily and regular training with other Department of Defense land, air, sea platforms?

General GUETLEIN. The Department of Defense (DOD) does not have the spectrum authority needed to test and operate space-based Link-16. The DOD is currently limited to testing and operating the Link-16 systems it has on orbit in international waters and over some parts of Australia via International Telecommunication Union (ITU) waivers granted by the National Telecommunications and Information Administration (NTIA). This authorization is set to expire at the end of Calendar Year 2024. As testing and operational use are restricted to these test sites, it limits the ability of the DOD to test, evaluate, and integrate space-based Link-16 into training events reducing the "training-as-we-fight" concept.

24. Senator COTTON. General Guetlein, in your best military advice, what policies today slow down your ability to rapidly certify and use tactical datalinks or communication systems?

General GUETLEIN. The Federal Aviation Administration (FAA) requires all Link-16 equipped systems to complete Electromagnetic Compatibility Features (EMCF) validation before any testing over the United States. The National Telecommunications and Information Administration has the authority to allow testing, but it has deferred to the FAA. This FAA requirement for full EMCF validation by the Department of Defense (DOD), often a multi-year process, ahead of testing extends the timeline to field all Link-16 equipped weapon systems. The requirement to complete EMCF validation before conducting on-orbit testing over the United States add at least a year to fielding these tactical space-based systems. With no authorities to test and operationalize space-based Link-16, development of Tactics, Techniques, and Procedures (TTPs) has been restricted and available DOD combat power has been reduced. The FAA has previously granted a Temporary Frequency Assignment

(TFA) for the purpose of testing terrestrial Link-16 systems without EMCF validation. The Department would welcome similar opportunities to test space-based Link-16 systems domestically.

Another policy impediment is the lack of a national or international allocation for space-based Link-16. Lack of an allocation for space-based Link-16 complicates all spectrum allocation efforts for these systems even if the radios are nearly identical to Link-16 radios fielded on airframes. The first step is for the National Telecommunications and Information Administration (NTIA) to provide space-based Link-16 an allocation in their Manual of Regulations and Procedures for Federal Radio Frequency Spectrum Management. Then the United States could pursue an international allocation for space-based Link-16 through the World Radiocommunications Conference.

25. Senator COTTON. Secretary Calvelli, you mentioned in your opening statement that the Space Development Agency demonstrated Link-16 from space, but is this a just demo or is it a capability with a clear path to fielding; and if the later, what is the plan to fully certify transmit and receive of Link-16 over the United States National Airspace System and field it as soon as possible so that all joint platforms can benefit?

Secretary CALVELLI. The Space Development Agency (SDA)'s Proliferated Warfighter Space Architecture (PWSA) Tranche 0 constellation is designed to serve as a warfighter immersion layer to expose the operational community to the tremendous value of space-based Link-16 and develop a path to full fielding of the capability. Link-16 demonstrations conducted overseas using Tranche 0 satellites will lead to the operational deployment of Link-16 as part of Tranche 1, which will field 126 Link-16 equipped satellites in 2025 to support persistent regional access to space-based Link-16. This operational access will be further expanded in 2027 with the deployment of Tranche 2 which will provide global access to space-based Link-16. Current analysis and on orbit testing of Tranche 0 Link-16 assets has shown no harmful interference to aeronautical systems. SDA is working with the military Services and Combatant Commands to develop the doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) for operationalizing space-based Link-16.

26. Senator COTTON. Secretary Calvelli, I am led to believe that the Space Development Agency tranche 0 and tranche 1 communication satellites were required to test their Link-16 tactical datalink capability in Australia because the Federal Aviation Administration would not work with the Space Force; is this true?

Secretary CALVELLI. The Department of the Air Force (DAF) is working with the National Telecommunications and Information Administration (NTIA), Department of Transportation, and the Federal Aviation Administration (FAA) to meet the various requirements to gain authorization for the Space Development Agency (SDA) to test space-based Link-16 systems in the United States. SDA obtained approval to perform the Tranche 0 tests in Australia and in international waters after the FAA denied a temporary authorization for very limited testing over a United States military test range without first successfully completing the Electromagnetic Compatibility Features (EMCF) validation. SDA asked the FAA to waive this requirement by proposing restricted domestic tests during times when civil air traffic is limited, but FAA sees the EMCF validation as essential. SDA currently plans to test all Tranche 0 and Tranche 1 Link-16 systems outside of the U.S. National Airspace System.

27. Senator COTTON. Secretary Hill, what is the Department of Defense leadership doing to advocate for the full certification of Link-16 transmit and receive from space given the ongoing roadblocks from the Federal Aviation Administration and outdated policies not in compliance with Section 228 of the Fiscal Year 2024 National Defense Authorization Act?

Mr. HILL. The requirements and methodologies to meet the Federal Aviation Administration's (FAA) Electromagnetic Compatibility Features (EMCF) validation were unchanged by Section 228 of the National Defense Authorization Act for Fiscal Year 2024. The FAA continues to require full EMCF validation of each Link-16 system before it will provide authorization for domestic testing or operation.

The Department of Defense (DOD) requires FAA authorization to test and operate space-based Link-16 within the United States. Due to FAA restrictions that prevent broadcasting Link-16 from space into the U.S. National Airspace System, the DOD is limited to testing and operating the Link-16 systems it has on orbit in international waters and over approved areas of partner nations via International Telecommunication Union (ITU) waivers granted by the National Telecommunications

and Information Administration (NTIA). Using one such waiver, the Space Development Agency (SDA) successfully demonstrated the first-ever Link 16 network entry through space to ground connection from low Earth orbit (LEO) to a series of receivers using terrestrial radios during three demonstrations held November 21–27, 2023. However, restricting testing and operational use to these sites limits the ability of the DOD to test, evaluate, and integrate space-based Link-16 into training events. Further, the current test waiver is set to expire at the end of 2024.

QUESTIONS SUBMITTED BY SENATOR TOMMY TUBERVILLE

MULTIYEAR BLOCK BUYS

28. Senator TUBERVILLE. Secretary Calvelli, according to the April 2022 Department of Defense (DOD)—Selected Acquisition Report (SAR) that was sent to Congress: “The Phase 2 competitive acquisition award adds to the considerable savings the NSSL [National Security Space Launch] program has achieved since the 2013 Phase 1 Block Buy contract award. The NSSL program garnered these savings by creating new acquisition strategies, procuring launch services in economic order quantities, and fostering robust competition precipitated by investments in new commercial launch systems that also meet more stressing NSSL needs.” Moreover, the NSSL program has returned approximately \$7 billion to the warfighter, allowing the Air Force, Space Force, and National Reconnaissance Office (NRO) to fund additional, much-needed capabilities. During the House Armed Services Hearing hearing couple weeks ago, Mr. Calvelli noted that the Space Force utilized multi-year Block Buys in Phase 2 and lane 2 for Phase 3, but stopped short of commenting on whether multi-year block buys will be the standard in future procurements. Given the success they have had in the past and the benefits they have brought to the industrial base, can you confirm that multi-year block buys will continue to be utilized in all future procurements for NSSL beyond Phase 3?

Secretary CALVELLI. Block buy contracting strategies, coupled with re-introducing competition into National Security Space Launch (NSSL), has yielded tremendous savings and other benefits. We awarded the first NSSL Phase 3 Lane 1 On-Ramp in June 2024, and we anticipate awarding Lane 2 contracts by this fall. After Lane 2 is awarded, the Space Force will continue to assess the commercial market, NSSL future needs, and lessons learned/best practices from Phase 3 to shape future acquisition strategies.

**DEPARTMENT OF DEFENSE AUTHORIZATION
FOR APPROPRIATIONS FOR FISCAL YEAR
2025 AND THE FUTURE YEARS DEFENSE
PROGRAM**

WEDNESDAY, MAY 22, 2024

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

**THE DEPARTMENT OF ENERGY'S ATOMIC ENERGY DE-
FENSE ACTIVITIES AND DEPARTMENT OF DEFENSE
NUCLEAR WEAPONS PROGRAMS**

The Subcommittee met, pursuant to notice, at 4:50 p.m. in room SR-222, Russell Senate Office Building, Senator Angus King (Chairman of the Subcommittee) presiding.

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

OPENING STATEMENT OF SENATOR ANGUS KING

Senator KING. This hearing on the Department of Energy Atomic Energy Defense Programs, and Department of Defense Nuclear Weapons Programs of the Armed Services Committee Subcommittee on Strategic Forces will come to order. I want to thank our witnesses for appearing here today and for their service to our Nation.

I first want to welcome Admiral Houston, our eighth director of Naval Reactors to the subcommittee, and we look forward to hearing from you over the next 8 years. Thank you, Admiral. Congratulations.

Today's hearing consists of two panels to review the budget request for Defense nuclear activities at the Department of Energy and the Department of Defense. We're undertaking now our third era of nuclear modernization. The first two were conducted in 1960, and 1980, mainly in a situation of competition with the Soviet Union. However, now we face two heavily nuclear armed near peer competitors, Russia and China.

More than ever, we're relying on modernizing our triad to perform the deterrence mission, the deterrence mission which is the bedrock of our National Security Strategy. This year, we were informed that there is a Nunn-McCurdy breach of the Sentinel ICBM [intercontinental ballistic missile] replacement program.

General Bussiere, I will want to know how your command is investigating this issue. Administrator Hruby, pit production cost continues to climb at the Savannah River Plant and I look forward to your telling us how you're tracking and working on containing them. Mr. White, you perhaps have the toughest job of all managing the largest liability of the Federal Government which in 2023 was estimated at \$531 billion.

I want to know what you are doing to work your way through this backlog of cleanup and whether there are less costly methods to dispose of some of the tank waste at Hanford while still meeting our commitments to the State and to the environment.

Because we have two panels, I would appreciate if you could make short 2- to 3-minute opening statements. We'll have 5-minute rounds of questions. Again, welcome to the Committee, and thank you for your service.

Senator Fischer.

STATEMENT OF SENATOR DEB FISCHER

Senator FISCHER. Thank you, Mr. Chairman, and thank you to all of our witnesses for being here today.

Our nuclear deterrent underpins our entire National Security Strategy and it must remain safe, reliable, effective, and credible. We face two peer nuclear adversaries for the first time in history. While our current nuclear weapons and delivery systems meet the threats of today, I'm increasingly concerned that our planned force posture for the 2030's and beyond will be insufficient. We need to start laying the groundwork today to set the conditions for success in the future.

I look forward to hearing from the witnesses on both panels on the progress being made with current programs of record and what additional resources or authorities are needed to accelerate that progress.

I would also like to note that last year's report from the Bipartisan Strategic Posture Commission included 81 recommendations that I believe laid out an excellent framework for this Nation to revitalize our entire nuclear enterprise. Senator King and I worked together on a bill, the Restoring American Deterrence Act that encapsulates many of these recommendations.

I look forward to working with all of our panelists over the coming months as we seek to implement some of those changes.

Thank you again for joining us today, and thank you, Mr. Chairman.

Senator KING. Administrator Hruby.

STATEMENT OF MS. JILL M. HRUBY, ADMINISTRATOR OF THE NATION NUCLEAR SECURITY ADMINISTRATION

Administrator HRUBY. Well, thank you. Chairman King, Ranking Member Fischer, it's a pleasure to be here to present the President's Fiscal Year 2025 Budget Request for the Department of Energy's National Nuclear Security Administration [NNSA].

In today's complex and dynamic security environment, NNSA is delivering. Last year we provided the Department of Defense over 200 modernized weapons on schedule. Our nuclear non-proliferation and counter-terrorism programs are advancing technologies

and partnerships that are responsive to today's global environment. We are preparing for the future by revitalizing our infrastructure and staying at the cutting edge in select science and technology.

NNSA's fiscal year 2025 budget request of \$25 billion reflects these priorities. The nuclear weapons program of record has grown from five to seven systems to be delivered or in active production within the next decade. This request supports all those systems with the exception of SLCM-N [Sea-Launched Cruise Missile-Nuclear] just due to the timing of the 2025 budget request and the Fiscal Year 2024 NDAA.

However, NNSA is fully committed to fulfilling the SLCM-N requirement. These seven systems represent modernized weapons for all three legs of the Triad and the new capabilities responsive to today's security environment. Additionally, the request supports two phase one studies to prepare to meet future deterrent needs.

To deliver this demanding schedule, NNSA is prioritizing infrastructure investments to get needed capabilities completed on time while also pursuing a longer-term strategy of a responsive, flexible, and resilient enterprise. High priority projects include the pit production facilities at Los Alamos and Savannah River. The uranium and lithium processing facilities at Y-12. Our defense nuclear non-proliferation activities are also responding to today's global dynamic and anticipating the future.

In summary, NNSA's is holistically supporting nuclear deterrence and strengthening relationships with our allies and partners. There's a lot of work ahead and we appreciate your support. Thank you.

I look forward to your questions.

Chairman KING. Thank you, Administrator Hruby.
Admiral Houston.

STATEMENT OF ADMIRAL WILLIAM J. HOUSTON, USN, DEPUTY ADMINISTRATOR FOR THE OFFICE OF NAVAL REACTORS, NATIONAL NUCLEAR SECURITY ADMINISTRATION

Admiral HOUSTON. Chairman King, Ranking Member Fischer, distinguished Members of the Subcommittee, thank you for the opportunity to testify today. Your support for the Naval Reactors enables my team to design, operate, and maintain a globally deployed force of submarines and aircraft carriers that reliably and consistently carry out our national security missions around the world.

Today, the U.S. Navy's nuclear power warships are operating alongside our allies and partners in hostile regions, providing forward presence, and safeguarding stability in a world that is increasingly tense. Our global presence continues to be supported by strong allies and relationships through the AUKUS [Australia, United Kingdom, United States] agreement.

The United States, United Kingdom, and Australia have demonstrated a trilateral commitment to free and open Indo-Pacific region while expanding the region of effectiveness of all three nations' military forces. Naval Reactors has delivered the advanced technology that provides our fleet competitive edge in the maritime environment through investment in research and development in the past decades.

Our talented people, our peerless technology, and our state-of-the-art facilities give us the ability to operate submarines and carriers wherever and whenever we choose. We must step up this investment if we want to sustain and exploit that advantage. My budget request for fiscal year 2025 is \$2.12 billion and invest in each of the following three areas, and two priority projects.

First, my request supports our most important resource, our people. The talented and dedicated people within the Naval Nuclear Propulsion Enterprise are essential to the management and oversight of the important work we perform for our Nation. Second, the budget reflects continued investment in R&D [research and development] of technology to support our current and future fleet, to substantially lower costs, reduce construction timelines, and add fleet capability. Finally, my request focus on investment to modernize the critical infrastructure throughout our 70-plus-year Department of Energy Laboratories and address our legacy environmental liabilities.

I'm also seeking your continued support for two national priority projects. The first continued development of the reactor plan for the *Columbia*-class ballistic missile submarine directly supporting the Navy's number one acquisition priority. The second project is continued construction of the naval spent fuel handling facility in Idaho which enables long-term reliable processing and packaging of spent fuel from the Navy's nuclear fleet.

In closing, your strong and enduring support enables Naval Reactors to provide the Nation and nuclear power fleet that is unrivaled. I respectfully urge your endorsement of our fiscal year 2025 budget request. Thank you.

[The prepared statement of Admiral William Houston follows:]

PREPARED STATEMENT BY ADMIRAL WILLIAM HOUSTON

Chairman King, Ranking Member Fischer, and distinguished Members of the Subcommittee, thank you for the opportunity to appear before you today and present the President's Fiscal Year 2025 Budget for Naval Reactors. Your continued, strong support for the unique mission and successful execution of the Naval Nuclear Propulsion Program enables our nuclear Navy to carry out vital missions around the world, at any time, in response to global events.

In my first year of an 8-year tenure as Director of Naval Reactors, the program continues to celebrate the 75th anniversary of delivering naval nuclear propulsion for the Nation and powering maritime dominance. I have spent the first several months meeting our experts and touring the laboratories, nuclear capable shipyards, and facilities that ensure safe and effective operation of the Program's cradle to grave responsibilities. I look forward to continuing improve upon the solid foundation that Admiral Rickover and my predecessors have built and maintained.

With identification of the formal requirement for a nuclear powered submarine in 1948, the Nation embarked on a path that continues today. We train nuclear operators, rely on and shepherd the nuclear industrial base, and employ nuclear shipyards with the same rigor and passion as those early days. The Program began with no certainty of success, but under the leadership of Admiral Rickover and with tremendous congressional support, we, alongside our most capable allies, remain the dominant force in naval nuclear propulsion. Today, Naval Reactors is engaged in a tireless pursuit of new technologies, new materials, innovative designs and adaptive approaches toward keeping our nuclear-powered submarines and aircraft carriers at sea longer, with enhanced warfighting capabilities. Our potential adversaries are also dedicated in their pursuits. Your partnership and leadership together with the Department of Energy and the Navy is needed now, more than ever, as we work on naval nuclear propulsion that will power our fleet and protect the national security of the United States throughout the remainder of this century.

Today's strategic environment is rapidly changing and complex. The global balance of military capabilities is evolving, but the Naval Nuclear Propulsion Program is in place and answering the challenge. Our actions today will impact the security and prosperity of our Nation for generations. As I enter my tenure at Naval Reactors, I will ensure that we sustain and improve our principal naval warfighting advantage and maintain our supremacy in the maritime battlespace. That supremacy cannot be taken for granted and it is not the sole purview of the United States.

Consistent with the National Security Strategy and the National Defense Strategy, it is vital for the Navy to maintain and expand our competitive advantage by aggressively investing in emerging technologies. The principal strategic issues driving the need for urgent technological advancements are embedded in the growing security threat from China and Russia. China continues to advance and establish an expanding naval presence, projecting power and challenging United States maritime superiority in new arenas. Meanwhile, Russia poses an immediate threat to free and open international systems and sovereign rights, relying on coercive practices to pursue an edge over the United States and our allies. To properly defend against these threats, nuclear-powered submarines and aircraft carriers with greater capability, firepower, and endurance will be required. Technology for the next generation of nuclear propulsion must be developed today in order to be ready to deliver the increased speed, improved stealth, and enhanced warfighting capabilities needed to retain our advantage. From concept to production, our focus on technologies and processes that can reduce the build span times and costs of these platforms is essential to delivering more ships, faster. In addition to our own efforts, leveraging the technical expertise and resources of our allies and partners remains a key advantage and greatly complicates our adversaries planning.

For the last several years, diplomatic, and congressional leaders have been developing, coordinating, and planning to execute the Australia, United Kingdom, and the United States (AUKUS) tri-lateral security partnership. The AUKUS partnership bolsters our own shipbuilding capability through uplift of our industrial and vendor base capacity, and builds upon over a half century of collaboration with the United Kingdom on naval nuclear propulsion. Operational, rotational deployments of US Navy submarines through the Submarine Rotational Force—West and ultimately the operation of Australian conventionally armed, nuclear-powered submarines throughout the Indo-Pacific region, are efforts supported fully through the United States Naval Nuclear Propulsion Program. Given the global threats we face, it is imperative that we work with our closest allies to improve their capabilities and expand their reach in the undersea domain. Development and planning for AUKUS is resulting in tangible outputs this year, enabled by necessary investments from our foreign partners, but supported by Naval Reactors' core mission and activities funded in our DOE budget. We remain concentrated on providing nuclear propulsion to retain the US Navy's maritime dominance, while also leveraging our 75 years of preeminence in naval nuclear propulsion to support U.S. commitments under AUKUS. Our continued success rests on the foundation of prior efforts but is only sustained in what we build and prioritize today.

NAVAL REACTORS OVERVIEW

Naval Reactors' budget request for fiscal year 2025 is \$2.12 billion, an 8.9 percent increase over the fiscal year 2024 enacted level.¹ Your support has also facilitated the continued safe operation of the nuclear fleet, along with the unmatched protection of the Sailors operating our ships, the workers maintaining our ships, and the public and environment through our continued, focused, regulatory oversight of the Naval Nuclear Propulsion Program, documented in our annual performance reports available via the Department of Energy webpage. Previous congressional support has allowed significant progress on three major Department of Energy funded projects—*Columbia*-class propulsion plant development and production, construction of the Naval Spent Fuel Handling Facility in Idaho, and completion of the refueling overhaul of our research and training reactor in New York. In the coming years, Naval Reactors will complete these projects and I look forward to keeping the committee updated as we move through each. For example, we have made substantial progress with *Columbia*-class propulsion plants in support of the lead ship construction and are entering serial production of the life-of-ship cores. The Program also continues to make progress amid challenges during construction of the incredibly important Naval Spent Fuel Handling Facility, and I will provide a full update later

¹Fiscal year 2024 Enacted amounts throughout this testimony do not reflect the mandated transfer of \$92.8 million from Naval Reactors to the Office of Nuclear Energy for operation of the Advanced Test Reactor.

in my statement. Finally, the refueling overhaul of our research and training reactor will complete later this year, and nuclear operator training will resume in New York early next year.

While we are staying focused on completing these near term efforts, we also continue to invest and plan for the long-term future of naval nuclear propulsion. Naval Reactors remains engaged under DOE and NNSA's leadership to ensure a future uranium enrichment capability to 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. Notably, at the Naval Reactors Facility in Idaho, the Expended Core Facility continues to provide our Program the capability to manage spent nuclear fuel, and perform core and post-irradiation examinations. However, this facility is over 60 years old and Naval Reactors is executing a plan to exit the facility by transitioning capabilities out in stages, the first being spent fuel management, which will transition to the Naval Spent Fuel Handling Facility in the late 2020's. This budget request initiates the next stage in that exit strategy by requesting funding to begin the second infrastructure project that will transition core examinations out of the Expended Core Facility. Even further out, a future irradiation testing capability will be vital to the Naval Reactors program. DOE, NNSA and NR are working on a long-range plan for such a capability beyond 2040.

MAJOR PROJECTS

Columbia-class Propulsion Plant

The *Columbia*-class ballistic missile submarine remains the Navy's number one acquisition priority. Naval Reactors is delivering the life-of-ship reactor core and the electric drive propulsion system for the *Columbia*-class. To date, lead ship reactor plant components have been delivered on time and the reactor core is on track to support lead ship delivery. The fiscal year 2025 budget includes \$45.6 million to continue reactor plant design, fabrication, and safety analysis work required for lead ship reactor testing. Additionally, Naval Reactors will soon commence lead ship motor module testing of the electric drive propulsion system at the compatibility test facility in Philadelphia, PA.

Spent Fuel Handling Recapitalization Project

Naval Reactors is continuing construction of the Naval Spent Fuel Handling Facility at the Naval Reactors Facility in Idaho. The Naval Spent Fuel Handling Facility is essential to our mission to manage naval spent nuclear fuel in support of aircraft carrier and submarine fleet requirements. The fiscal year 2025 budget request includes \$292 million for continuation of this project through near-term milestones including erection of structural steel for the main process building, construction of the reinforced concrete spent fuel pools, and installation of utility systems. During the last several years, the project has encountered a number of challenges. Specifically, the COVID-19 pandemic introduced work delays and additional costs for the Project's active and planned construction subcontracts due to volatile market conditions. Most recently, we worked through subcontractor performance issues and the effects of limited competition for construction subcontracts in Idaho resulting in a revised acquisition plan for a major construction subcontract and additional funding requirements. Funding in fiscal year 2025 will be vital to continuing the construction sequence and achieving the Project's milestones. 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 fiscal year 2025 budget request represents the first year of Major Construction Project construction funding to begin the detailed design phase for the Naval Examination Acquisition Project, which will recapitalize and transition the core examinations capability out of the Expended Core Facility. Core examinations are critical to current fleet operations as they allow scientists and engineers to compare actual, measured core performance data to expected performance predicted by models and various testing programs during design and manufacture. More specifically, these examinations provide feedback to validate and deliver safe and unrestricted fleet operations throughout the decades-long lifespans for which we have designed the cores. Without these examinations, current fleet operations may be conservatively restricted or reduced when issues arise so that sufficient conservatism is maintained to protect the crew, the core and the environment. In addition to directly informing current fleet operations, core examinations provide critical feedback for future designs to improve performance, manufacturability, and efficiency of our

cores. Funding in fiscal year 2025 enables the Program to begin the several-year detailed design phase to prepare for construction. We are incorporating lessons learned from the Spent Fuel Handling Recapitalization Project and are engaged with the NNSA and DOE on the outlook of infrastructure, especially in Idaho, to ensure the project is best positioned for success. I look forward to providing an update as we come through the design phase of the project.

TECHNICAL BASE FUNDING

In addition to our three priority projects, Naval Reactors maintains a world-class, high-performing workforce across the technical base providing 24/7 year-round support of the cradle-to-grave operations of our naval nuclear enterprise. The technical base is the set of fundamental skills and capabilities necessary to safely and effectively support the nuclear Navy. It includes a foundation of specialists in nuclear materials, nuclear physics, thermal-hydraulics testing, acoustics, electronics, software development, systems integration, and other specialized skills, along with the associated facilities and laboratories to conduct our work.

The people and activities that make up our technical base perform essential work to support the operating fleet and set the foundations for our Navy to retain its technological advantages over our competitors. Specifically, the technical base: 1) addresses emergent, daily needs and challenges of our globally deployed nuclear fleet, 2) executes cutting edge technology research and development that supports improving today's nuclear fleet and assessing future naval nuclear propulsion capabilities, and 3) modernizes critical infrastructure and equipment while reducing the Program's legacy environmental liabilities.

Attracting 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. We remain focused on recruiting and retaining a well-trained, highly qualified workforce and continue to work with the leadership of our laboratories, private shipyards, Navy, and DOE to stay competitive in this aggressive talent market.

Program Direction

Our lean and highly skilled Federal workforce is critical to the execution of our responsibilities. With the fiscal year 2025 Program Direction request of \$62.8 million, we remain dedicated to attracting, developing, and retaining a talented and diverse workforce to oversee and manage work across the Naval Nuclear Propulsion Program. The talented and dedicated people at our Washington, DC headquarters and field offices around the world report directly to me and are essential to our strong, centralized management model and oversight of the important work we perform every single day.

Supporting the life-cycles of several classes of nuclear-powered ships whose lifetimes can extend over half a century requires staffing continuity and longevity to ensure the Nation has a workforce with the deep technical knowledge to execute Naval Reactors' cradle-to-grave responsibilities. I must have sufficient Federal staffing to meet the demands of sustaining and improving today's fleet while simultaneously growing our future capabilities. Diverse, complex systems, new and innovative research efforts, and growing cyber and other vulnerabilities require maintaining and then developing additional workforce expertise within our human capital strategy. Recruiting, rewarding, and retaining our workforce at our full personnel requirements is the fundamental enabler of all aspects of naval nuclear propulsion.

The market demand for our highly skilled and experienced workforce introduces challenges to recruit and retain a top-tier workforce that values its contribution to national defense. In concert with our ongoing focus on research and development, we are implementing new ways to bring in and retain the Nation's top talent at Naval Reactors and give them resources to introduce technical innovations into our submarines and aircraft carriers. I respectfully request Congress' support of the fiscal year 2025 Program Direction budget request, which will allow me to recruit, select, develop, and retain a highly skilled workforce to support mission requirements.

Research and Development

Our research and development strategy remains focused on strengthening a vulnerable competitive advantage over strategic adversaries like China and Russia. Technology investment must be prioritized and sustained today to develop new technologies that deliver increased capability, and reduce costs, lead times and construction spans for both the current and future nuclear powered fleet. Throughout the United States, important research and development is conducted by the dedicated and talented teams of people at our Naval Nuclear Laboratory sites—the Bettis

Atomic Power Laboratory in Pittsburgh, the Knolls Atomic Power Laboratory and Kesselring Site in greater Albany, and the Naval Reactors Facility in Idaho.

Our first priority is to support today's fleet of nuclear powered forces. Our labs perform thousands of technical evaluations annually that enable Naval Reactors to assess and respond to emergent issues, keep our ships mission-ready, safe to operate, and deployable anywhere, any time.

Several years ago Naval Reactors began an effort to reinvigorate investment in advanced technology development for the next generation of nuclear powered ships and submarines. Today, we are pursuing advanced reactor core and fuel systems, advanced manufacturing and inspection techniques, next-generation propulsion plant equipment, including instrumentation and control systems and sensors and asymmetrical applications of emerging technologies. These advancements take time to materialize but today's strategic environment requires a renewed sense of urgency in leveraging exploratory methods to shorten development timelines, lower acquisition and lifecycle costs and improve adaptability. I invite you to visit our facilities with your staffs, talk with our onsite experts and enhance your understanding of how we are delivering nuclear propulsion capability.

I want to assure the committee that our investments are supported by a comprehensive and rigorous planning effort we undertake with our partners at the Naval Nuclear Laboratory. This year's budget request has been meticulously developed and prioritized to meet our required investment needs to stay ahead of our adversaries.

Facilities and Infrastructure

Our Naval Nuclear Laboratory facilities and infrastructure are essential in carrying out Naval Reactors' mission. This year's budget request supports recapitalization of Naval Nuclear Laboratory facilities and infrastructure systems, many of which have supported the Program since its inception, 75 years ago.

Decontaminating and decommissioning (D&D) older facilities that have been in existence since the early 1950's is also part of our facilities and infrastructure request. We have approximately \$6.4 billion in environmental liabilities requiring D&D efforts. A significant portion of this estimate is associated with the cost to remediate and demolish inactive facilities and infrastructure at the Naval Nuclear Laboratory sites.

We continue to retire liabilities in an environmentally responsible and cost-effective manner to support best use of our funding. Through our established partnership with the Department of Energy Office of Environmental Management (DOE-EM), we are leveraging their experience in efficient, safe, and cost-effective remediation of environmental liabilities across the enterprise. DOE-EM is active on all four of our sites with impressive efforts taking place, such as the D&D of our legacy prototypes at the Naval Reactors Facility, including the S1W prototype that supported development of the USS Nautilus (SSN 571), which will complete dismantlement in fiscal year 2025.

AUKUS

In September 2021, President Biden announced an enhanced trilateral security partnership between Australia, the United Kingdom, and the United States (AUKUS). Concrete steps are underway to support Australia acquiring conventionally armed nuclear-powered submarines (SSNs) and Naval Reactors remains integral in informing discussions to ensure that our Nation's preeminent expertise is applied to the nuclear-powered submarine initiative.

Efforts are focused on ensuring Australia acquires full scope of capabilities necessary to build, operate, and maintain a nuclear navy. Additionally, we are concurrently executing the process of providing a generational uplift in technology to the United Kingdom in support of delivering SSN-AUKUS. We will increasingly utilize the trilateral partners' existing and evolving regulatory frameworks, educational, industrial, and technical capabilities and capacities to collectively strengthen each nation's defense. Naval Reactors is fully committed to supporting Australia in the development of its stewardship and technical capabilities. Going forward, all three of our naval nuclear propulsion programs will be inextricably linked, and remain committed to ensuring the highest standards of stewardship for this complex and unforgiving technology.

AUKUS is a significant addition to Naval Reactors' existing mission, with activities funded through reimbursable agreements with Australia and the U.K. I am committed to work productively with our partner nations, the Administration and Congress to ensure the necessary and enduring investment is made for this critical endeavor to succeed. Naval Reactors must continue to deliver its primary mission

to the United States Navy without compromise, as it is foundational to being able to support the AUKUS objectives

CONCLUSION

The United States Navy's ability to maintain our 75-year dominance of the maritime domain and sustain a formidable forward presence is not guaranteed; every day we are being actively challenged on a global scale. Naval nuclear propulsion is an incredible but unforgiving technology, and must be harnessed with a constant focus on safe operation across the cradle-to-grave responsibilities the Nation entrusts to Naval Reactors. The Program is dedicated to balancing investments in today's fleet with future fleet requirements, while delivering effective naval nuclear propulsion for the U.S. Navy. I appreciate the strong support of Congress for this program and respectfully urge your full support for our fiscal year 2025 budget request.

Senator KING. Thank you, Admiral.

Mr. White, you must have one of the toughest jobs in Federal Government. Give us an update.

STATEMENT OF MR. WILLIAM WHITE, SENIOR ADVISOR FOR ENVIRONMENTAL MANAGEMENT, DEPARTMENT OF ENERGY

Mr. WHITE. Thank you, Senator.

Chairman King, Ranking Member Fischer. It's an honor to appear before you. The EM [Environmental Management] mission reflects the United States' commitment to cleaning up the environmental legacy of national defense programs that helped in World War II and the cold war. While our mission is rooted in the past, we're very much focused on the future.

Cleanup progress at the Savannah Riverside in South Carolina, for example, is leading to a greater role for NNSA there. Cleanup accomplishments are boosting the clean energy economy in Tennessee and helping the Oak Ridge National Laboratory and the Y-12 National Security complex prepare for expanding national security and research missions.

As buildings like the Biology Complex have come down, national security and science missions have the space to be built up. The budget request positions EM to deliver on these and other priorities that drive risk reduction, progress skyline changes, and help us ramp up tank waste treatment which is the largest part of the environmental liability that you mentioned earlier.

In Washington, 800,000 gallons of tank waste have been treated at Hanford and will ultimately be stabilized in glass. The waste treatment plant melters have reached operational temperature and have been used to pour the first containers of test glass from both melters. The Test Bed Initiative is advancing as another potential option to accelerate the Hanford Tank Waste mission through commercial grouting and disposal.

In parallel, we've reached a breakthrough agreement with the State of Washington and the EPA [Environmental Protection Agency] that charts the safe and achievable path for the Hanford Tank Waste mission. The fiscal year 2025 request is consistent with this agreement which will enable us to begin addressing Hanford's high-level tank waste and achieve risk reduction while exploring alternative treatment technologies to accelerate our work on EM's largest environmental liability.

By turning this corner with our regulatory partners, we hope to aggressively move forward with our mission at Hanford, honoring

our responsibility to the environment and our commitment to the communities and the tribal nations around the site. Demolition efforts across EM are also moving forward.

After bringing down four buildings at the Nevada National Security site last year, we'll continue reducing our footprint as we work to complete the legacy cleanup there within a decade. Demolition work at West Valley in New York will advance as well as cleanup of the highest risk excess facilities in Tennessee.

This request also enables continued shipments to the Waste Isolation Pilot Plant as we modernize the facility to meet the needs of both cleanup and national security programs. While significant progress has been made, we're always looking at opportunities to improve. The budget request allows for continued improvement to the rigor of program and project management as well as opportunities to progress cleanup safely and more efficiently.

This includes technology development, targeted R&D investments, evaluation of cost-effective treatment options, and investment in building future workforce pipelines. I thank the Subcommittee for its historical support of our program and our mission and I look forward to your questions.

[The prepared statement of Mr. William White follows:]

PREPARED STATEMENT BY WILLIAM "IKE" WHITE

Chairman King, Ranking Member Fischer, and Members of the Subcommittee, it is an honor to appear before you today to represent the Department of Energy's (DOE) Office of Environmental Management (EM).

EM's mission represents the government's strong commitment to cleaning up the environmental legacy of the national defense programs that helped end World War II and the cold war. EM's vital mission does not just address past legacy; it also helps support and enable DOE's ongoing national security and scientific research missions.

The fiscal year 2025 budget request of \$8.2 billion for EM reflects the Biden Administration's strong commitment to advancing the cleanup mission and preparing for sustained success, maintaining national security priorities, and supporting communities most impacted by the environmental legacy of the past.

35 YEARS OF PROGRESS

For nearly 35 years EM has been entrusted with the largest environmental cleanup effort in the world—addressing the substantial environmental liability from decades of nuclear weapons production and nuclear energy research. From an original 107 sites, some dating back to the Manhattan Project Era and the birth of the Atomic Age, EM has cleaned up 92 sites, leaving just 15 to go.

EM's significant accomplishments just in the past few years have included completing demolition of the Plutonium Finishing Plant, a facility that produced two-thirds of the Nation's cold war-era plutonium at the Hanford Site in Washington State; completing the removal of the former uranium enrichment complex at Oak Ridge in Tennessee; and completing construction of the entire tank waste treatment system at the Savannah River Site in South Carolina, enabling significant progress in how the Department tackles one of its largest environmental and financial liabilities at that site.

TRANSFORMATIONAL RESULTS

Enabled by the significant investments Congress has made in the program, EM has delivered accomplishments and capabilities that have transformed the environmental cleanup mission. Game-changing tank waste treatment capabilities are in place to address EM's largest environmental liability. With startup of the Salt Waste Processing Facility, a full suite of tank waste treatment capabilities is in place at the Savannah River Site. Since 2020, EM has more than doubled tank waste treatment capability at the Site. The Integrated Waste Treatment Unit has treated over 68,000 gallons of tank waste in Idaho since the start of operations in 2023. EM has also treated over 800,000 gallons of radioactive and chemical waste

from large underground tanks at the Hanford Site where work is progressing toward initiation of the Direct Feed Low Activity Waste (DFLAW) project that will convert this waste into glass for disposal. Both Waste Treatment Plant melters have been heated to operational temperature and the first containers of Activity Waste (DFLAW) project that will convert this waste into glass for disposal. Both Waste Treatment Plant melters have been heated to operational temperature and the first containers of

EM progress extends well beyond the tank waste mission. Demolition efforts across the EM enterprise have resulted in risk reduction and have opened up opportunities for conservation, economic development, scientific research, and national security priorities. Removing an entire enrichment complex at the Oak Ridge Site has led to a significant increase in ongoing demolition work at the Oak Ridge National Laboratory and Y-12 that is freeing up future mission capabilities for the National Nuclear Security Administration (NNSA) and the Office of Science. The Nevada National Security Sites has completed demolition of four buildings that supported development and testing of nuclear rocket engines during the cold war Era. This year, EM plans to complete demolition of Building 3901 and four ancillary structures at the Engine, Maintenance, Assembly, and Disassembly Facility and will continue to reduce the overall cleanup footprint in Nevada in Fiscal Year 2025. In addition, work at the West Valley Demonstration Project's Main Plant Process Building has progressed with more than 9,000 tons of debris from the demolition disposed in 2023. This priority will continue this year and will further advance under the Fiscal Year 2025 budget request.

Shipments and waste emplacement doubled at WIPP in Fiscal Year 2023. This includes shipments from the Los Alamos National Laboratory, where the EM team certified and completed 59 shipments to WIPP, surpassing the Fiscal Year 2023 goal of 40 shipments.

STEADY PROGRESS PLANNED FOR FISCAL YEAR 2025

The Fiscal Year 2025 budget request reflects the Administration's strong commitment to cleaning up the environment in communities that supported or continue to support weapons programs and government-sponsored nuclear research. Key investments position EM for sustained achievement as the program continues to drive risk reduction, progress skyline changes, and ramp up efforts to tackle tank waste while enabling DOE's vital national security and scientific research missions.

Protecting the environment by addressing radioactive waste stored in underground tanks at Hanford, Savannah River, and the Idaho National Laboratory is a top priority for EM. The budget request advances commissioning and startup of Hanford's Direct Feed Low Activity Waste system. After decades of support from the local community, Congress, and the workforce, this transformational accomplishment is within sight.

As we prepare to begin operating Hanford's low-activity tank waste vitrification capabilities, the budget request also invests in work on the Waste Treatment Plant's High Level Waste facility to be able to tackle that portion of Hanford's tank waste inventory. In parallel, EM continues to identify safe, effective, and viable options for the treatment of all Hanford's tank waste.

EM is focused on moving the entire Hanford tank waste mission forward, recognizing that additional delays bring greater environmental risks, exacerbate the impacts of already aging infrastructure, and increase costs. DOE, the Washington State Department of Ecology, and the U.S. Environmental Protection Agency recently announced a landmark agreement that proposes a realistic and achievable holistic path for advancing the Hanford tank waste mission. The fiscal year 2025 budget request is consistent with the agreement which will enable EM to progress Hanford's high level tank waste mission via a direct-feed approach and achieve risk reduction while continuing to explore alternative treatment technologies for low-activity waste, including grout. Through the agreement and pursuit of an EPA variance, DOE will have a stronger path forward for out-of-State grout disposal through at least 2040. Enabling a path to offsite grout is responsive to recommendations from the National Academies of Science, the General Accountability Office, Congress, and others. EM has also developed a Research and Development Roadmap to guide investments in additional technology options to accelerate the Hanford tank waste mission. This year, EM is planning to initiate installation of equipment for the Test Bed Initiative Demonstration project, which has the potential to safely pretreat low-activity waste from Hanford tanks, solidify the waste, and dispose of it off-site in a manner that is protective of the workers, the public, and the environment.

In addition to helping solve the challenges of tank waste, the request will enable EM to continue meaningful cleanup progress across the Hanford Site, including

transferring radioactive capsules to safer dry storage, advancing work in and around the 324 Building, and treating another 2 billion gallons of contaminated groundwater.

In South Carolina, the Fiscal Year 2025 budget request supports continued efforts to fully utilize Savannah River Site capabilities to continue waste processing and tank closure activities. The budget request also supports continued progress in disposition of nuclear materials stored at the Savannah River Site, storage and disposition of site-generated waste, cleanup of contaminated soils, groundwater, streams and associated wetlands, and the deactivation and decommissioning of legacy facilities.

At the Idaho National Laboratory, the request supports continued operations of the Integrated Waste Treatment Unit which will ultimately treat about 900,000 gallons of liquid waste by turning it into a granular solid. The request also supports progress toward key cleanup priorities, including continued treatment and shipping of transuranic waste to the Waste Isolation Pilot Plant, decontamination and demolition of facilities at the Subsurface Disposal Area (SDA), initiation of construction of an engineered cap over the SDA, and further evaluation of the treatment options for calcine waste.

SUPPORT FOR NATIONAL SECURITY MISSIONS

In addition to reducing environmental risks at these and other sites across the complex, EM progress is supporting national security priorities, enabling scientific research, establishing opportunities for conservation and clean energy development, and boosting community efforts to build strong economies and create jobs.

In recognition of the role the Savannah River Site will play in the National Nuclear Security Administration's pit production mission, EM will transfer site management responsibilities to NNSA in fiscal year 2025, while remaining focused on completing the remaining legacy cleanup activities at the site. EM and NNSA are committed to a successful transition that keeps national security priorities, as well as the long-term outlook for the site and community at the forefront.

Perhaps nowhere are the opportunities to support national security and research priorities more evident than in Tennessee where large-scale cleanup operations are firmly underway at the Oak Ridge National Laboratory (ORNL) and the Y-12 National Security Complex. Building on previous demolition work, EM transferred the 18-acre Biology Complex at the Y-12 National Security Complex to the NNSA, which is using it to build a new Lithium Processing Facility. In 2023, EM tore down the Low Intensity Test Reactor located in ORNL's central campus, marking the second reactor demolition within the span of a year. Oak Ridge is continuing deactivation at numerous high-risk facilities, including multiple former enrichment facilities at Y-12 and former reactors and isotope labs at ORNL. This year, EM will initiate demolition of the Alpha 2 Building at the Y-12 National Security Complex. Once completed, this will mark the first demolition of a former enrichment facility at Y-12. This steady progress is a part of a broader vision focused not only on cleaning up the past, but also advancing the ORNL and Y-12 research and national security missions.

The budget request supports additional cleanup of high-risk excess facilities at the Oak Ridge National Laboratory and the Y-12 National Security Complex. It also supports work to advance the Mercury Treatment Facility and a second onsite waste disposal facility, both of which are pivotal to future efforts to reduce risks, stabilize facilities, advance cleanup, and ultimately provide land for research and national security missions.

While significant progress has been made in the deactivation and decommissioning of excess facilities, EM is continuously looking at opportunities to further improve. As strategies for the removal of these facilities are refined, EM is collaborating with NNSA and the Office of Science to plan, prioritize, and achieve optimal sequencing of work to best meet both environmental cleanup commitments, as well as other overarching DOE priorities.

EM is in the midst of a significant infrastructure and modernization campaign at WIPP, a facility that just marked its 25th anniversary as the lynchpin of EM's transuranic waste mission. The utility shaft that is critical for ventilation upgrades has reached its final depth and commissioning of the new Safety Significant Containment Ventilation System is underway. Along with providing for continued WIPP operations, as well as waste characterization and transportation programs, the budget request supports continued infrastructure recapitalization projects, as well as mine modernization activities and safety upgrades in Fiscal Year 2025. Taken together, these projects will help ensure EM has the infrastructure in place to support disposal operations for years to come.

INVESTING IN THE FUTURE

Recognizing the EM mission will span several decades at some sites, the budget request also supports efforts to foster, build, and maintain a next-generation workforce that promotes diversity, equity, inclusion, and accessibility.

Across the program, EM is ensuring resources are focused on the most urgent risks and taking an integrated and corporate approach to prioritizing all work at remaining sites. In addition, EM is constantly looking for new opportunities to drive down the overall lifecycle costs at these sites. Across mission areas, EM utilizes science-based advancements that provide opportunities to meet cleanup commitments safely and more efficiently. EM is leveraging the expertise of the Savannah River National Laboratory and the Network of National Laboratories for Environmental Management and Stewardship to develop innovative solutions that will benefit EM, the NNSA, and other DOE missions. The budget request supports a more integrated approach to EM technology development, targeted R&D investments, the continued evaluation of additional treatment and disposal options, and partnerships with regulators to apply effective solutions. The budget request also supports ongoing efforts to actively engage with local communities, consult with Tribal Nations, and prioritize stakeholder engagement to ensure inclusive and transparent communication. These efforts are helping to achieve a greater degree of alignment to enable continued progress.

As the world's largest environmental remediation program, EM also has a responsibility to accomplish the mission in a way that is sustainable and that supports the future of our planet. EM aims to lead by example in areas like clean energy utilization and climate resiliency.

Whether it is boosting sustainability, building a workforce for tomorrow, investing in R&D, analyzing disposal options, reaching decisions about remaining waste streams, achieving regulatory alignment, or upgrading infrastructure, EM is preparing for the future. These multi-faceted activities are laid out in EM's annual priorities list and 10-year strategic vision as part of EM's ongoing efforts to improve prioritization, planning, and mission execution.

CONCLUSION

The fiscal year 2025 budget request is the latest sign of this Administration's strong support for EM's vital mission. As the mission is carried out, EM is committed to continuous improvement and making further advancements to ensure that cleanup activities are conducted in a safe, efficient, and cost-effective manner.

Senator KING. Thank you.

You'll notice the vice chair and I are the only ones here, and I want to explain that. We are hoping that someone with an AI [artificial intelligence] capacity will figure out how to schedule the Senate. It's not uncommon for us to have three hearings scheduled at the same time, and I think that's happened this afternoon. On top of that is a vote on the Senate floor. But be assured we all know these people and they're keenly interested in what you're doing.

Administrator Hruby, is Savannah River a practical project? Is it going to be able to be brought in at a reasonable time at a reasonable cost? The numbers keep going up and the date keeps moving out. Give me an update on Savannah River.

Administrator HRUBY. Yes, thank you, Senator King. I'd be happy to. In short, I would just say absolutely. It's a practical project and real progress is being made. We've done a lot of things to make this project more realizable. But the costs have gone up. I have much more confidence in the cost.

I think we all have much more confidence in the cost and the time estimate to complete the SAR goal now is to complete construction of Savannah River in 2032. Then to start the process to do rate production and have that complete in 2030, 2035, or 2036.

Senator KING. Is Los Alamos going to be able to meet the demand that we have for pits in the meantime?

Administrator HRUBY. They are. So, Los Alamos will be producing 30 pits per year in 2028 for the W-87—

Senator KING. One's been already produced this year. Is that correct?

Administrator HRUBY. We've made pits at Los Alamos. We're going to make our first fully WR, certified War Reserve certified diamond stamped, as we call it, pit, this year. But we made 9 complete pits last year plus five developmental pits last year at Los Alamos.

So, we're feeling a lot more confidence in our ability to make pits there repeatedly. We'll get our certification, we'll be on our path. We have a very detailed schedule path for 30 pits per year at Los Alamos.

Senator KING. Let me change the subject. One of your areas that you mentioned is non-proliferation. One of my biggest concerns is nuclear material falling into the hands of terrorists. In an open setting, what can you tell us about what steps are underway in order to prevent that from happening?

We have nuclear states, some of which are rather unstable. We have a nuclear State that seems inclined to sell things. That's the nightmare because we've all talked about deterrence. Deterrence doesn't work with a terrorist.

Administrator HRUBY. Yes.

Senator KING. They don't have a capital city that is at risk and they don't care about dying. So, we're going to have to rely on non-proliferation and intelligence. But what can you tell us in an open setting about dealing with that issue?

Administrator HRUBY. Well, we work with everybody that we can to get rid of weapon usable material or materials that would make dirty bombs. Terrorists are usually not in that group. So, what we do is we work with our allies and partners to make sure we have very strong border protection and crossing.

So, any illicit movement of materials and we have fortunately or depends on how you think about it but in this case, fortunately we have allies that live in bad neighborhoods around these places where terrorist cells exist and we have strong collaborations with them to make sure we can detect—

Senator KING. Do we have technology that can detect the movement of nuclear material?

Administrator HRUBY. Somewhat—

Senator KING. We're in an open setting, but in so far as you can answer that question.

Administrator HRUBY. Yes, somewhat. It depends on the amount and it depends on whether or not they shield it. There's lots of details that matter but we certainly work on those technologies and we deploy them, you know, frequently when we think they'll be effective and where we think they'll be effective.

Senator KING. I'm going to start with you, Admiral, but we'll come back in a second round. I worry about the submarine industrial base. We're barely building a submarine a year and if you add AUKUS, I just don't know who's going to build those submarines. Is that a concern of yours? What do we do to address it?

Admiral HOUSTON. Chairman, obviously construction of submarines, carrier submarine or it's near and dear to my heart. With

the *Columbia*-and the *Virginia*-class, the “1 + 2”, we have invested heavily as a Navy in the submarine industrial base to build that cadence, and really helping those sub-tier suppliers that actually feed our prime shipyards to build those submarines is really key.

We are fully committed to that, and your investment on the Navy is significant—

Senator KING. Do your current 5-year plan indicate that we’re going to have the capacity to build the submarines that we that we hope to?

Admiral HOUSTON. For my naval reactors hat on my DOE [Department of Energy] side, absolutely, and for the Navy side right now, we are progressing on a plan to get to 2.0 by 2028 and 2.33 by 2032, which corresponds to the time that we would be delivering the first submarine purchase by Australia.

Senator KING. That’s going to take some serious workforce development.

Admiral HOUSTON. It’s significant work. If you look at what we have done in 2014, we’re building a single *Virginia* and in 2024 we’re building two *Virginias* that are 25 percent bigger than the *Virginias* we’re building in 2014. We’ve added on top of that the *Columbia*-class which is two and a half times that original *Virginia*.

So, we have increased by fivefold the tonnage we’re building on submarines in the middle of COVID, in the middle of supply chain issues, and we are progressing on that. That is why the Navy is so invested in the submarine industrial base to improve that cadence on submarine construction which is absolutely critical to the roles submarines play for our strategic deterrence and also in the Western Pacific.

Senator KING. Thank you, Admiral.

Senator Fischer.

Senator FISCHER. Thank you, Mr. Chairman.

As Members of this Subcommittee are acutely aware, NNSA has extensive infrastructure needs. Some of your facilities date back to the Manhattan Project and budget constraints and uneven performance on past recapitalization efforts have increased the level of risk to the nuclear enterprise.

Administrator, can you provide this Committee with an update on the ongoing capital asset projects particularly the new facilities planned for the processing of the critical minerals?

Administrator HRUBY. Okay. Thank you, Senator Fischer.

We do have a lot of infrastructure projects underway. Our strategy is to finish, is to try—is to start getting them done and then start new ones as opposed to start them all at the same time, and so, we’ve been very stringent on our prioritization of these facilities and we’re doing this for reasons.

One, we need them. So, we need them to get our weapons done. The second thing is it’s cheaper if you can get them done than if you just continue to drag them out, we’ve seen cost increase as a result of that just by keeping people on roll that might not be at their full capacity. So, we have a plan to get projects finished. Now, with respect to critical minerals—

Senator FISCHER. Can I ask you what the priority is on the facilities? Which one you're prioritizing, some do similar minerals obviously, but most of them are doing different ones.

Administrator HRUBY. Right. So, our highest priority is pit production. So, the two facilities, one at Los Alamos and one at Savannah River. The other facility that we're pushing toward completion is the uranium processing facility at Y-12. The next most crucial facility from a single point of failure perspective is our lithium processing facility at Y-12.

In addition, we have high explosive facilities underway which are also critical to be able to produce the weapons that we have lined up.

Senator FISCHER. Did you want to finish your first comment when I interrupted?

Administrator HRUBY. Well, I just think that with three—I wanted to say more—newer to our discussions the fact that we broke ground on the lithium processing facility and this facility—

Senator FISCHER. Is that at Y-12?

Administrator HRUBY. That is at Y-12. It replaces a very old facility that has some serious both safety and structural issues, and so, we'll be talking about that in the years ahead. I think it's also to the point that Senator King made earlier, to get these pit production facilities done is going to require fast—it's going to require higher investments over shorter periods of time.

So, you're going to—you don't see that in the Fiscal Year 2025 request too much but I will—I think it's coming in your request.

Senator FISCHER. Thank you.

Administrator and Admiral, between the AUKUS agreement and the possibility that we're going to need to increase the number of planned hulls for *Columbia*-class, *Virginia*-class or SSNX submarines, how are we managing the increased demand for the highly enriched uranium for the Naval Reactors? Do we need to put plans forward for any new enrichment facilities?

Admiral HOUSTON. The highly enriched uranium supply is projected to last to the 2050's. Even with these increased demands, we are well aware of it. Naval Reactors is working very closely with NNSA and DOE because, as you know, we're currently getting our highly enriched uranium from older nuclear weapons that we're reprocessing.

So, it's something that has our attention. We have to develop a plan to do that, and we're watching that very closely. The increased demands from AUKUS, we've looked at that. It's very very small in the overall scheme. The bigger thing is that we have to get the capability in time to support about two to three metric ton delivery to support our fleet needs in the 2050's, and we're working very close.

Senator FISCHER. Okay. Thank you.

Thank you, Mr. Chair.

Senator KING. Admiral, I visit the Portsmouth shipyard fairly regularly and always climb down in a submarine that's under overhaul. By the way, I flunk the virtual welding test every time. I keep trying but it's very difficult. Anyway, are you doing any thought in your design to accelerating the overhaul process?

I'm concerned about availability of these very expensive assets and how much time they have to spend in dry dock. Are there, for example, Senator Fischer and I were in Maine, North Dakota and we went down into the missile field and the old missiles you've had to practically take them all apart to get to some of the pieces that needed maintenance.

Is this something that you think about in the design of the submarines in order to get them in and out of overhaul on a more accelerated timetable?

Admiral HOUSTON. Yes, Senator, that was my first time I met you, you're a Governor and we commissioned the Maine up in the Portsmouth shipyard. So, it's an incredible shipyard. It's one of our leading submarine shipyards there. It's a tremendous site, and I will tell you, we from the nuclear propulsion site are doing everything we can to expedite those.

We play a part in the submarine overhaul, a large, large portion of it. We are working with our INC to do a once in the life of the ship upgrade on that. We have a very robust design on that. We are looking at maintenance activities such as our media discharges to do a once in life, and we are pushing technology.

We have invested heavily in additive manufacturing because from a Naval Reactor standpoint, I own both the technical requirements and I also own the financial levers to pull. I'm actually leading the way for NAFC and I have components now that are being additively manufactured that are going into our primary plants, our reactor plants, to lead the way.

So, we are trying to accelerate that because I see the same thing. It's more than just ship building. It's that ship repair and ship sustainment.

Senator KING. Exactly. Well, I'm glad to hear about the additive manufacturing. My belief is that there should be a 3D-printer on every ship and in every hangar and that we should be buying the IP when we buy a platform so that we can maintain and build parts in a much more efficient way.

Admiral HOUSTON. I absolutely agree. The carriers do have printers on them. Some of our submarines have actually deployed with printers and they've actually additively manufactured some components already for that. We need to expand that, and it's more about speed now than it is so much about the process you use.

We find with additive manufacturing that—it's faster than some of the just pure casting, pouring molten metal into sand, and then removing all that excess metal. It is all that work that you have to do is taking away from actual production time that you could be using for other things.

So, I absolutely see it the same way as you do and we just have to keep on leaving the way.

Senator KING. I appreciate that and I can't resist mentioning that the University of Maine has the largest 3D-printer in the world and last year they printed a house. So, it's an amazing technology that I think is going to change everything but it could also help us with maintenance of our naval and in fact air and armed forces assets.

Mr. White, I mentioned in my opening the cost of the estimated cost of half a trillion dollars. You mentioned in your comments,

looking at different technologies and techniques, is there any hope of finding technologies that will enable us to meet our obligations at the same time? Maybe chip away at that \$500 billion?

Mr. WHITE. Senator, thank you for that question. I absolutely think so, and I think some of them we're doing currently and we're working with our State regulators and partners on the agreement we just signed. I mentioned earlier with the State of Washington will allow us to explore alternative treatment technologies for the bulk of our tank waste there, the low activity portion of that.

This Committee supported our Test Bed Initiative in the past which looks at commercial disposable and grouting options. I think just that ability alone to do with the low activity piece of the tank waste in that fashion would save hundreds of billions of dollars beyond just simply vitrifying the waste.

There are other things we can do that this committee has supported, our R&D efforts, looking long range at our tank waste mission. One of the things folks don't always think about in terms of our tank is we have about 50 million gallons at Hanford. but over time because of the way we have to retrieve the waste. We use water to retrieve it, you end up having to treat about 150 million gallons of waste because you have to create more waste as you retrieve what's there to be able to treat it. Part of our R&D effort that we just awarded this past year, for example, is going to our laboratories to look at alternative retrieval technologies so that we can reduce the amount of water that we have to use in retrieval to ultimately be able to reduce the amount of tank waste that we have to treat.

So, I think there are opportunities like that across the enterprise, and we're trying to take advantage of those.

Senator KING. Could you hazard an estimate as to when Hanford will be done?

Mr. WHITE. I can give you an estimate, Senator, but I can almost guarantee you that I would be wrong. I think our best case for getting done if we can work through our technical challenges and use alternative treatment technologies could be as early as the 2060-ish timeframe. I think if we—

Senator KING. 2060?

Mr. WHITE. Yes, sir.

Senator KING. Wow.

Mr. WHITE. It could otherwise be much longer.

Senator KING. Keith Richards might be dead by then.

Senator KING. I doubt.

Senator ROSEN.

Senator ROSEN. Thank you, Mr. Chair. Thank you for holding this hearing.

It's really important. Thank you all for the work that you do. It's so important to us in Nevada as you know and because the Nevada National Security site, it has been called the Battlefield of the cold war and what was then known as the Nevada Test Site.

Those of us in Nevada still call it the Nevada Test Site, it was ground zero for the majority of our Nation's nuclear tests where 100 atmospheric and 828 underground tests were conducted from 1951 to 1992. We know these tests contaminated our soil, our groundwater, the facilities in the area, and cleanup is still ongoing.

Mr. White, can you please provide us an update on the cleanup projects within the security site? Do you have the adequate resources to complete the task?

Mr. WHITE. Thank you for that, Senator, and I very much appreciate the support from Congress over the last couple of years and adding additional funds to our cleanup budget in Nevada. I think that's helped us in a couple of cases. We've been able to install more robust inspection capabilities for our disposal activities there, and we've been able to optimize some of our D&D [design & development] efforts.

Right now, we're very much focused on what I think is a historically interesting part of the site where some of the nuclear rocket work was done. So, the test cells and the old facilities that were being D&D'd within our current approach. We should be able to get that work done by the 2030 timeframe.

Senator ROSEN. Wonderful. Thank you.

Administrator Hruby, today the site conducts the subcritical experiments to verify the reliability, the effectiveness of our nuclear stockpile so that we never ever have to return to the days of above or below ground testing, explosive testing. So last week, this first subcritical experiment in roughly 3 years was conducted in the principal underground laboratory for subcritical experimentation. Much easier to say pulse facility, and so, can you discuss the importance of that experiment?

Why subcritical experiments and other experiments taking place as Nevada National Security Site are vital to our stockpile stewardship and ensuring that we can continue to certify the stockpile without again, ever returning to underground explosive nuclear testing?

Administrator HRUBY. Yes. Thank you, Senator Rosen, it's good to see you again, and we're very proud of the fact that we had a successful subcritical experiment just last week. These experiments are so important because they allow us to study actual plutonium without creating a chain reaction.

So, that's why we call them subcritical, and so, we can actually look at the real material under conditions that are important to us under very dynamic conditions. As a result of these tests, we can make sure the aged material still behaving as we would expect it to. We can look at newly produced materials and see if it behaves the same.

We can learn new things by our high-fidelity experimental data collection. So, we anticipate this is the best way to maintain our stockpile without returning to nuclear testing. Especially with the demands that we have right now in our production enterprise, as well as perhaps new weapons that we need in the future to meet these changing global conditions.

Senator ROSEN. Yes, it's important that we do these and we talk about all of our missions and particularly our counter-terrorism mission. We have another thing, not besides having the test site. We have the amazing remote sensing laboratory. I love to go out there. They're doing just wonderful things.

Of course, they're both at Nevada's Nellis Air Force Base and Joint Base Andrews. They provide that emergency response capability and crisis support teams and they are ready to deploy any-

where around the world. The personnel at these bases, I said, I've been out there many times and those of the national security site, they're the Nation's experts in locating dirty bombs, loose nukes, sources of radiation in addition to determining origin and attribution through nuclear forensics.

Madam Administrator, given the critical role that both our facilities play, and remote sensing lab in particular in our national defense architecture, can you speak a little bit about how important our remote sensing lab is and the safety and security that they provide to the American people?

Administrator HRUBY. Yes, absolutely. It is fun to talk to the people who work at these labs. They do amazing things at amazingly short timeframes because everything they do is usually associated with emergency response, and I would just like to say that it's been—it's not only for the American people when a source goes missing or something unexpected happens in the U.S. It's also for the international community, and they've been critical in our work.

Senator ROSEN. Do they have everything they need to continue their mission? I wanted to ask you.

Administrator HRUBY. I do think so. To be honest, they've had a boost because of the supplemental funding for Ukraine. They've done a lot of work for Ukraine.

Senator ROSEN. Oh, I know.

Administrator HRUBY. So that's not in our base budget, of course that's in our supplemental budget. But as a result of that, we've been able to really exercise all the muscles with that team.

Senator ROSEN. Well, we have remote sensing lab and the test site. Amazing teams work out there and I'm proud to go visit them and see the good work they're doing. Thank you.

Senator KING. Thank you, Senator.

Senator Fischer.

Senator FISCHER. Administrator, I just have one more comment and question. First of all, I want to thank you for submitting your unfunded priorities list to the committee earlier this year. I agree with the programs that you listed and I do believe that they warrant this committee's attention and additional funding.

Would you speak to the three programs that are listed SLCM-N, the analytic gas laboratory mission enabling construction project, and then we've kind of talked in the past about the need for the binder, the production and qualification efforts for that, for the insensitive high explosives. Why do you need more resources for those?

Administrator HRUBY. Yes. As I mentioned in my opening comments SLCM-N is a very unique case in this regard that you know, it wasn't in our program of record until the Fiscal Year 2024 NDAA was passed. At that time, we had already submitted our fiscal year 2025 budget request. So, the SLCM-N budget requests when the unfunded requirements is for \$70 million.

That's an amount that we think is reasonable to do what we anticipate needing to do in that program. We're still working very closely with the DOD and the Navy to define the details of that program. But we are going to need some budget to do it. I went through the binder, let me address this binder issue.

Emerging issue has come up as a result of changing environmental regulations concerning forever chemicals that we have a binder material on our explosives that falls into this category of materials that are now being regulated very closely by the EPA. So, we need a new binder material and we're going to work on a new binder material.

But meanwhile, we also have to figure out how to get through the program of record that we have with a limited supply of those particular material and or finding another supplier. So, that's an issue that emerged after the budget was formulated. That's why it's in, and the analytical lab is, again, just to make sure that we have all the facilities we need to make sure that we can analyze what we need to do to produce the pits that we need to produce.

Senator ROSEN. Okay. Thank you.

Thank you, Mr. Chairman.

Senator KING. Okay. Thank you all very much. We'll have our second panel come forward. Thank you. Dr. Adams, are you leaning off?

Dr. ADAMS. Yes.

Senator KING. You are now.

Dr. ADAMS. Some short opening remarks?

Senator KING. Sorry?

Dr. ADAMS. Are you requesting short opening remarks?

Senator KING. Yes, please.

STATEMENT OF DR. MARVIN L. ADAMS, DEPUTY ADMINISTRATOR FOR DEFENSE PROGRAMS, NATIONAL NUCLEAR SECURITY ADMINISTRATION

Dr. ADAMS. Okay, thank you. Yes. So, Chairman King, Ranking Member Fischer and Members of the Committee, it is an honor to be here before you to discuss the President's Fiscal Year 2025 Budget Request for the weapons activities portion of DOE and NNSA's activities.

Thanks to support from this Subcommittee and the full Committee and Congress in general and the efforts of our outstanding dedicated workers across the nuclear security enterprise. We are steadily improving our infrastructure and our capabilities while we are also taking on new challenges as they arise from a worsening global security situation.

The fiscal year 2025 weapons activities budget request of about \$19.8 billion will support our continued commitment to design, manufacture, certify, transport, maintain, and assess the safe, secure and reliable warheads that are needed to keep our deterrent credible and effective.

Toward that end, we have added programs for the B61-13 gravity bomb and the Nuclear Sea Launch Cruise Missile to the other five warhead programs that have been and continue to be in our program of record. We have accepted the challenge of delivering the two new warheads within the same timeframe spanned by the other five.

In fiscal year 2023 as Administrator Hruby mentioned, we delivered more than 200 modernized warheads to the military with all deliveries on schedule. The fiscal year 2025 budget request supports our commitment to continuing on-time deliveries into the fu-

ture. It reflects time phasing of many efforts including construction projects to ensure that capabilities are ready by the time they are needed for warhead delivery.

In closing, I would like to thank again, the subcommittee, the full Committee and Congress for the support that has enabled NNSA to deliver on its important national security missions to date, and I look forward to your questions.

[The joint prepared statement of The Honorable Jill Hruby and Dr. Marvin L. Adams follows:]

PREPARED STATEMENT BY THE HONORABLE JILL HRUBY AND DR. MARVIN L. ADAMS

Chairman King, Ranking Member Fischer, and Members of the Subcommittee, thank you for the opportunity to present the President's Fiscal Year 2025 Budget Request for the Department of Energy's (DOE) National Nuclear Security Administration (NNSA). NNSA appreciates the Subcommittee's ongoing support.

Over the last year, NNSA has met urgent and demanding needs in all three of our missions: nuclear weapons, nuclear nonproliferation, and naval reactors. These accomplishments, enabled by support from the Administration and Congress, took dedication, innovation, and collaboration by the members of our talented nuclear security enterprise workforce.

I am proud to report that NNSA delivered over 200 modernized nuclear weapons to the Department of Defense (DOD) this past year—the most since the end of the cold war. Using the world's most sophisticated tools for nuclear stockpile stewardship and a rigorous surveillance process, we once again certified the U.S. nuclear deterrent is safe, secure, and reliable without nuclear explosive testing. Our extensive infrastructure efforts continue to advance to meet today's needs and, over the longer term, provide a flexible and resilient enterprise for an uncertain future global security environment. Our science is used every day to design, certify, and assess our stockpile and we continue to create newsworthy breakthroughs. The exceptional science in the nuclear security enterprise is foundational to our Nation's nuclear deterrence. NNSA collaborates closely and continuously with DOD and the Nuclear Weapons Council (NWC) to synchronize and plan the modernization of our nuclear deterrent, adapt to an evolving environment, and assure our allies and partners.

NNSA also continues advancing our nonproliferation, counterterrorism, and emergency response efforts. We are actively improving our space-based nuclear detonation sensors, advancing tools for enrichment monitoring, expanding nuclear smuggling detection to new relevant global regions, enhancing and enforcing export controls, and red teaming artificial intelligence models for proliferation risks. Importantly, we are now regularly removing surplus plutonium from South Carolina and have implemented a practical strategy for surplus plutonium disposition over the long term. Using previously enacted supplemental funding, our DOE and NNSA teams support Ukraine with emergency preparedness tools and exercises, radiation and nuclear sensors, and equipment for nuclear power plant resilience. Our nonproliferation and counterterrorism efforts increasingly require close collaboration across other NNSA mission areas and the interagency, and this collaboration is critical to our development and deployment of high impact solutions.

The NNSA Naval Reactors program continues to advance reactor technology to provide a competitive edge to the United States military. Reactors that will never need refueling will be delivered on time for the new *Columbia*-class ballistic-missile submarines, reactor designs for the next generation of fast-attack submarines are in progress, and the construction of the Spent Fuel Handling Facility in Idaho is underway. Additionally, using other funding, Naval Reactors continues to support the trilateral Australia-U.K.-United States (AUKUS) program in close coordination with the Department of the Navy.

The fiscal year 2025 budget request reflects the urgent demands on the nuclear security enterprise to deliver and adapt while exercising fiscal restraint and increasing efficiency. NNSA's fiscal year 2025 budget request is \$25B, an increase of \$862 million, or 3.6 percent, over the fiscal year 2024 enacted level.¹ The fiscal year 2025 budget request prioritizes executing the nuclear weapon program of record including the development of the B61-13, responding to a deteriorating security environment,

¹Fiscal year 2024 Enacted amounts throughout this testimony do not reflect the mandated transfer of \$92.8 million from Naval Reactors to the Office of Nuclear Energy for operation of the Advanced Test Reactor.

advancing naval nuclear propulsion systems, all while simultaneously revitalizing the infrastructure across the enterprise. In addition, our requested budget supports development and application of emerging technologies such as digital engineering and artificial intelligence (AI) that will increase our efficiency and innovation. The fiscal year 2025 budget request affirms the Administration's steadfast commitment to a strong national defense and NNSA's critical and evolving missions.

WEAPONS ACTIVITIES

The Weapons Activities fiscal year 2025 budget request of \$19.8 billion, a 3.9 percent increase over the fiscal year 2024 enacted, supports stockpile management; production modernization; stockpile research, technology, and engineering; infrastructure and operations; defense nuclear security and secure transportation; and information management and cyber security.

Stockpile Management

The Stockpile Management budget request of \$5.14B, a decrease of 3.5 percent from the fiscal year 2024 enacted, supports stockpile modernization, stockpile sustainment, weapons dismantlement, production operations, and nuclear enterprise assurance. The lower request for fiscal year 2025 compared to the fiscal year 2024 enacted is the result of smaller requests for the B61-12 and W88 Alt 370, which reflects these modernization programs approaching the end of component production, as well as the absence of funding for the Sea Launched Cruise Missile Nuclear (SLCM-N).

Stockpile Modernization

The stockpile modernization program budget request of \$2.84B supports six systems in the expanded program of record: B61-12 Life Extension Program (LEP), B61-13, W88 Alt 370, W87-1, W80-4, and W93. Although SLCM-N is not in the budget request due to the timing of the fiscal year 2024 National Defense Authorization Act (fiscal year 2024 NDAA) and fiscal year 2024 budget enactment compared to the development and submittal of the fiscal year 2025 budget request, NNSA will continue to work with DOD and Congress to assure accordance with fiscal year 2024 NDAA Section 1640.

NNSA has achieved 100 percent on-time delivery of the W88 Alteration (Alt) 370 Program and B61-12 LEP to DOD. This represents consistent production progress since our announcement of First Production Units (FPU) in fiscal year 2021 and fiscal year 2022, respectively.

Starting with the fiscal year 2024 budget enactment, NNSA began the B61-13 program in response to the decision to strengthen deterrence and assurance by providing the President with additional options against certain harder and large-area military targets. In coordination with DOD, NNSA will decrease the number of B61-12s built by the number of B61-13s manufactured, resulting in no change to the number of weapons in the stockpile. NNSA appreciates Congress' authorization and appropriation of \$52 million in fiscal year 2024 for the B61-13, allowing us to take advantage of active B61 production capabilities. In fiscal year 2025, the B61-13 program will progress into Phase 6.4, Production Engineering, with FPU expected in fiscal year 2026.

The W80-4 warhead for the long-range standoff missile entered Phase 6.4, Production Engineering, in fiscal year 2023 and remains on track for FPU in September 2027, aligned with the Air Force schedule for initial and final operational capability dates.

In fiscal year 2023, the W87-1 entered Phase 6.3, Development Engineering, a major milestone. The W87-1 will replace the aging W78 warhead, one of the oldest in the stockpile. The FPU for the W87-1 is currently scheduled for fiscal year 2031 to 2032. The W87-1 is the first modernized weapon that will have a newly manufactured pit, which will be built at Los Alamos National Laboratory (LANL) and certified by Lawrence Livermore National Laboratory (LLNL).

In May 2022, the W93 entered Phase 2, Feasibility Study and Design Options, and remains on track for production starting in the mid-2030's. The NWC has directed effort to accelerate the W93 FPU and the fiscal year 2025 budget request supports this effort. The W93 is a new warhead program based on existing designs that will not require new underground nuclear explosive testing. The W93 will meet DOD requirements to enhance operational effectiveness of the U.S. ballistic missile submarine force. The W93 will have new pits produced at the Savannah River Site (SRS). The W93 program is being undertaken in parallel with the U.K. Replacement Warhead program continuing our coordination through the United States-U.K. Mutual Defense Agreement.

The fiscal year 2024 NDAA requires a SLCM-N as part of NNSA's program of record. As mentioned earlier, NNSA is coordinating with DOD to determine warhead requirements and meet congressional direction for this new program. We will continue to keep Congress informed as program offices in NNSA and the Navy are stood up and requirements are better defined.

In addition to the seven modernization programs mentioned here, NNSA has also requested \$69 million in the Stockpile Research, Technology, and Engineering (SRT&E) program to support two Phase 1 system studies for early exploration of hard and deeply buried target defeat and non-ballistic reentry systems. During these Phase 1 studies, NNSA will evaluate potential weapon design concepts that could meet anticipated deterrence requirements.

To continue to increase efficiency and enable future on-time delivery of weapons, NNSA has initiated two efforts: digital engineering and agile product realization. It is our intent to lower the time and cost to deliver a new weapon as we improve our processes and increase the experience level within the enterprise.

With this budget request, NNSA will continue to deliver modernized nuclear weapons on schedule and at pace and will be positioned to do so through the next decade and beyond.

Other Stockpile Management Activities

The Stockpile Management budget request includes an increase of 10 percent over the fiscal year 2024 enacted to Stockpile Sustainment and Production Operations combined, reflecting the increased demands of the existing and modernized stockpile efforts. The Nuclear Enterprise Assurance increased budget request reflects a response to growing threats associated with cyber and digital advances. NNSA has requested over a 50 percent increase since fiscal year 2023 to respond to this new reality. Last, the fiscal year 25 budget request for Weapons Dismantlement is decreased slightly as we balance the needs of the enterprise.

Production Modernization

NNSA's \$5.9B budget request for production modernization is an increase of \$11.7 million, or 0.2 percent, higher than the fiscal year 2024 enacted budget. The increase in Production Modernization reflects disciplined priority decisions in the portfolio and the overall Weapons Activities budget, as well as the availability of carryover balances to address fiscal year 2025 requirements. The FYNSP includes production modernization budget requests that grow at a faster pace in future years to meet stockpile modernization demands as the program spends down carryover balances, particularly in major projects.

Plutonium Pit Production

NNSA's highest production modernization priority is re-establishing the capability to produce new plutonium pits that was lost in 1989 when production at Rocky Flats was halted. The pit production plan includes a redesign and refurbishment of Los Alamos plutonium facilities to support a production capacity of 30 pits per year (ppy) while simultaneously establishing the processes to achieve war reserve (WR) qualified pits for the W87-1.

As work continues at Los Alamos, the building designed and constructed to house the Mixed Oxide Fuel Fabrication Facility at Savannah River is being modified and re-purposed to manufacture at least 50 ppy. The W93 pits will be the first manufactured at Savannah River. Although the W87-1 and W93 programs are setting the quantity and schedule of pit production now, other future weapons will also require newly produced pits. Pit production will be needed to support the stockpile as long as nuclear weapons exist.

The fiscal year 2025 budget request for plutonium modernization is \$2.89B, essentially flat from fiscal year 2024. The decreased budget request for Los Alamos reflects the use of carryover funding to support increased activity in fiscal year 2025. The increased budget request for Savannah River offsets the decreased request for Los Alamos. Additionally, the request for Infrastructure and Operations is higher than the fiscal year 2024 enacted level by \$715 million, or 28 percent, in large part to support the pit production mission.

The completion of pit production capabilities is arguably the largest and most complex undertaking at NNSA since the Manhattan Project. NNSA is working closely with DOD to assure the stockpile will remain safe, secure, reliable, and effective at all times while pit production capabilities are being established.

Los Alamos Pit Production

The fiscal year 2025 \$1.5 billion budget request for Los Alamos pit production and the associated line-item projects is \$266 million lower than fiscal year 2024. The decrease includes a reduction in line-item projects of \$417 million reflecting the use

Uranium

Alongside pit production, the Uranium Processing Facility (UPF) at Y-12 is a top priority. The fiscal year 2025 budget request for UPF is \$800 million, an 122 percent increase from the fiscal year 2023 enacted budget and a 5.2 percent increase from the fiscal year 2024 request. We greatly appreciate congressional actions to support the reprogramming of funds in fiscal year 2023.

The construction of the overall UPF project is now over 60 percent complete. Gloveboxes are installed in the Main Process Building, and over 97 percent of all procurements have been delivered. The current focus of work is bulk electrical installation, with over 60 miles of electrical conduit and cable installed in the last half of 2023. However, due to a variety of issues, including direct and indirect impacts from COVID-19, deficiencies in contractor performance and planning, overly optimistic assumptions on productivity, repeated delays on procurements, and funding uncertainties, the most current UPF project cost estimate is \$10.3 billion and the estimated date for construction completion is late fiscal year 2027 with beginning of operations expected in October 2031.

In addition to making progress on UPF, NNSA is advancing its development of centrifuges and cascades for domestic uranium enrichment and its production of tritium with a fiscal year 2025 budget request of \$662 million, an increase of nearly 12 percent over the fiscal year 2024 enacted.

Other Production Modernization Programs

Other large-scale projects are either starting or moving forward in line with NNSA's weapon modernization and/or safety and security needs. In late 2023, NNSA broke ground on the Lithium Processing Facility (LPF) at Y-12 with construction expected to start in fiscal year 2026 and a fiscal year 2025 budget request of \$260 million. The High Explosives Science and Engineering Facility (HESE) at Pantex continues construction with a fiscal year 2025 budget request of \$15 million, and the Power Sources Capability at Sandia has a budget request of \$50 million. The Kansas City Non-Nuclear Expansion Transformation (KCNEXT), a new real estate acquisition approach to meet NNSA's space needs that will break ground in Summer 2024. KCNEXT is critical to increase capacity of the non-nuclear components. Each of these projects is key to modernizing facilities to avoid infrastructure failure and to increase capacity. As a reference point, KCNSC delivered components containing more than 300,000 parts in the past year.

NNSA recognizes the fiscal year 2024 NDAA statutory language for completion of the High Explosives Synthesis, Formulation, and Production Facility (HESFP) at the Pantex Plant, and the Tritium Finishing Facility (TFF) at Savannah River. Funding for these project schedules was not factored into the fiscal year 2025 request as NNSA's strategy was to prioritize funding of a reduced number of critical projects, and both HESFP and TFF are of a lower priority.

Stockpile Research, Technology, and Engineering

The SRT&E portfolio develops and delivers the tools used every day for design, certification, and assessment of the stockpile without underground nuclear explosive testing; evaluates and accelerates future concepts; improves understanding of weapon response to environmental conditions; and matures technologies for warheads and manufacturing processes. The SRT&E budget supports the infrastructure and workforce to deliver scientific and engineering advances, including both experimental and computational capabilities. The fiscal year 2025 budget request for SRT&E is \$3.17 billion, a 3.2 percent decrease from the fiscal year 2024 enacted and an increase of 7.6 percent from the fiscal year 2023 enacted.

In fiscal year 2023 and fiscal year 2024, Lawrence Livermore repeated its 2022 fusion ignition breakthrough at the National Ignition Facility (NIF) four times, improving gains and achieving a yield of 5.2 MJ in February 2024. We were excited to have the first NNSA Ignition result highlighted by Google as the "most searched breakthrough" in the past 25 years. Also, in fiscal year 2023 and fiscal year 2024, NNSA started significant efforts to mature technologies to manufacture radiation cases, evaluate new explosives formulations, implement artificial intelligence (AI) in science and engineering programs, and establish AI models and testbeds for unclassified and classified work.

The fiscal year 2025 budget request of \$890 million for Advanced Scientific Computing, a 6 percent increase from the fiscal year 2024 enacted budget, enables transitioning LANL's Crossroads system to classified service for weapons assessment and certification, bringing online the first exaflop computer, El Capitan, at Lawrence Livermore. Additionally, the request includes \$50 million to expand the application of AI to assist in maintaining a safe, secure, and reliable nuclear stockpile while reducing cost and schedule by enhancing scientific and material discovery,

design optimization, manufacturing and certification, and expediting the deployment and surveillance phases of a nuclear warhead system.

The fiscal year 2025 budget request of \$683 million for Inertial Confinement Fusion (ICF) will allow NNSA to address near-term weapons physics challenges and build on its repeated success of reaching fusion ignition in the laboratory. The ICF program gives NNSA experimental access to extreme temperature and pressure regimes characteristic of nuclear weapons to support design, certification, and assessment of the stockpile without resuming underground nuclear explosive testing. NNSA is currently recapitalizing and sustaining existing facilities in line with the ICF 10-Year Facility and Infrastructure Plan delivered to Congress in March 2023. The highly visible successes of the ICF program enhance the deterrent by demonstrating world-leading expertise in high energy density science and technology and providing experimental access to weapons-relevant physical conditions previously unattainable in the laboratory.

The fiscal year 2025 budget request for Enhanced Capabilities for Subcritical Experiments (ECSE) of \$240 million coupled with the \$73 million U1a Complex Enhancements Project (UCEP) request will support expansion, construction, and system installations 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 Advanced Sources Detectors (ASD) Scorpius instruments. Experiments with these tools at PULSE will provide capabilities for system-level plutonium aging experiments at the end of the decade and will provide an important capability to assess system designs for ongoing modernization programs.

Academic Programs and Community Support

The budget request for Academic Programs and Community support is \$128 million, an increase of 5 percent over fiscal year 2024 enacted. It is critical for NNSA to support external mission-relevant research, generate a talent pipeline in key areas of science and engineering, and support our communities. This funding is targeted at workforce needs projected to be the most critical.

Infrastructure and Operations

The NNSA budget request for Infrastructure and Operations is \$3.3 billion, including \$3.16 billion for operations and \$144 million for a portfolio of smaller infrastructure projects. The Operations request is 26 percent above the fiscal year 2024 enacted level. This includes increases for operations of facilities, safety and environmental operations, maintenance and repair of facilities, and recapitalization. To deliver our stockpile program from our legacy infrastructure base, especially while revitalization and new construction are underway, this increase is essential. As noted above, increases to both operations of facilities and maintenance and repair of facilities are largely tied to increased requirements associated with plutonium pit production. The other main contributor for the increases is the transition of management of the Savannah River Site from Environmental Management to NNSA. Funding throughout operations of facilities, maintenance and repair of facilities, and recapitalization is critical to ensure that NNSA can transition SRS to an enduring missionsite to support pit production and the broader nuclear modernization program. Additionally, \$240 million of the \$778 million requested for Recapitalization will fund the second phase of KCNEXT, including real eState acquisition of the first manufacturing facility in the KCNEXT portfolio.

NNSA continues to innovate on mission-enabling construction of commercial-like projects to save time and taxpayer dollars while upgrading key capabilities. In 2023, NNSA successfully completed the final three projects initiated under the 2019 Enhanced Minor Construction and Commercial Standards (EMC2) pilot project: new emergency operations centers at Y-12 and Sandia National Laboratories and a new fire station at Y-12. NNSA experienced up to a 30 percent cost avoidance on these pilot projects. In August 2023, NNSA established a new policy institutionalizing the streamlined oversight and management practices from EMC2 for line-item construction projects up to \$100 million, opening the door for future cost and time savings in smaller-scale non-nuclear construction.

Enterprise Blueprint

To better understand, synchronize, and communicate the enterprise's infrastructure needs, NNSA is developing an Enterprise Blueprint. The Blueprint will describe a 2050 vision, including facilities needed across the enterprise and their ties to mission needs. This will help reinforce NNSA's underlying philosophy of responsiveness, flexibility, and resiliency required to meet dynamic demands. A fully developed Enterprise Blueprint is expected in the latter half of 2024. The Blueprint will guide future investment priorities and budget requests.

Defense Nuclear Security and Secure Transportation

The fiscal year 2025 budget request of \$1.18 billion for Defense Nuclear Security, an increase of 14 percent over the fiscal year 2024 enacted, reflects both the transition of responsibility for safeguards and security at the Savannah River Site from EM to NNSA, and the need to keep pace with new threats, particularly uncrewed aircraft systems. The budget request also includes an 8 percent increase for the West End Protected Area Reduction (WEPAR) project.

NNSA is transitioning to a next-generation counter uncrewed aircraft system (CUAS) that will employ an open architecture systems-based approach to address the evolving threat uncrewed aircraft systems present to NNSA facilities and personnel. Open architecture provides the data fusion and integration of open and proprietary sensors to allow NNSA to select the best available mitigation capabilities: radio frequency, directed energy, kinetic, and radar. Combining these approaches will prevent NNSA from relying on a single capability and allows for swift adjustments to incorporate advanced technology. The flexibility gained by this approach allows security planners to customize systems for each management and operating contract mission partner lab, plant, or site, based on unique location conditions. In fiscal year 2025, NNSA will finalize the development of a permanent facility at the Idaho National Laboratory for CUAS testing and evaluation to help security planners identify possible next-generation solutions, outline continuous testing requirements, and improve NNSA's existing CUAS platform.

The fiscal year 2025 budget request of \$371M for Secure Transportation is increased by 4 percent from the fiscal year 2024 enacted. NNSA's Secure Transportation is essential to assure the security of weapons during delivery and return from the DOD and to meet our schedule commitments.

Information Technology and Cyber Security

The fiscal year 2025 budget request of \$646 million for Information Technology (IT) and Cyber Security is 12 percent higher than the fiscal year 2024 enacted in recognition of the increasing threats to cyber security and the ever increasing needs to improve information technology, including technology to support our digital engineering initiative. This request is 45 percent above the fiscal year 2023 enacted to provide increased protection to our high security enterprise.

NNSA faces an increasingly sophisticated and targeted cyber threat environment. We are recapitalizing our information technology (IT) and cybersecurity environments to provide a more resilient and flexible set of capabilities. The fiscal year 2025 budget request prioritizes investments in the IT and cybersecurity workforce, enterprise-scale cyber infrastructure, implementation of zero trust architecture, digital transformation, classified and unclassified commercial cloud-based technologies, and classified wireless systems to improve mission outcomes across the nuclear security enterprise. NNSA is also conducting cyber exercises, including red teaming, to stress test NNSA's cybersecurity posture. We are making these investments to remain poised to address cyber threat and respond to cyber incidents.

DEFENSE NUCLEAR NONPROLIFERATION

The Defense Nuclear Nonproliferation budget request of \$2.46 billion continues critical investment for our nonproliferation, counterterrorism, and emergency response programs at this difficult time in global strategic stability. The fiscal year 2025 request is \$116 million below the fiscal year 2024 enacted level. These changes reflect realistic planning for the pit disassembly and processing element of the surplus plutonium disposition program, responsible use of prior year funds, a one-time \$50 million increase for molybdenum-99 (Mo-99) production in fiscal year 2024, and lower legacy pension costs. The new investments are aimed at responding to the current and anticipated security environment.

NNSA's Defense Nuclear Nonproliferation (DNN), Emergency Management, and Counterterrorism and Counterproliferation Programs (CTCP) are working in lockstep with our allies and partners, interagency counterparts, and international organizations like the IAEA to maintain and advance U.S. global nuclear threat reduction leadership in a shifting international landscape. This work includes cooperation on countering malign State and non-State capabilities, advancing the peaceful uses of civil nuclear energy and nuclear technology while managing proliferation and security risks, minimizing global stocks of excess weapons-usable nuclear material, advancing national technical capabilities in arms control and proliferation detection, and reducing nuclear risks in Ukraine.

Material Management and Minimization

The core objective of the Material Management and Minimization portfolio is eliminating weapons-usable materials or replacing them with less attractive mate-

rial both domestically and internationally. The Material Management and Minimization fiscal year 2025 budget request is \$377 million, a decrease of \$119 million, or 24 percent, from the fiscal year 2024 enacted level. The primary reason for the decrease is the decision to delay the design and construction of a Pit Disassembly and Processing (PDP) Facility as part of the Surplus Plutonium Disposition (SPD) program. The PDP delay, to be re-evaluated in 10 years, allows us to prioritize the removal of material from South Carolina. Part of the rationale for this decision involves the need to prioritize pit production construction and rate production during the same 10-year period that would be needed to stand up PDP capability. This would stress the construction, operational and human resources beyond reasonable capacity at Los Alamos and Savannah River. Although we are delaying PDP, real progress in SPD has been made. We are especially pleased that, following years of extensive planning and coordination, last year the first shipment of down-blended surplus plutonium was transported from K-Area at SRS in South Carolina to the Waste Isolation Pilot Plant (WIPP) in New Mexico for final disposition and shipments have continued on a planned schedule. A total of 111.6 kgs of NNSA surplus plutonium was dispositioned during fiscal year 2023.

Another key activity over the past several years has been assisting the final major global producer of the medical isotope Mo-99 to convert from using highly enriched uranium (HEU) to low enriched uranium, helping to ensure a stable supply of a critical medical isotope while eliminating an associated proliferation risk. A related effort to establish a reliable supply of domestically produced Mo-99 in the United States received a one-time increase in fiscal year 2024 as mentioned earlier, and a plan to utilize this increase is being established in consultation with Congress. NNSA continues to work with partners who have converted research reactors and medical isotope production processes by supplying the high-assay, low-enriched uranium (HALEU) they need to operate. This increasingly includes countries that are looking to alternatives to Russian supplies of HALEU.

In fiscal year 2025, we plan to use the Mobile-Melt-Consolidate system developed by NNSA to begin to eliminate inventories of excess HEU in Norway that previously lacked a disposition pathway. To date, NNSA has eliminated over 7,340 kg of HEU and plutonium globally; the material equivalent to eliminating hundreds of nuclear weapons.

Global Material Security

The fiscal year 2025 budget request for Global Material Security is \$544 million, a 3.8 percent increase over the fiscal year 2024 enacted. Much of the requested growth is in the nuclear smuggling detection and deterrence portfolio. The fiscal year 2025 request is \$196 million, an increase of \$15 million, or 8.3 percent, over the fiscal year 2024 enacted level. NNSA has increased focus on Southeast Asia, the Middle East, and Africa to counter Russian and Chinese activity and influence in those regions. NNSA began cooperation with 16 new partners in the past 2 years, and by the end of fiscal year 2025, NNSA will deploy 78 new counter nuclear smuggling systems.

In addition to the requested growth in nuclear smuggling detection, Global Material Security had a smaller requested increase of approximately \$3 million in International Nuclear Security to expand the nuclear power plant initiative to address sabotage and energy security. This program is taking the lessons from Ukraine to examine vulnerabilities of large nuclear power plants and mitigating risk posed by malign actors who might seek to disrupt or damage these facilities.

NNSA also remains on track to meet the congressionally mandated deadline to replace all cesium-based blood irradiators in the United States by 2027. NNSA's success here goes beyond just cesium-based blood irradiators, in fact, NNSA eliminated over 100 blood and other types of radioactive-source-based devices in fiscal year 2023 in the United States and abroad and expects another 85 removals by the end of fiscal year 2024. NNSA has expanded its work to find technical capable tools to replace those materials posing the greatest risk of radiological terrorism with a greater focus on alternatives to cobalt-60 replacements.

Nonproliferation and Arms Control

The fiscal year 2025 budget request for Nonproliferation and Arms Control is \$225 million, an increase of 6 percent or \$13 million over the fiscal year 2024 enacted. The increased budget request will support new activities to improve safeguarding uranium enrichment plants and develop policy and technical solutions to address risks associated with the global expansion of nuclear energy. The growth is offset by a one-time fiscal year 2024 plus up of \$12 million to accelerate the scope of nuclear verification efforts.

The budget includes funding for Project Carousel, a unique multilateral capability that will allow the IAEA to test and validate technologies and train safeguards inspectors. This facility will come on-line at a critical time to help IAEA explore techniques for monitoring the large growth in civil nuclear energy.

NNSA personnel have been closely involved in efforts to counter Russian and Chinese disinformation and illegal actions while promoting United States and allied interests. This includes working with the Department of State (DOS) and other inter-agency partners to counter Chinese disinformation campaigns aimed at undermining the AUKUS security partnership. NNSA will continue collaborating with DOS and DOD to advance the goals of the partnership while adhering to our obligations under the Nuclear Nonproliferation Treaty and as a responsible nuclear power. NNSA has also lent its expertise to the Global Export Control Coalition to improve the detection of Russia's attempted sanctions evasion to acquire material to support its ongoing invasion against Ukraine.

NNSA supports the expansion of civil nuclear energy to responsible partners globally. Last year, NNSA was instrumental in forging a civil nuclear cooperation agreement between the United States and the Philippines. We provide support to DOS on the negotiation and implementation of nuclear cooperation agreements. NNSA also helps U.S. companies manage their international engagements without sharing sensitive technology. Importantly, NNSA is working directly with nuclear reactor developers to build in international safeguards concepts from the beginning, lowering the longer term deployment costs, increasing safeguards effectiveness, and improving the competitiveness of American industry for foreign deployment.

Nuclear Nonproliferation Research and Development

The fiscal year 2025 budget request for Nuclear Nonproliferation Research and Development is \$803 million, an increase of 4.8 percent or \$37 million over the fiscal year 2024 enacted.

The fiscal year 2025 request will continue to support the Nonproliferation Stewardship Program at about the same level as in fiscal year 2024. The Forensics Research and Development (R&D) budget request is reduced by \$7 million while maintaining existing research life cycle plans and making use of available carryover.

The fiscal year 2025 request for Nuclear Detonation Detection (NDD) is \$323 million, an increase of \$37.5 million, or 13.1 percent, over the fiscal year 2024 enacted level. NNSA delivered to the U.S. Space Force (USSF) the first newly completed next-generation Global Burst Detector (GBD IIF) payload for space-based nuclear detonation monitoring. This new sensor will provide an order of magnitude increase in capabilities at reduced size, weight, and power. The USSF will integrate the GBD IIF onto the first GPS Block IIF satellite as part of the United States Nuclear Detonation Sensor (USNDS). These improved capabilities are increasingly important as tactical nuclear weapons proliferate and the threat of regional nuclear wars increase.

Building from this sensor capability, the R&D budget in fiscal year 2025 request includes increased support for monitoring and verification capabilities for space situational awareness to reinforce arms control and verification missions in support of current treaties, like the Outer Space Treaty. This work protects our national interests and assets, providing information on activities all the way to the lunar surface and beyond.

While Russia routinely violates its arms control commitments and exhibits norm-violating behavior and China has been unwilling to engage in meaningful bilateral or multilateral arms control, NNSA continues to invest in developing infrastructure, human capital, and advanced technologies to meet current and future monitoring and verification needs and prepare for potential future arms control negotiations. Last year, NNSA reached an important scientific and engineering milestone by successfully conducting a chemical explosive test in P Tunnel at the Nevada National Security Site. This experiment advanced our ability to detect very low-yield underground nuclear explosive tests around the world.

The R&D request also includes \$15 million for developing capabilities to produce assessments of how AI models may present nuclear and nonproliferation risks and provide recommendations for mitigating the potential AI threats to national security in light of the rapid pace of rapid technological advancement and innovation.

Nuclear Counterterrorism and Counterproliferation

Counterterrorism and Counterproliferation's (CTCP) core capabilities are to counter nuclear terrorism and nuclear proliferation and respond to any nuclear or radiological incident or accident worldwide. The fiscal year 2025 budget request of \$536 million for the Nuclear Counterterrorism and Incident Response Program, an increase of 6.6 percent, supports planned investments for the second phase of the

Capability Forward initiative by developing a standardized Nuclear Emergency Support Team technical training program focused on actions to secure and defeat weapon of mass destruction (WMD) devices for Federal Bureau of Investigation field office responders. The fiscal year 2025 request also supports technical and policy solutions to counter nuclear proliferation, capability enhancements to counter nuclear and radiological threats—including improved tools to locate, characterize, defeat and conduct forensics on these threats—and training delivery and capacity building for domestic and international partnerships on nuclear counterterrorism and emergency preparedness and response.

NNSA is advancing the Administration’s Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence. As outlined in the Executive Order, NNSA is working with our colleagues across DOE to develop tools to better understand and mitigate the risk of AI being misused to assist in the development or use of chemical, biological, radiological, and nuclear (CBRN) threats.

The fiscal year 2025 request for CTCP’s efforts in this area is \$15 million for developing the capabilities to provide recurring assessments of how AI models may present nuclear risks and provide recommendations for mitigating the potential AI threats to national security in light of the rapid pace of rapid technological advancement and innovation.

As Russia’s full-scale invasion against Ukraine enters its third year, DOE/NNSA’s Ukraine Task Force is working to reduce nuclear risks in Ukraine. This includes providing equipment, training, and technical guidance to enable the safe and secure operation of Ukraine’s nuclear power plants remaining under its control, protect its critical infrastructure, particularly the electric grid, provide situational awareness of any nuclear emergency that occurs in the country, and enhance the emergency preparedness and response capacity of our Ukrainian partners to respond to a nuclear event.

NAVAL REACTORS

The Naval Reactors budget request of \$2.1 billion, an increase of \$173 million, or 8.9 percent over the fiscal year 2024 enacted level, supports NNSA’s close partnership with the U.S. Navy in key areas. The agency is advancing naval nuclear propulsion capabilities to keep the U.S. nuclear fleet 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 infrastructure to enable continued operational success.

The fiscal year 2025 request supports technology development work critical to delivering improvements in reactor performance and reliability, and to support in-service and future submarines and aircraft carriers’ obsolescence and capability needs. The fiscal year 2025 request for Naval Reactors Development is \$868.4 million, an increase of \$48 million, or 5.9 percent over the fiscal year 2024 enacted level.

The fiscal year 2025 request supports the continued safe and reliable operations, maintenance, and oversight at Naval Reactors’ four Naval Nuclear Laboratory sites and the associated contractor workforce. The fiscal year 2025 request for Naval Reactors Operations and Infrastructure is \$763.3 million, an increase of \$51 million, or 7.2 percent, over the fiscal year 2024 enacted level.

The funding request also supports requirements for major initiatives: *Columbia*-class reactor systems development; development of future advanced submarine technology to support next generation designs; and continued progress on base technology development, infrastructure recapitalization at program sites, and decontamination and decommissioning efforts.

Finally, Naval Reactors continues to support the AUKUS partnership through reimbursable work with Australia and the U.K. NNSA will continue its collaboration with DOS and DOD to advance the goals of the agreement while adhering to our obligations as a responsible nuclear power and a party to the Nuclear Nonproliferation Treaty.

FEDERAL SALARIES AND EXPENSES

The Federal Salaries and Expenses budget request of \$565 million, an increase of 13 percent over fiscal year 2024 enacted, supports the recruiting, retention, and development of high-quality Federal staff required to meet NNSA’s growing mission requirements and commitments, maintain the overall health of the Federal workforce, and ensure NNSA is able to provide effective oversight, which is essential to controlling costs and schedule. The increased request helps address the perennially lowest score that NNSA receives in the Federal Employee Viewpoint Survey question that states “my workload is manageable.”

A portion of the increased request is associated with the SRS landlord transition from DOE Environmental Management (EM) to NNSA. We anticipate the SRS transition will include a transfer of 85 FTEs.

NNSA aims to recruit and retain a highly skilled workforce by offering a compelling mission, collaborative work environment, and incentives to compete with the private sector for a limited pool of in-demand talents. NNSA is adjusting its hiring practices to be more proactive to get the right people in the right timeframe.

NNSA appreciates Congress's support to raise the Excepted Service cap in the fiscal year 2024 NDAA.

CONCLUSION

Not since the Manhattan Project has there been a more challenging moment for the nuclear security enterprise. As the only U.S. Government organization capable of designing and manufacturing nuclear weapons, developing technical solutions to nonproliferation, and delivering naval reactors to the fleet, NNSA has a unique role in protecting our Nation and our allies and partners. The fiscal year 2025 budget request recognizes the significantly expanded scope of work in NNSA along with expected increases in efficiencies and fiscal responsibility. NNSA is determined to be proactive rather than reactive in promoting deterrence, strategic stability, and domestic and global security. We appreciate your continued support for the mission and people of NNSA.

Thank you for the opportunity to appear before you today.

Senator KING. Thank you, sir.
Admiral Wolfe.

STATEMENT OF VICE ADMIRAL JOHNNY R. WOLFE, JR., USN, DIRECTOR FOR STRATEGIC SYSTEMS PROGRAMS, DEPARTMENT OF THE NAVY

Admiral WOLFE. Chairman King, Ranking Member Fischer, thank you for the opportunity to testify on behalf of the Department of the Navy's budget priorities for nuclear forces. As Director of Strategic Systems Programs (SSP), my mission is to provide credible and affordable strategic solutions to our war fighter.

For nearly 7 decades, and with Congress's steadfast support, the Navy submarine force has served as the foundation for the U.S. strategic posture, operating on continuous patrol and providing assured second-strike capability.

Since I testified before this panel last year, we have built on this remarkable history of deterrence marking such milestones as: the final demonstration and shakedown operation for our *Ohio*-class ballistic missile submarines; establishment of a new nuclear office for the sea launched cruise missile SLCM-N.

Additionally, in coordination with our NNSA partners, we are initiating a nuclear weapon project to adapt a nuclear warhead for this new capability. This work has not been without its challenges. Long periods of nuclear sustainment have atrophied the domestic industrial base and its critical skills.

Significant investments are required to build back capacity to handle multiple concurrent nuclear modernization programs. Furthermore, we are seeing exceptional inflation-based cost growth due to the aging industrial base, associated supply chain challenges and material obsolescence.

Nevertheless, we must continue to sustain today's deterrent while modernizing for the future. First and foremost, we must maintain the current D5LE missile inventory and provide the necessary operational support to sustain *Ohio*-class submarines through the end of their life in the early 2040's.

Second, along with PEOSSBN, we must continue to ensure a seamless transition between *Ohio*-class and *Columbia*-class submarines. For my command, SSP, this requires a seamless transition of the current Trident II D5LE weapon system onto the new *Columbia*-class ballistic missile submarine.

Finally, one of the greatest advantages the United States has is its alliances and partnerships. For decades, United States policy has recognized the contribution of an independent British nuclear deterrent adds to NATO and indeed global stability. SSP will continue to support and sustain this most important relationship.

Execution of these priorities is only possible through investment in our people, our infrastructure and our industrial base. Nuclear modernization will take time and I echo the Strategic Posture Commission's findings that urgent and comprehensive resourcing and whole of enterprise effort is absolutely essential.

It is only through your continued support that the department's highest modernization priorities can be achieved and the Navy can deliver a reliable sea based strategic deterrent capability. Thank you for the opportunity to testify today on behalf of the dedicated Americans that make strategic deterrents their life's work.

I look forward to your questions. Thank you.

[The prepared statement of Admiral Johnny Wolfe follows:]

PREPARED STATEMENT BY VICE ADMIRAL JOHNNY WOLFE

INTRODUCTION

Chairman King, Ranking Member Fischer, and distinguished Members of the Subcommittee, thank you for this opportunity to discuss the sustainment and recapitalization of the sea-based leg of the nuclear triad. It is an honor to represent the Navy's Strategic Systems Programs (SSP) and the contributions the Navy provides to our national and global security through Sea Based Strategic Deterrence (SBSD).

The Mission Priorities of SSP are to:

1. Sustain the Trident II D5 and Trident II Life Extension (D5LE) Strategic Weapons System (SWS) and ensure Nuclear Weapons Surety on the *Ohio*-class Nuclear Powered Ballistic Missile Submarine (SSBN) and in supporting shore facilities through 2042 while providing Naval Nuclear Weapons Program Technical Authority for Nuclear Weapon (NW) systems and Regulatory Oversight of the Navy Nuclear Deterrence Mission (NNDM). SSP will install and sustain the D5LE SWS onto the initial *Columbia* and United Kingdom (UK) *Dreadnought* SSBNs.
2. Develop the *Columbia* and UK *Dreadnought* SWS and advanced weapon capabilities in the Trident II D5 Life Extended (D5LE2) missile and W93/Mk7 warhead and reentry body assembly.
3. Consistent with congressional direction, SSP will develop and deliver the U.S. Navy's sea-launched cruise missile nuclear (SLCM-N) and non-nuclear, Conventional Prompt Strike hypersonic missile capability to provide the Nation with additional tailored options to deter strategic attacks.
4. Safeguard the special relationship between the United States and UK through the Polaris Sales Agreement (PSA) and Mutual Defense Agreement (MDA), benefiting both nations and supporting the UK's Continuous At Sea Deterrence (CASD).

SSP's core mission comprises two fundamental lines of accountability: 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 unremittingly on our tremendous responsibility for the custody and accountability of our Nation's nuclear assets. The SSP family—our Sailors, Marines, Navy Masters at Arms, Coast Guardsmen, and our industry part-

ners—remain dedicated to supporting the strategic deterrence mission; ready to respond to the emerging needs of our Warfighter, and to protect and safeguard our Nation’s assets with which we are entrusted. We certainly could not do this without the support from this Committee.

STATE OF THE PROGRAM

The Nation’s nuclear triad is the bedrock of U.S. national defense and consists of intercontinental ballistic missiles, globally deployable heavy bombers, and SSBNs equipped with submarine-launched ballistic missiles (SLBM). These platforms and their associated weapons systems are essential to the very foundation of our Nation’s security and survival. The Administration’s 2022 Nuclear Posture Review (NPR) affirms the following roles for nuclear weapons: deter strategic attacks, assure allies and partners, and achieve U.S. objectives if deterrence fails. While the U.S. nuclear arsenal remains safe, secure and effective, most U.S. nuclear deterrent systems—including the SSBN fleet—are operating far beyond their original design life. Replacement programs are ongoing, but there is no margin between the end of useful life of existing programs and the fielding of their replacements. As noted by the 2022 NPR, we need to fully fund the *Columbia*-class SSBN program to deliver a minimum of 12 boats on time, as the *Ohio*-class SSBNs begin to retire. We also need to continue to prioritize near term investments in the submarine industrial base, *Ohio*-class sustainment and the second life extension of the Trident II D5 SWS.

The U.S. Navy provides the most survivable leg of the nuclear triad with the interdependent *Ohio*-class SSBNs and the Trident II D5 SWS. The SSBN fleet is responsible for more than 70 percent of the Nation’s deployed nuclear warheads as defined by the New START Treaty. As the Navy carefully manages the approach to end of life of *Ohio*-class SSBNs, addressing the viability of the SWS throughout the life of the *Columbia*-class SSBNs remains our top priority. *Columbia*-class SSBNs will ensure the effectiveness and availability of the Nation’s Sea Based Strategic Deterrent through the 2080’s. The currently deployed Trident II D5LE missiles will support initial load-outs on *Columbia*, but modernization of the D5LE SWS, via D5LE2, is required to support later *Columbia*-class missile inventory and seamlessly sustain USSTRATCOM requirements. D5LE2 will ensure the SWS will be flexible and adaptable in order to maintain demonstrated performance and survivability despite the dynamic threat environment. The expanding nuclear capability and diversity of two near-peer nuclear armed adversaries, as described by the STRATCOM Commander in his testimony, has placed an even greater demand on the current SSBN fleet. The fleet in the past year has provided strategic messaging with port calls with key allies while still requiring the SSBN to operate even more covertly and maintain a high operational tempo.

SWS SUSTAINMENT ON *OHIO*-CLASS SSBN AND PROCUREMENT FOR *COLUMBIA*-CLASS SSBN

The *Ohio*-class SSBN began a new phase of Sea Based Strategic Deterrence (SBSD) when it started relieving the 41 for Freedom SSBNs in the 1980’s, initially employing the Trident I C4 SLBM and leveraging the nuclear warheads and missile production infrastructure of the original Fleet Ballistic Missile Program. As the U.S. sought to increase the range, accuracy, reliability, and lethality of its SLBM program, in 1988, USS *Tennessee* (SSBN734) dawned a new age of SBSB as she ushered in the advanced Trident II D5 Strategic Weapons System (SWS) in the newly built Kings Bay Naval Submarine Base, specifically designed to support this new weapon system. Over the following decade, as new *Ohio*-class SSBNs were brought online (SSBN 735 through SSBN 743) with the D5 missile system, the early *Ohio*-class SSBNs were also converted from a C4 system to align with the rest of the D5 fleet. Originally composed of 18 *Ohio*-class SSBNs, the SSBN fleet settled on a 14-ship class carrying the Trident II D5 missile system executing SBSB, while the first four *Ohio*-class SSBNs were converted to conventional guided missile and special operations forces submarines (SSGN 726 through SSGN 729). The 14 ship *Ohio*-class SSBN fleet remains the backbone of U.S. strategic deterrence. 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 D5 missiles to update critical but aging missile electronics systems. SSP introduced the Trident II D5 Life Extension (D5LE) program to the fleet in 2017 and will continue through 2025 to convert D5 missiles to D5LE when they are pulled off the SSBNs during normal missile maintenance times.

The final *Ohio*-class SSBN, USS *Louisiana* (SSBN 743), which completed her mid-life Engineered Refueling Overhaul (ERO) last year has returned to support the sea-based strategic deterrent until her scheduled retirement in 2042. SSP must ensure the “no fail” SBSB mission is supported on the *Ohio*-class through 2042, providing a reliable Trident II D5/D5LE weapons systems with W76 and W88 warheads until this final ship of the class is decommissioned. In parallel, SSP’s program efforts and collaboration with the UK through the PSA will support the UK’s Continuous At Sea Deterrence through *Vanguard*-class life and the transition to a *Dreadnought*-class SSBN fleet.

In support of USSTRATCOM, we have recognized the challenges presented by an unprecedented strategic landscape of two nuclear peers who are actively seeking to undermine the rules-based international order. In order to meet emerging threats posed by this environment, SSP has made an effort to ensure greater flexibility to execute our mission, both today and in the future. These investments seek to expand operating environments for the SSBN. As stated by USSTRATCOM Commander, “These long-term investments are critical to ensure a safe, secure, effective and credible strategic force that can defend our national interests.”

TRIDENT II D5 LIFE EXTENSION AND LIFE EXTENSION 2

The Trident II D5 SWS capability has been deployed on the *Ohio*-class SSBN for more than three decades and is planned to be deployed more than 55 years. This demand to maintain demonstrated high performance while extending the service life past initial design requirements required a missile life extension effort, D5LE. The current Trident D5 Life Extension (D5LE) remains an effective and credible Strategic Weapon System on both the *Ohio*-class and *Columbia*-class SSBNs into the 2040’s, supporting the *Ohio*-class submarine through end of service life and serving as the initial Strategic Weapon System for the *Columbia* and UK *Dreadnought*-class SSBNs.

As the Navy carefully manages the approach to end of life of our *Ohio*-class SSBNs, we must address the viability of the SWS throughout the life of the *Columbia*-class SSBNs. A minimum of 12 *Columbia*-class SSBNs will replace today’s 14 *Ohio* SSBNs and beginning in fiscal year 2030, D5LE missiles will support initial loadouts on *Columbia* (Hulls 1–8). Production of additional D5LE missiles is not practical due to obsolete parts and the lack of a robust industrial base. In order to meet inventory requirements and maintain a credible strategic deterrent in the face of evolving threats, a second life extension of the Trident II Strategic Weapons System (D5LE2) is required to be designed, engineered, produced and deployed by *Columbia* Hull #9’s strategic outload. It will be incorporated on UK *Dreadnought* class SSBNs, all follow on *Columbia* hulls, as well as *Columbia* hulls 1–8 during their Extended Refit Period from fiscal year 2039 to 2049 to continue to meet USSTRATCOM requirements. D5LE2’s architecture will ensure the weapon system maintains demonstrated performance and remains survivable while facing a dynamic threat environment driven by two near peer competitors until *Columbia* and UK *Dreadnought* end of life.

D5LE2 is a hybrid of pull-through cost-effective technology (e.g., solid rocket motors, ignitors) and redesigned and updated components (e.g., avionics, guidance, system architecture). D5LE2 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 Sea Based Strategic Deterrent. Fiscal year 2025 activities continue critical Missile and Guidance technology work, commencing multiple subsystem redesigns, industrial base development activities and definitization of system level requirements for the D5LE2 program. The D5LE2 subprogram will achieve Milestone B in 2025.

Unlike SLBM programs of the past, D5LE2 does not have the benefit of a healthy defense industrial base that comes from maintaining production and continuous development. The 2022 NPR reiterated the need for D5LE2 and stated that the United States will prioritize near-term investments to “ensure that D5LE2 is effective in the expected threat environment and delivers on time.” The 2022 bi-partisan, congressionally mandated Strategic Posture Committee Report recommended fully supporting development and deployment of D5LE2 “to ensure U.S. nuclear strategy remains effective in a two-nuclear-peer environment.” In short, full support of D5LE2 today is vital to achieving 2039 Initial Fleet Introduction and to embarking on a path that maintains an SLBM deterrent capability through the service life of the *Columbia* and UK *Dreadnought*-class SSBNs.

The Navy must also recapitalize infrastructure across the breadth of the Navy’s Nuclear Enterprise. The Strategic Weapons Facilities and the Naval Ordnance Test Unit support current SSBN operations in addition to their missions to develop and

produce D5LE2; these facilities require modernization. Consistent and timely resourcing is required to maintain our continuous presence at sea in accordance with USSTRATCOM requirements.

SEA-LAUNCHED CRUISE MISSILE, NUCLEAR (SLCM-N)

The Congress, in Section 1640 of the Fiscal Year 2024 NDAA (Public Law 118-31), directed establishment of a Major Defense Acquisition Program for a sea-launched cruise missile nuclear (SLCM-N). The weapon will contribute a supplemental capability to reinforce theater regional deterrence, a key objective of the 2022 NPR.

In accordance with Section 1640, the Navy has begun efforts to enable a program start, leading to an initial operating capability (IOC) in 2034, as directed by the Fiscal Year 2024 NDAA. In March 2024, Under Secretary of Defense for Acquisition and Sustainment LaPlante, signed an Acquisition Decision Memorandum directing the Navy to establish a program office and begin the analysis phase. SSP is also supporting ongoing discussions between the Administration and Congress on options to execute the SLCM-N program in a manner that balances cost, deterrence value, and risk to the program of record and the Joint Force. Executing this program successfully will require careful balancing of SLCM-N programmatic manning with ongoing Navy programs, which draw from a limited pool of experienced government personnel and the same nuclear weapons industrial base.

Research and development funding appropriated to the Navy in fiscal year 2023 enabled initial development of a Concept of Operations (CONOPS), assessment of the impact to the current attack submarine mission, development of an acquisition strategy, initiation of cost and financial management, systems engineering, requirements development, and logistics planning to prepare for the upcoming Milestone A. The Navy is ready to execute fiscal year 2024 funding as appropriated to complete Materiel Solution Analysis (MSA) concept and feasibility studies, to meet the requirements for a successful Milestone A decision.

WARHEAD AND REENTRY BODY ACTIVITIES

The Navy is also working in partnership with the Department of Energy's National Nuclear Security Administration (NNSA) to refurbish our existing reentry systems and develop new reentry systems in response to USSTRATCOM requirements. As the threat environment the nuclear enterprise faces continues to evolve, it is critical that the Navy designs, develops, and deploys programs that meet the needs of the Warfighter. The Trident II D5 missile is capable of carrying two types of warhead families today, the W76 and the W88. The W93/Mk7 warhead and reentry body system will be designed for use on both the D5LE and D5LE2 missiles and, through the Polaris Sales Agreement and Mutual Defense Agreement (as amended), will support the United Kingdom's sovereign Replacement Warhead program. In 2019, NNSA completed the W76-1 Life Extension Program (W76-1/Mk4A), marking the U.S. stockpile's first full-scale warhead refurbishment program. The Navy continues to work on modernizing integrated aeroshells that house these warheads through the Mk4B program with the inclusion of a Shape Stable Nose Tip, which reduces reentry variability and improves performance margins.

The W88/Mk5 warhead continues to undergo a refurbishment program. The Navy and NNSA coordinated on tightly coupled schedules for the fleet, the nuclear enterprise weapons complex, and production of affected non-nuclear components. This program reached the First Production Unit milestone in 2021 and achieved Initial Operational Capability in January 2022. I am confident that our teams will continue to work together to manage and deliver this program, as we have historically addressed refurbishment challenges with a mission-focused attitude and rigor. The Navy will continue to prioritize meeting our Warfighters' requirements and minimizing disruption to the operational fleet to ensure that the sea-based leg of the triad continues to fulfill its deterrence mission. However, these critical programs will continue to suffer schedule challenges and experience compounding technical and programmatic risk without consistent and timely funding.

W93/Mk7 will provide flexibility and adaptability to meet future warfighter needs. With the near simultaneous age out of the deployed stockpile in the 2040's, the W93/Mk7 will help address production concerns in the weapons complex 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 Department of Defense-Department of Energy Nuclear Weapons Lifecycle Process with NNSA for the W93. This effort will address evolving ballistic missile warhead modernization requirements; improve operational effectiveness for USSTRATCOM; and mitigate technical, operational, and programmatic risk in the sea-based leg of the nuclear triad while simultaneously rein-

vigorating the atrophied industrial base. In fiscal year 2022, the W93 program received NWC authorization to proceed into Phase 2, Feasibility Study and Design Options, which will further refine and mature the design of the W93/Mk7 program in a manner that provides an affordable, credible, safe, and secure weapon to the Warfighter. The W93/Mk7 will not increase the size of the deployed stockpile and will not require nuclear explosive testing. The Navy will work in close coordination with the DOD, NNSA, the NWC, and the Congress as this effort matures.

INDUSTRIAL BASE AND INFRASTRUCTURE

The nation requires a fully modernized nuclear force and supporting infrastructure to execute our national strategy. Our modernization needs cannot succeed without investing in the research and development (R&D), critical skills, and 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 R&D investment. SSP has placed particular emphasis on the solid rocket motor industry and its sub-tier suppliers and appreciates the support of Congress to allow for the sustained production of these vital components. Essential to the nuclear deterrent is a national aeroshell production capability. 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 also our strategic partners in the United Kingdom as they pursue their independent warhead program endeavors. Finally, R&D investment is critical to today's nuclear modernization needs to ensure that we advance necessary technology ahead of design needs and to train our workforce during the early years of development. If the Nation does not continue to address these concerns, no amount of money will be able to adequately mitigate the risks associated with key stockpile and infrastructure losses.

Regarding the program's infrastructure, 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 to process missiles and outfit the SSBNs. Maintaining and sustaining facilities is critical to meeting USSTRATCOM and Fleet mission requirements. We must continue to make smart investments to address capability gaps, through-put constraints, and build in surge capacity to address requirements presented by new and emerging threats. The Administration has shown its commitment to investment in our strategic infrastructure with the funding of multiple MILCON projects in fiscal year 2024 that are required for the on-time delivery of the D5LE2 SWS. We are re-establishing pad launch capabilities on Florida's Space Coast over four decades after the final Trident II D5 X-Flight in January 1989, as well as modernizing and sustaining our Strategic Weapons Facilities that will produce and deliver D5LE2 missiles to the Fleet. 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 NNSA's infrastructure must be prepared to respond in tandem to the evolving needs of the Nation. Of utmost importance, 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 forces 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.

The return on investment in our strategic deterrent capabilities is considerable. Not only do our strategic nuclear capabilities underpin every military operation around the world, but they also assure our allies and partners incentivizing them to work with us, and most importantly provide the ultimate insurance policy against strategic attack on the American people. Today, the national security components of the Federal budget represent less than 15 percent of total Federal outlays. The nuclear component itself is an even smaller portion of these outlays. In fact, if the entire planned procurement cost of the *Columbia* SSBN force were obligated in a single year, it would only account for less than 2 percent of the entire Federal budget. This 2 percent represents a once in a generation recapitalization of the sea-based

deterrent leg and will carry our deterrent force out to 2080—a fifty-year return on investment.

WORKFORCE

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 drove this program 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. A capable, credible, and affordable strategic deterrent for our Nation for the next 60 years requires not only technical, policy, management, and financial acumen—it requires passion and a commitment to making this our life's work.

SSP has made significant strides in recent years to honor our past, innovate our present, and ensure our future workforce is connected to the fundamental global security mission. In order to create the ideal workforce and workplace, SSP developed its first SSP Human Capital Operating Plan (HCOP) in fiscal year 2019. The HCOP is a 5-year plan aligning human capital initiatives to SSP's strategic goals. Through the HCOP, SSP introduced a variety of initiatives to attract, develop, and retain a premier workforce. Building on the success of the previous HCOP, SSP recently issued a new HCOP in fiscal year 2023 with refined strategies to support mission readiness. The three goals and associated successes are outlined below.

Goal 1—Recruitment: continue to implement and elevate creative strategies to recruit highly qualified candidates to meet SSP's current and future demands in support of SBSD 2084. Accomplishments toward this end include: increasing entry-level developmental positions to build a pipeline of talent; implementing the SSP Newcomer Onboarding Workshop to better acclimate new employees to SSP via a cohort structure; developing workforce dashboards to increase the accuracy and transparency of human capital and manpower data; and streamlining hiring and onboarding processes;

Goal 2—Development: build upon SSP's talent base by empowering individuals with technical and professional opportunities to execute the Nation's premier weapons system through a robust portfolio of developmental tools and leadership programs. Accomplishments toward this end include: redefining supervisor expectations; offering supervisor and soft skill training; hosting supervisor luncheons to share resources and best practices; expanding coaching, mentoring, and cross-training opportunities; and developing career path roadmaps;

Goal 3—Retention: communicate and build upon SSP's collaborative culture that strives for technical excellence by implementing effective strategies including fulfilling SSP career paths while fostering a diverse and inclusive workplace where all individuals perform to their full potential. Accomplishments toward this end include: expanding employee recognition to include development of a new award for supervisors; increasing leadership involvement in health and wellness events; and executing a communication strategy to promote participation, communicate results, and develop action plans in response to the Defense Organizational Climate Survey and Federal Employee Viewpoint Survey.

POLARIS SALES AGREEMENT: SUPPORT TO THE UK

Fundamental to U.S. strategic and extended deterrence policies is the special relationship between the U.S. and the UK through the 1963 Polaris Sales Agreement, as amended (PSA) and the 1958 Mutual Defense Agreement, as amended (MDA). Under the PSA, the U.S. sells the Trident II SWS to the UK along with associated defense services. Under the MDA, the U.S. cooperates with the UK on the uses of atomic energy for mutual defense purposes. The two 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 classified information, including atomic information, with the UK. This framework has ensured the United States' ability to support the UK with capabilities to ensure a robust nuclear deterrent. The Common Missile Compartment (CMC) represents the most recent example of the PSA partnership, in which the two nations are designing, developing, and producing common shipboard infrastructure which improves the ease of comingling the D5 missile inventory and sets the stage to improve maintenance system consistency

across the two fleets. SSP will support PEO SSBN throughout the 2020's as they oversee U.S. industry delivery of CMC components to both navies for installation into their new SSBNs. As with *Columbia*, the *Dreadnought*-class SSBNs will initially carry the D5LE missile. The development of the Mk7 reentry system to support the U.S. W93 warhead program is also critical to the development of a next generation nuclear warhead and reentry system for the UK. The two nations are working separate but parallel warhead programs with collaboration between the two.

Last year marked sixty years since our two governments signed the PSA. With sixty years behind us, SSP will continue to nurture and safeguard this special relationship with the UK to sustain the SBSB and support UK Continuous At Sea Deterrence (CASD) of today while modernizing and building flexibility, adaptability, and resiliency into SBSB 2084 and the UK's future CASD.

CONCLUSION

Our Nation's sea-based strategic deterrent has been a critical component of our national security since the 1950's and must continue to assure our allies and partners and to deter potential adversaries well into the future. SSP ensures a safe, secure, effective, flexible, and tailorable 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. I am privileged to represent this unique organization as we work to serve the best interests of our great Nation. I thank the committee for the opportunity to speak with you about the sea-based leg of the nuclear triad and the vital role it plays in our national and global security.

Senator KING. Thank you, Admiral.
General Bussiere.

STATEMENT OF GENERAL THOMAS A. BUSSIERE, USAF, COMMANDER OF AIRFORCE GLOBAL STRIKE COMMAND

General BUSSIERE. Good afternoon, Chairman King, Ranking Member Fischer, and distinguished Members of this Committee.

I'm honored to represent the men and women of Air Force Global Strike Command and provide you an update on our mission, our airmen, and our ongoing modernization efforts, and the challenges in sustaining our legacy weapon systems.

I'd like to thank Congress for its support not only to national defense, but the Air Force's long-range strike and nuclear deterrence missions. My full statement has been submitted for the record.

Air Force Global Strike Command was established in 2009 to ensure focused leadership and oversight of the Air Force's Nuclear mission. I am grateful to the Members of this Committee for your steadfast support as we continue to move forward with the modernization of our weapon systems.

The timely modernization of our nuclear triad which Global Strike is responsible for two-thirds, remains the commands' paramount focus. With our current modernization efforts, including our land-based ICBMs, Bomber Force, Helicopter Force, nuclear command and control platforms, weapons generation facilities and nuclear weapons.

This Committee is keenly aware of the threats facing our Nation today and in the foreseeable future. We currently face the challenge of deterring two major nuclear armed competitors, the People's Republic of China and the Russian Federation. Both armed with modern and diverse nuclear capabilities. Additionally, we are aware of the escalating nuclear threat presented by the Democratic People's Republic of Korea (DPRK), and the possibility of a nuclear-armed Iran.

Not only is the command leading the charge in sustaining current forces in deploying future long-range strike weapon systems, Global Strike Command is acutely aware that the nuclear deterrence mission is the bedrock of our National Defense Strategy and foundational to our Nation's defense and essential to that of our allies and partners.

The Air Force Nuclear Enterprise is at a critical juncture. Our operational margin is razor thin. Our resources are stretched to their limits. 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 Thomas A. Bussiere follows:]

PREPARED STATEMENT BY GENERAL THOMAS A. BUSSIERE

INTRODUCTION

Air Force Global Strike Command (AFGSC) provides strategic deterrence and long-range strike, anytime, anywhere, as mandated by the President and the Commander of United States Strategic Command (USSTRATCOM). Not only is the command leading the charge in sustaining current forces and deploying future long-range strike weapon systems, the command also remains the cornerstone of our National Defense Strategy. However, our command is at a critical juncture. Our operational margin is razor-thin, our resources are stretched to their utmost limits, and the demand for our capabilities remains relentless while our adversaries are increasing and diversifying their nuclear capabilities at an alarming rate. Today, I urgently appeal for your immediate support as we confront these pressing challenges while safeguarding our Nation's security.

AFGSC forces are continuously deployed worldwide, supporting all Combatant Commands (CCMDs). Our missile and bomber forces are deterring every day, ready to execute nuclear taskings and conduct long-range strikes anywhere on the globe at any given moment as part of the Department's integrated deterrence approach. Simultaneously, AFGSC embarked on an historical, crucial nuclear modernization and recapitalization effort, replacing and refurbishing aging bombers, intercontinental ballistic missiles (ICBMs), helicopters, command and control aircraft, and standoff weapons. This strategic imperative to modernize is not just important; it is long overdue. The nation cannot afford a lapse or decline in our force posture as we introduce new capabilities, as part of the Department's broader integrated deterrence approach. We must maintain an unbroken nuclear backstop to underpin all other elements of national power.

As the Commander of AFGSC, my priority is ensuring mission readiness, excellence, and pride in our service to the Nation; service with an amazing history and a boundless future among our "Strikers." These priorities are not just words but the pillars of integrated deterrence, providing crucial long-range conventional and nuclear strike capabilities for our Allies and partners. Despite a shifting and challenging geopolitical landscape, we maintain our ability to execute nuclear options, when directed by the President of the United States, safely and reliably while ensuring conventional strike. Our daily efforts are the bedrock of national defense, a privilege we execute with unwavering dedication. However, dedication is not enough. We need your continued support and stable funding to equip our airmen to compete effectively in this ever-changing and challenging strategic environment.

GLOBAL SECURITY ENVIRONMENT

Currently, the United States, along with Allies and partners, faces the challenge of deterring two major nuclear-armed competitors possessing modern and diverse nuclear capabilities: the People's Republic of China (PRC) and the Russian Federation—who openly stated it is moving nuclear weapons to neighboring Belarus. Additionally, we confront the escalating nuclear threat presented by the Democratic People's Republic of Korea (DPRK) and the possibility of nuclear armament by the Islamic Republic of Iran if it decides to pursue a nuclear weapon.

The PRC continues to be the pacing challenge for the United States as Beijing continues to expand, modernize, and diversify its nuclear and conventional forces. The PRC'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. Beijing remains on an accelerated pace to possess at least 1,000 operational nuclear warheads by the end of the decade, complicating the requirements for United States deterrence globally. The PRC's establishment of new silo fields and new ICBMs will only enhance the degree of survivability, reliability, and effectiveness of PRC nuclear forces. Consequently, Beijing will possess new options for coercive purposes before and during a crisis or conflict. The PRC is also rapidly modernizing air and sea conventional capabilities with next-generation aircraft and enhanced naval strike weapons to keep United States and Allied forces outside of optimum employment parameters in a regional conflict. Thus, the PRC raises the risk to United States and allied forces in the region.

Russia continues to emphasize nuclear weapons in its overall security strategy, even more so as Moscow faces significant conventional losses during its on-going war against Ukraine. It is estimated that as of the end of 2023, Russian forces had suffered 315,000 casualties since the beginning of its full-scale and illegal invasion of Ukraine. By the end of 2024, if the current casualty rate continues, Russian forces will have lost over half a million personnel in Ukraine. While the conventional threat to NATO appears to have waned, Russia maintains a robust nuclear force with modernized systems and a growing arsenal of novel asymmetric weapons. The end of this conflict remains unclear. However, it is evident that President Putin has no intention of halting the fight and losing face. Russia's nuclear rhetoric and signaling continue and remain unresponsive to international messaging and pressure.

While the DPRK is not a rival on the same scale as the PRC and Russia, it 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 the PRC and Russia which provides political cover for the Kim regime's nuclear weapons expansion. The 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 on the Peninsula. A conflict on the Peninsula could involve multiple nuclear-armed actors, raising the risk of escalation and nuclear employment.

Iran does not today possess a nuclear weapon. However, Iran does continue to expand its nuclear program in concerning ways, including by producing highly enriched uranium. Tehran continues to enhance military capabilities, holding the largest inventory of ballistic missiles in the region and funds militia groups and 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 United States designated terrorist organizations and militia groups. Indeed, Iran's longstanding support to Hamas enabled the October 7th terrorist attack against Israel and its 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 United States forces across the region. Should Iran decide to pursue a nuclear weapon, Iran would further challenge United States deterrence and assurance, which is why United States policy is to ensure Iran cannot acquire a nuclear weapon.

OPERATIONS

ICBM Operations

As the nuclear triad's land-based component, the Minuteman III (MMIII) ICBM system is our most responsive strategic deterrent option and maintains the highest degree of nuclear command and control among the triad. Geographically dispersed, reliable, and highly responsive, the MMIII force denies adversaries a perceived first-strike benefit. The MMIII was introduced 50 years ago with a planned 10-year service life. The robust design of MMIII, along with the dedication of our airmen who support ICBM operations and Air Force investments, ensure a high availability rate even as end-of-life margins collapse.

The MMIII weapon system evaluation program evaluates CCMD reliability models and strategic planning factors. There are, however, limitations in test architecture that will impact testing capability as the MMIII moves closer to end of life:

1. Operational Test Launch (OTL) requirements will encounter test assembly scarcity and challenges with fielded missile components.

2. Starting in Fiscal Year 2030 (FY30), the United States Space Force (USSF) Autonomous Flight Safety System Implementation requirement will inhibit MMIII from being launched outside the Western Range. Without a waiver, MMIII testing cannot continue beyond 2030.
3. AFGSC anticipates a rise in range requirements due to MMIII OTL and other Department of Defense (DoD) weapons systems.

Sentinel, the LGM-35A Ground-Based Strategic Deterrent, is intended to replace the MMIII weapons system. The Sentinel program requires the replacement of every facet of the MMIII weapon system, including flight systems, command and control, launch systems, missile silos, control centers, and other ground infrastructure. It's important to stress much of the infrastructure has been in place for over 50 years requiring a substantial replacement effort. In January 2024, the Sentinel program triggered a Nunn-McCurdy breach. AFGSC has partnered with Assistant Secretary of the Air Force (Acquisition, Technology, and Logistics) leadership to support the DOD review of the Sentinel program, as required by the Nunn-McCurdy statute.

As we continue to modernize the land-based leg of the nuclear triad, balancing current operations with modernization will present many challenges—none insurmountable with coordinated, disciplined execution and teamwork. To prioritize these challenges, with the assistance of Congress, I have established the AFGSC ICBM Modernization Directorate. The directorate comprises current and new personnel to ensure a graceful retirement of MMIII. The new directorate is currently operational and anticipates Full Operational Capability (FOC) in fiscal year 2025.

Security Response Forces

Steadfast and highly trained, our nuclear security teams stand ready to defend our Nation's nuclear deterrent. However, leaders face a multitude of new challenges associated with organizing, training, and equipping a substantial force of dedicated professionals in the context of today's threats. Across AFGSC bomber and missile bases, our airmen continue to defend critical assets in extreme environments and traverse vast expanses of the northern-tier missile fields. AFGSC Security Forces manning requirements will continue to increase due to nuclear modernization and transition.

In 2015, the Up Armored High Mobility Multipurpose Wheeled Vehicle (UAHMMWV) was flagged as a safety concern in the USAF Hazard Report submitted to Congress. AFGSC responded to these safety issues by implementing a strategy involving the procurement and deployment of a diversified fleet comprised of Joint Light Tactical Vehicles (JLTVs). The Security Forces enterprise embarked on a modernization initiative for its armored vehicle fleet by introducing the JLTV. The first nuclear security mission with JLTVs was completed in 2023. Headquarters Air Force opted to centralize procurement of the JLTVs, with funding allocated through Air Force Material Command (AFMC). Each JLTV, priced at approximately \$1.2 million, includes essential mission support equipment crucial for Security Forces Airmen engaged in nuclear security. AFGSC anticipates the incremental delivery of 208 JLTVs through fiscal year 2030, enhancing operational safety and effectiveness.

In 2021, AFGSC conducted a Limited User Evaluation of the JLTV which identified the necessity for a mixed fleet of armored vehicles to sufficiently support the unique operating environments and diverse capabilities required for varying AFGSC mission sets. In collaboration with the Pentagon, AFGSC pursued the Armored Utility Vehicle (AUV) as a Level-1 armored vehicle, weighing 12,000 pounds, as opposed to the 22,500-pound JLTV. Following rigorous source selection procedures, the AUV has now entered an open Indefinite Delivery, Indefinite Quantity contract for 303 units, contingent upon funding availability.

To mitigate safety concerns, AFGSC enacted a tactical pause for UAHMMWV use while seeking to rapidly replace the vehicles with the more capable JLTVs and AUVs. The commander-directed UAHMMWV pause enabled a deliberate training and certification relook. Additionally, the pause enabled the restructuring of the vehicle's use in the demanding missile field environments. Today, UAHMMWVs remain available for limited use in the missile fields to ensure operational warfighter readiness.

To complement JLTVs and provide a more effective and safer patrol vehicle, AFGSC seeks to urgently procure AUVs. Any delay in purchasing the AUVs poses a significant risk to our Security Forces Airmen who travel 3.5 million miles a year across ICBM fields. It is imperative that adequate funding and accelerated fielding be utilized to mitigate risk to our Defenders. We need your support for an \$84 million reprogramming action. The reprogramming action will allow AFGSC to secure 301 modified Ford F-350's for the safe movement of Security Forces Airmen conducting nuclear security missions throughout our Global Strike missile field com-

plexes, and ultimately reducing the risk of future mishaps and unnecessary loss of life. I request congressional support to field the AUV.

The fielding of the MH-139 “Grey Wolf” represents a generational leap forward in nuclear security capability for AFGSC, as the replacement for the Vietnam era UH-1N. The capability of the Grey Wolf advances tactical ICBM operations and is essential to securing the ground-based leg of the nuclear triad. In March 2024, the MH-139 program transitioned from the Developmental Testing phase to the Initial Operational Testing and Evaluation (IOT&E) phase. IOT&E is scheduled to conclude in early 2025. The provisional 550th Helicopter Squadron (550 HS) will conduct IOT&E under AFOTEC supervision at Malmstrom AFB, MT. Once IOT&E is complete, the 550 HS will focus on training UH-1N aircrew on the MH-139 platform. The MH-139 program is scheduled to reach Initial Operational Capability (IOC) in late Spring of 2025. Following Malmstrom AFB’s UH-1N transition to the MH-139, F.E. Warren AFB will begin transitioning to the MH-139 in 2026. Minot AFB is scheduled to begin transitioning in 2027. Simultaneous to Malmstrom AFB’s IOT&E, Air Force Reserve Command’s 703 Helicopter Squadron (703d HS) will prepare to take over Flying Training Unit (FTU) duties at Maxwell AFB. The 703 HS expects FTU execution in late 2026.

Bomber Operations

Like the ICBM force, the bomber force is engaged daily. AFGSC bomber forces stand ready to execute nuclear taskings and are poised to conduct long-range strike anywhere in the world. A clear example occurred in February 2024 when two B-1B bombers flew non-stop from the United States, struck Iran-aligned militia group supported targets in Syria, and returned to land at home station, in the United States. AFGSC provides direct support to each CCMD via Bomber Task Force and CONUS to CONUS missions. Our forces consistently operate at maximum capacity, leaving minimal room for operational flexibility or additional surge capacity.

As AFGSC continues to modernize the B-52H and develop the B-21, we must also sustain B-1B and B-2A aircraft until the B-21 is operational at each main operating base. A fully funded and sustained bomber force ensures we have a credible conventional and nuclear deterrent and also the immediate capability to meet Combatant Commanders’ operational requirements. 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, which is codified at 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-1B and B-2A is essential to maintaining AFGSC’s nuclear deterrent capabilities while completing modernization programs impacting all Air Force bombers.

Until the B-21 Raider fleet is fully fielded, the B-1B will continue to play a prominent role in USAF global power projection. To prepare for emerging threats from peer competitors, modernization and sustainment must continue. Today, the B-1B backstops global operations through Bomber Task Forces missions that display the aircraft’s ability to operate from decentralized locations like Luleå-Kallax Air Base, Sweden and Bengaluru, India.

The B-2A Spirit is the only penetrating bomber in the USAF. The platform and crews remain the cornerstone of the bomber force and our nuclear deterrent. However, sustainment challenges have limited the ability of B-2A crews to conduct in-aircraft training. The B-2A is the only penetrating bomber and must remain fully operational, until replaced by the B-21 Raider.

Since the B-21’s inception, top-level key system attributes and performance parameters have remained unchanged. Similarly, since the Engineering and Manufacturing Development contract was awarded in 2016, the B-21 program has remained within its Acquisition Program Baseline for both cost and schedule targets. The Fiscal Year 2025 President’s Budget includes funding to continue development and procurement of the program’s planned Low-Rate Initial Production. Significant remaining milestones for the program include executing the flight test campaign and the start of low-rate initial production. The Fiscal Year 2025 President’s Budget also encompasses modernization activities continuing across the Future Years Defense Plan (FYDP). These activities include conventional weapon integration, air vehicle provisioning, sensors, and continued nuclear certification activities, as well as Long Range Standoff (LRSO) mission integration.

The B-52H Stratofortress continues to be the enduring backbone of United States strategic deterrence. However, the B-52 faces sustainment challenges. Parts obsolescence also increases aircraft down time and leads to higher cannibalization rates of parts from other aircraft. Upcoming engine, radar, and crew interface modifications will present training and simulation challenges for the next generation of aviators and maintainers. To meet mission requirements, available training sorties will

continue to decrease. A lack of training sorties leads to a lack of current aircrew to fly mission lines and an inability to absorb the number of crews required. AFGSC continues to pursue a medium fidelity weapon system trainer to maintain aircrew readiness and increase training quality.

The B-52H Commercial Engine Replacement Program (CERP) and Radar Modernization Program (RMP) are vital upgrades addressing critical sustainment issues, ensuring combat readiness through 2050. The Air Force Life Cycle Management Center's Propulsion Directorate flagged the current B-52H TF-33 engines as unsustainable beyond 2030. Rolls Royce's F130 turbofan was chosen as a replacement for the TF-33. Simultaneously, the B-52H radar faces sustainability challenges due to parts obsolescence. The RMP proposes installing a modified off-the-shelf radar to enhance reliability, reduce operational costs, and allow for future expansion. With RMP planned for IOC at the start of fiscal year 2028 and CERP projected for IOC in fiscal year 2033, any delays or cuts directly impact the B-52H force size. Until engine replacement begins in fiscal year 2031, AFGSC may face periods without enough engines for all B-52Hs. Funding delays or shortages will immediately and severely affect aircraft availability. Prioritizing funding, ensuring parts availability, and optimizing industry partner efficiency are critical measures to maintain program momentum.

Our Air Launched Cruise Missile (ALCM) is also in need of replacement. LRSO is a Major Defense Acquisition Program (MDAP) to design, develop, produce, and deploy a weapon system replacement for the current ALCM. LRSO will replace ALCM on a sortie-by-sortie basis. In March 2023, a successful Critical Design Review (CDR) was accomplished. The LRSO total life-cycle cost is \$29 billion with an Average Procurement Unit Cost set at \$7.85 million base year fiscal year 2021. The planned purchase of the 1,020 missiles includes post-Milestone C production to support fielding with associated weapon system life cycle sustainment and surveillance requirements. Margin and timing with Department of Energy is assessed as a moderate risk to meet the warhead first production unit timeline. The LRSO program remains on track for IOC in 2030.

AFGSC also continues to make progress replacing aging Weapon Storage Areas (WSAs) with single facilities known as Weapons Generation Facilities (WGFs). Nuclear security is a key function of our mission, and these facilities are a major security initiative for the command. The facilities significantly reduce operational, logistical, and aircraft and vulnerability. AFGSC cannot overemphasize enough the appreciation and continued need for congressional support to stay the course in this critical effort. The timing and need for the WGFs are driven by operational requirements and outdated WSA conditions. Currently, five WGFs are in the FYDP. Three are bomber WGFs with one in design planning and two in construction while two are ICBM WGFs with both in construction. Two remaining WGFs are outside the FYDP. The methodical and deliberate process to build these facilities is paying off. F.E. Warren AFB will see the first complete WGF construction this year and is scheduled to reach FOC in fiscal year 2025. The timing and sequencing of the modernization endeavor are critical to sustaining credible deterrence while ensuring deconfliction and support to new mission weapon systems.

Cyber and Unmanned Aircraft Systems

AFGSC faces many challenges due to the changing cybersecurity environment. These challenges have driven new information protection and security standards for all systems, including the Nuclear Command, Control, and Communications (NC3) enterprise. NC3 programs often fail to gain the notoriety of larger acquisition programs. However, the Air Force NC3 weapon system is a vitally important weapons system for AFGSC, the Air Force, and the DOD. NC3 consists of thousands of items spread across multiple platforms and mission areas to include our Airborne, ICBM, Command Posts, and Primary Command Centers collectively.

Built during the cold war, many of our NC3 systems require modernization now to meet the demands of modern cybersecurity. AFGSC continues to work with the Air Force Deputy Chief of Staff for Strategic Deterrence and Nuclear Integration to map out the NC3 cyber terrain and partner with 16th Air Force and AFMC to increase NC3 system security and monitoring. These efforts require dedicated funding to be successful. With sustainment support and funding spread across multiple Program Executive Officers, Program Elements, and Program Offices, the ability for AFGSC to effectively drive consensus and prioritize funding is extremely difficult. We need better alignment, accountability, and transparency of the management of these programs and a clearer answer to who oversees each system and the associated funding streams. NC3 is a no-fail mission. We must elevate the importance of NC3. AFGSC will continue working closely with USSTRATCOM, Headquarters Air

Force, Space Force, OSD, and industry partners to generate the NC3 Next modernization plan.

AFGSC long-range strike forces, both nuclear and conventional, provide the foundation for the security of our Nation. AFGSC continues to incrementally modernize systems for the fight of tomorrow while balancing sustainment efforts for today's force. Soon we will field an Advanced Extremely High Frequency compatible system to support ICBMs and nuclear command posts. We will also field a Senior Leader Network providing critical line of sight communication capabilities supporting senior leaders in times of crisis. Simultaneously, we are developing a modernized very low frequency receiver that will support future waveform and cryptographic modernization upgrades, along with advanced aircrew alert systems and non-satellite based beyond line-of-sight communications systems. We must ensure modernization executes with speed and agility to guarantee seamless fielding all in a cyber contested environment.

Cyber is not the only threat facing our command. The conflict in Ukraine along with the recent increase in unmanned aircraft attacks on shipping in the Red Sea highlight the ever-increasing threat posed by unmanned aircraft, both in number and complexity. AFGSC, with the direct support of USSTRATCOM, has been at the forefront of the Air Force's counter-unmanned aircraft efforts since 2016. Our team of trained Defenders employ equipment that was developed 5 years ago, while the adversary continues to evolve and adapt at the speed of technology. Additionally, our teams operate within the United States and therefore must act in accordance with domestic law and published Rules for Use of Force. While the DOD's Joint Counter-small Unmanned Aircraft Systems Office is leading the overall DOD effort, our AFGSC team is leveraging internal innovation efforts to seek solutions for the specific challenges our forces face from unmanned aircraft, especially as they relate to operations in the ICBM missile fields and defense of our WSAs and WGFs.

Airborne Operations Center

The Survivable Airborne Operations Center (SAOC) weapon system is the replacement for the legacy E-4B National Airborne Operations Center system. The SAOC will provide an advanced command and control capability that is survivable and enduring. Replacement of the E-4B fleet is necessary due to the aircraft approaching end of service life and Air Force sustainment challenges. Diminished manufacturing sources and obsolescence have led to aircraft availability concerns. As the E-4B gets closer to SAOC transition and subsequent end-of-life, AFGSC will need to balance modernization efforts and aircraft availability. To satisfy operational requirements, SAOC will be comprised of a Commercial Derivative Aircraft (CDA), mission system, and ground support systems. The CDA will be hardened to protect against nuclear and electromagnetic effects and modified with an aerial refueling capability, to enable sustained airborne operations. The mission system will integrate secure communications and planning capabilities on modern information technology infrastructure.

AIRMEN AND FAMILIES

While our weapons systems and modernization efforts garner the attention of Allies and adversaries across the world, our Striker Airmen are the reason AFGSC stands ready to face any challenge or threat, 24 hours a day, 7 days a week.

Across various units within AFGSC, our airmen have demonstrated exceptional performance and dedication. Airman-driven innovation is key to advancing mission effectiveness. Our STRIKEWERX innovation team has worked to develop cost-effective solutions to mission obstacles with excellent results in multiple areas, to include platform operations, maintenance, and aircrew training. STRIKEWERX Design Sprints have paired airmen with industry and academia to produce prototypes including B-52 engine pod covers and rapidly deployable shelters. Additionally, our STRIKE Tank Airman innovation competition led to initiating a mobile shielded enclosure prototype for nuclear mission support and an artificial intelligence solution to consolidate disaggregated B-52 aircrew training material into a single accessible mobile application.

Deterrence is grounded in safe, secure, credible, and reliable weapons, operated by reliable Strikers, every day. The maintenance of our legacy weapon systems, while simultaneously modernizing the nuclear force, requires consistent funding, and a supported and sustainable force. To that end, the command is actively reviewing the personnel reliability program to ensure policy guidance, processes, and resourcing aid in the delivery of a credible defense. Part of an airmen's reliability is the knowledge that they and their families are supported medically. AFGSC has partnered with the Defense Health Agency to improve the electronic health record

to meet reliability program requirements and improve access to care in our rural communities. However, we can and must do more.

In 2023, concerns were raised about a potential correlation between missile field service and cancer. AFGSC partnered with the USAF School of Aerospace Medicine (USAFSAM) to lead a comprehensive two-pronged study to examine risks to the safety of our airmen. One arm is evaluating the environment through three rounds of over 2,400 samples, at each of the three Missile Wings and Vandenberg Space Force Base. We have successfully completed two rounds of sampling. In the first round, out of 900 total surface swipes, polychlorinated biphenyls (PCBs) over the EPA threshold were detected on four low-touch surfaces at three Missile Alert facilities (MAFs). The three MAFs were immediately shut down until mitigation was complete. All three MAFs are now operational. All air, drinking water, and soil samples have returned below regulatory levels for chemicals or hazards in both rounds of testing. Radon levels at all three missile wings were below the intervention threshold. To account for seasonal variation, the third round of sampling will occur this spring.

The epidemiology arm of the study is comparing the rates of 14 common cancers in the general population to missile-related career fields using large Government data bases. AFGSC and USAFSAM released the initial set of results from the epidemiology review in February 2024. From the very limited data set of electronic military medical records, the researchers found no increased incidence of non-Hodgkin Lymphoma, and cancer rates within the missile community were consistent with national military rates at the time of the study. The clinical review is now moving to the next phase, which includes the DOD Cancer Registry and Department of Veterans Affairs data. These additional data sets could provide additional insights on potential risks.

Getting results for our airmen, families, and veterans coupled with transparency remains our priority throughout this effort. For our veterans we are communicating and sharing our progress with the Department of Veterans Affairs Military Environmental Exposure Sub-Council. This council reviews potential cases of toxic exposure. We are also conducting a complete review and validation of the hazard assessments and occupational health surveillance for the missile community. The safety and care of our airmen is paramount. AFGSC has hosted five Town Halls with airmen and guardians to keep the missile community updated on results as they come in, followed by immediate notifications to senior leaders and Congress. The safety and care of our airmen is paramount.

Ensuring the retention of our Strikers is critical to maintaining a proficient and ready nuclear force. With specialized training and experience, retaining talent is essential. Recognizing the potential transition of many Strikers to the private sector, AFGSC is conducting a comprehensive analysis focusing on nuclear maintenance, command and control, and security forces Air Force Specialty Codes (AFSCs). These frontline AFSCs are vital for the security and operation of the Nation's nuclear triad. We are evaluating human resource strategies geared toward crafting a distinct and customized plan tailored specifically for the Nuclear Enterprise. Furthermore, we have collaborated with RAND-Project Air Force to undertake an impartial study of our mission, leaving no aspect unexamined in our pursuit of enhancing command excellence.

AFGSC's Force Development Division is the command lead for the deliberate development of AFGSC leaders and nuclear mission professionals. The team plans, develops,

organizes, and executes the Command's deliberate nuclear deterrence and assurance education efforts. Our team specializes in integration of Air Force and command-level programs to address issues related to deterrence education and development to ensure applicability and relevance for specific mission area needs. We leverage the best available commercial technologies to field education programs that develop nuclear mission focused leaders while building an enduring leadership culture across the AFGSC staff, Numbered Air Forces (NAF), and Wings.

As part of its steadfast commitment to airmen development, AFGSC has forged a partnership with Air University to pilot a base-level Professional Military Education (PME) initiative, targeting Intermediate Developmental Education for Majors, Major selects, and their civilian counterparts. The groundbreaking program enables officers and civilians to blend the flexible distance learning elements of Air Command and Staff College with the interactive in-person seminar format provided by in-residence PME. Concurrently, AFGSC has revamped its course curriculum for command teams' pre-command education, which involved a comprehensive redesign of the Squadron Leadership Course and the introduction of a first-ever Nuclear Stewardship Executive Course. The initiative aims to furnish Squadron, Group, and Wing Commanders, as well as their Senior Enlisted Leaders, with a profound un-

derstanding of their roles, responsibilities, and authorities in relation to the nuclear mission of the DOD, USSTRATCOM, and the United States Air Force. Moreover, AFGSC offers highly coveted internships tailored for exceptional officers, enlisted personnel, and civilian Strikers. These year-long programs immerse participants in a diverse array of educational and developmental experiences, including exposure to strategic and national level leadership, academic forums, and international partnerships, all aimed at cultivating future “Strategic Thought Leaders” for the Nuclear Enterprise. Upon successful completion, graduates are selectively placed in assignments designed to maximize their unique skill sets. Furthermore, AFGSC spearheads Aviation Inspiration Mentor outreach efforts through Project Tuskegee, a community engagement initiative aimed at informing, influencing, inspiring, and attracting the next generation of rated and non-rated operators. Since inception in 2022, Project Tuskegee has reached hundreds of thousands across various communities, showcasing opportunities within AFGSC. Through strategic partnerships and engagements at national-level events, Project Tuskegee aims to recruit talented individuals from diverse backgrounds to contribute to key modernization efforts such as the MH-139A, B-21 Raider, and B-52J, thus shaping the future landscape of AFGSC operations.

Caring for airmen and families remains a sacred duty. We are falling short at our Child Development Centers (CDCs). Hiring challenges are the primary driver of shortfalls at installation CDCs. The Department of the Air Force (DAF) implemented various hiring and retention incentives which has increased the CDC staffing levels from 72.6 percent in February 2023 to 82.4 percent in February 2024, reducing the unmet childcare need by 222 children. There are limited options within the local community at some locations. DAF works to support those families through subsidized childcare programs. Wings are also implementing initiatives to combat these gaps. The Malmstrom AFB school liaison officer championed a pilot “Transitional-K” program for military children. This on-base CDC early childhood development program intends to address childcare issues and enhance academic performance. The pilot program includes 18 military families with support from local high schools and the local university to help children transition between pre-K and a kindergarten educational environment. The program helps offset childcare needs and allows military families access to early childhood development resources.

Minot AFB has received top priority from Air Force Installation and Mission Support Center to plan, design, and construct two additional classrooms and renovate an existing classroom into two separate rooms. This initiative will enable the care of 30 more children. Furthermore, Minot AFB has implemented a \$5,000 hiring incentive for an 18-month commitment as part of recruiting and retention initiatives. A healthy CDC is critical to the readiness of an individual and should be looked at as a no-fail mission. Support from Congress that improves hiring, facility upgrades, and other efforts will not only help AFGSC but will benefit the entire Air Force. Simply put, our command needs congressional support to fund initiatives geared toward bettering the lives of our airmen and families.

Despite efforts by many, military spouses continue to face employment challenges; in fact, military spouses experience an unemployment rate among the highest in the country at approximately 21 percent—around seven times the national average. Montana took the challenge head-on and Malmstrom Air Force Base spouses have been positively impacted by the Montana Board of Public Education voting to adopt Montana Superintendent Arntzen’s recommended changes to teacher licensing. These revisions allow for flexible approaches to help address the retention and recruitment of teachers. Additionally, the changes specifically allow for licensure reciprocity for military spouses and dependents. We expect other State legislatures will follow to support the remainder of our installations.

AFGSC actively addresses violence prevention and response across its installations, focusing on filling Integrated Primary Prevention Workforce and True North provider positions. However, the nationwide shortage of mental health providers presents challenges in attracting and retaining qualified candidates, particularly in rural areas. Efforts to incentivize service in difficult-to-fill locations aim to position AFGSC as a premier command. AFGSC anticipates participating in pilot programs to enhance airmen and their families’ resilience and response capabilities. Recently, a Resiliency Response Concept of Operations was developed to augment Disaster Mental Health guidance, ensuring coordinated support at installation, NAF, and Major Command levels. While the primary goal is prevention, the workforce remains prepared to respond swiftly and effectively, providing necessary support as situations demand.

AFGSC Strikers undertake the daunting task of executing two-thirds of the Nation’s nuclear triad mission, a responsibility demanding unparalleled complexity and resilience in the face of rigorous conditions. The mission unfolds against the back-

drop of a monumental 40-year, \$290 billion recapitalization effort, comparable in scale to the Eisenhower InterState System. Recognizing the distinct challenges posed by the command's diverse locations, extreme climates, and mission demands, my team is diligently exploring various retention tools and strategies. These initiatives are aimed at aligning the priority of our talent management programs with the paramount importance of the Strategic Nuclear Deterrence mission. By advocating for transparency, flexibility in assignment selection, and financial incentives to retain seasoned talent through enhanced quality-of-life measures, we strive to foster a supportive environment conducive to mission success. However, the realization of these enhancements hinges on crucial congressional support, necessitating continued funding to address outdated facilities and sustain our vital mission capabilities.

CONCLUSION

AFGSC is acutely aware of the need to sustain our current force and modernize rapidly. We are prepared, yet we are close to being outpaced to meet the demands we find in today's world. Despite having a robust plan that paves the way for our future force, we have no operational margin. The preservation of our legacy force remains a vital national security objective.

Unparalleled operational parameters and an uncertain world confront the command daily. Our imperative is to uphold FOC to fulfill national security mandates, even as we integrate cutting-edge weapon systems. The presence of legacy systems mandates ongoing funding until full divestment can be achieved. Ensuring the execution of modernization efforts is imperative to maintaining credible deterrence.

We cannot slow down. AFGSC is building the force to face an uncertain future. Every portfolio is being modernized, from new sixth-generation aircraft to more capable Grey Wolf helicopters. However, the military-industrial complex is not keeping pace. Already, delays, inflation, and expanding overhead are chipping away at time margins and resources. Simply put, we need continued advocacy and bipartisan effort to field new capabilities and divest the old.

Our airmen and their families are the bedrock of AFGSC, enabling sustainment, modernization, and deterrence. AFGSC and the Nation have a duty to address the challenges our airmen and families face. We are obligated to provide our airmen with solutions to health concerns, access to necessary medical care, adequate childcare, and opportunities for education and personal growth. By taking care of them, they will take care of the mission.

AFGSC thanks Congress for its commitment to our command's national defense mission through strategic deterrence and long-range strike. The success of our efforts to develop and maintain these vital capabilities for our Nation relies on coordination with Congress and the support you provide.

Senator KING. Thank you very much, General.

Admiral Wolfe, we who work in this area so frequently sometimes things just go by and we take them for granted. You said something very important in your opening statement about a secure second-strike capability. Why is that so important to deterrence?

Admiral WOLFE. Yes, sir. I mean, obviously if you think about it from the adversary's perspective, anything that they may think they could do as an initial strike, the SSB enforce is always out there on alert, on patrol, unknown where they're at.

But certainly, if ever called upon, they are survivable and could ensure that a second strike from our Nation could be performed. So, that is absolutely critical as you look at deterrence and what it means.

Senator KING. So, the idea is that the adversary can't think that they can knock us out entirely with one strike. If you've got the survivable at sea capability, that must give them pause. That's the theory?

Admiral WOLFE. Yes, sir. That's absolutely correct.

Senator KING. Thank you.

Dr. Adams, many of the production lines and I think you touched on this in your testimony for the components have been dormant

for many years. Do we have the physical assets and the people to be able to bring those lines back in order to meet the demand that we're seeing in our modernization?

Dr. ADAMS. Yes, sir. We do. Thank you for that question. Yes, thank you. I'll repeat my answer. Thank you for the question, Senator King. The short answer is yes, sir, we do. We don't have a lot of margin. We have to time phase things carefully so that we deploy the needed capabilities in time for when they're needed for given warheads.

As I think you know, as we progress through our program of record, successive warheads will require more and more of the components to be newly manufactured, as opposed to reused. That's an integral part of what goes into our planning and our budget requests that support that planning. But the answer is yes, we can do it.

Senator KING. Is there an end date to a nuclear warhead? In other words, I've seen in New Mexico, those rows and rows and rows. Is there some point where they're deemed useless and we have to reprocess? What's, what's the estimated lifespan of a nuclear warhead?

Dr. ADAMS. The answer is different for different warheads and it's different for different components. We are conservative bunch by our nature and by the importance of our mission. We don't certify things to be out in the stockpile unless we are highly confident that they can still meet all the military requirements.

If there's an exception to that, we duly note it and work with the services and DOD to accommodate those exceptions. But we do retire our warheads and we dismantle them and we do recycle that material.

Senator KING. That's when that material can go to Admiral Houston for Naval Reactors.

Dr. ADAMS. It goes various places. We recycle the material that goes into our newly manufactured warheads. For example, the plutonium we will use for pit production will be recycled. The highly enriched uranium that we use for our warheads is recycled and of course, yes, it's older secondaries that are the source of material for Naval Reactors and also for some other defense related and NNSA related uses.

Senator KING. Thank you.

General Bussiere, you're engaged in the overseeing and in many ways managing the Sentinel rebuilding. Are you satisfied that we have the organizational structure to manage that process? Because as you know, we're facing a Nunn-McCurdy breach? I think it's important to note that the problem is not the missiles, but the civil works.

Do we have the structure and the people in charge that are necessary to make sure we can get beyond that and get that project moving forward?

General BUSSIÈRE. Senator King, that's an excellent question as it relates to how we're rebuilding the management team that oversees the Sentinel Weapon System.

Senator KING. Is your mic on? I'm having a little trouble—could you get a little closer to your mic, please?

General BUSSIÈRE. Yes, sir.

Senator KING. Thank you.

General BUSSIÈRE. So, as you know, in NDAA 2023 we were directed at Global Strike Command Stand Up. A site activation task force relating to the transition from Minuteman III to the Sentinel Weapon System. That director had stood up last August and General Connor is the General Officer I put in charge of that.

As you know, the 2024 NDAA requires the Department to look at those various different authorities within the Department of Defense that should be delegated to that task force to oversee the transition from Minute Man III to the Sentinel Program.

Senator KING. Do we have the structure that we need?

General BUSSIÈRE. We haven't returned back to Congress with our recommendations on those responsibilities primarily because of the pause with the Nunn-McCurdy process going through right now. So, we still owe that answer from the 2024 NDAA back to Congress.

Senator KING. So, we'll look forward to having that because this is one of the most important and frankly expensive projects that we have underway and we really—I'll sleep better at night if I know somebody's in charge. My philosophy of management is you want one throat to choke. I think we need to be sure that there's somebody who's ultimately responsible for this.

General BUSSIÈRE. Yes, Senator, and I think you're looking at him.

Senator KING. Thank you. Thank you for volunteering, Senator Fischer.

Senator FISCHER. Thank you, Mr. Chairman. Thank you, gentlemen for being here today and thank you for your service.

Admiral Wolfe, one of the recommendations of the Strategic Posture Commission's report was to, "accelerate development and deployment of D5LE2." How is your organization evaluating different avenues to ensure that this critical update is available as soon as possible?

Admiral WOLFE. Yes, ma'am. Thank you for the question. So, where we're currently at right now. We are within a year of getting to what we call milestone B, which is really where we will settle in on what the trade studies have told us the right architecture's going to be.

Then where we start to get the entire program in alignment to move forward to understand what the schedule will really be to first meet where we know we need to get which is in the late thirties when we run out of current assets. But then once we anchor that, that will give us the opportunity to look to see if there are any opportunities to accelerate.

We are certainly aware of what the Strategic Posture Commission recommended, and as we go through this, that will be taken into account as we start to lock in that program.

Senator FISCHER. You have a really important responsibility just to manage the transition from the *Ohio*-class to *Columbia* to make sure that we have the warheads necessary to put on those boats that are out there. How are you managing all of that? What input do you have there? Because that's what 60, 70 percent of warheads that are, that are deployed?

How are you able to control the timeline and make sure we can meet it by getting all these—all of the factions together?

Admiral WOLFE. Yes, ma'am. So—

Senator FISCHER. Administrator, Dr. Adams, you know, how's this going to—

Admiral WOLFE. So, I think it's a whole-of-Navy effort with the way we originally structured the way we would transition between *Ohio* and *Columbia*, and that's why if you look at the decision that was made when we said we were going to have a replacement for *Ohio*.

We made the decision that ostensibly the weapon system that I'm responsible for and the warheads that go on that weapon system, we are ostensibly picking that up and moving it to *Columbia*. So, from a design development perspective although there are a few differences it's essentially the same system.

As we manage this transition the way we've done it is as an *Ohio* will come offline, we take those assets and then we'll load those onto a *Columbia*. So that's how we guarantee that when we are asked to meet Operation Global Citadel requirements for U.S. strategic command, we have the assets, we have the timing because we will not download anything before we know we've got the new platform to upload.

So, I'm able to manage all of that with the assets we have so that as the timing works, we control when that will occur.

Senator FISCHER. There will not be a gap?

Admiral WOLFE. No, ma'am. As a matter of fact, as you are very aware to ensure that there's not a gap although not in my portfolio, the Navy has decided we are looking at a certain number of *Ohio*-class that we could potentially extend in the event that a *Columbia* may show up late. So, we can always meet the STRATCOM requirements of Operation Global Citadel. Yes, ma'am.

Senator FISCHER. Thank you very much. General Bussiere, nice to see you, sir. I am pleased to see that the Air Force has moved forward with SAOC. Can you provide us with an update on the program and how fiscal year 2025, the budget request is going to support that specific part of our NC3 architecture?

General BUSSIERE. Yes, Senator Fischer. We're really excited about the decision and the announcement of the industry partner that was selected for the Strategic Airborne Operations Center, Sierra Nevada Corporation was selected by the Department. The threshold number of the platform is six aircraft with the objective number of the platform is eight aircraft.

The 2025 budget, I think like we previously had talked about briefly is primarily for research and development. As well as starting to look at some of the construction projects required for the additional aircraft, they'll be based it off in Air Force Base in Omaha.

Senator FISCHER. Thank you.

Senator KING. Senator Kelly.

Senator KELLY. Thank you, Mr. Chairman, and thank you to all of our witnesses for being here today.

I'd like to talk a little bit about the submarine launched cruise missile, the nuclear version SLCM-N. Development of SLCM-N has been driven by a perceived need for deterrence against the growing Russia and China nuclear threat. Russia, as we all know, main-

tains a stockpile of maybe about 2,000 low yield tactical warheads, and has an employment doctrine that envisions some limited nuclear use.

The SLCM-N is theoretically meant to ensure that our adversaries know that we have the ability to respond in kind. In short, it should give us more flexibility, but I'm concerned that we are spending money in taxing our manufacturing capacity for a redundant capability.

With the addition of the B61-13 and the SLCM-N, the National Nuclear Security Administration has a lot on it plate. We're also developing a W76-2 low yield warhead and the Air Force is soon going to have the long-range standoff missile on a B-21.

It's W80 warhead has a low yield option with it. I'm also concerned about the changes we would have to make to *Virginia*-class subs to accommodate SLCM-N. So, Vice Admiral Wolfe what would it cost the Navy in time, funds, long-term limitations to take conventional torpedoes off of our attack submarines to accommodate a low yield nuclear weapon, SLCM-N.

Admiral WOLFE. Yes, Senator. Thanks for the question. So, certainly we've started to look at that and actually there is a report out already to Congress at the classified level for some of those initial impacts but based on where the NDAA this past year asked us to go look and with support from this Committee and others, we've asked for flexibility because we absolutely recognize, yes, there will be some impact to our SSN force.

But if you look at the options that it provides to the President and if we're allowed to go look at how to not impact anything else to your point with the nuclear modernization that we're already doing for the triad which is absolutely fundamental, we are looking at what options we can provide that will give us that capability with minimum impact for both the Navy and for NNSA to go make this happen.

So, we are in the process of looking at all that right now with the added flexibility that we've asked for today.

Senator KELLY. I read the report yesterday and you say limited impact and I don't want to get into details of a classified report, but some of it did not seem like the different options that were given were not limited impact.

I want you to go into a little bit about what would we need to do to a *Virginia*-class sub in terms of modifications and cost to the sub itself, and to the extent you can do it here, a little bit about how the operations could change for—in order to put that capability onto a *Virginia*-class attacks up.

Admiral WOLFE. Yes, sir. So, certainly from a cost perspective it would be premature to give you an exact cost of what we think a program like that would cost. That's why part of what we're going to look at in this next year is to your point. What solutions are out there that would minimize the number of modifications we would have to make to one of our SSNs?

You particularly pointed out *Virginia*, there is no doubt that based on the solution, the impacts could be great, greater or they could be less depending on which is why we've asked for the flexibility to be able to go look at multiple solutions to try and weigh that. That's from an impact to the actual platform.

We believe that there's other things out there and and I can't talk about them here that might get us to a capability that would actually and I do believe, minimize the impact of modifications we would have to make to our SSNs. We're going to understand that. Now, from an operational perspective, you're absolutely right.

Anytime you have a conventional mission with a nuclear mission, you have to be very careful to segregate those and make sure that our war fighters understand how that operates. Again, as we come through material solutions impacts to the fleet will also be taken into account as we get through what a solution would look like.

Then it's just going to be a matter of what would the cost of that solution be as we lock in and what support do we need to go make that happen?

Senator KELLY. One big concern I have is when you look at a conflict between the United States and a near peer adversary that has maybe in some cases could have a bigger fleet both in naval and merchant vessels, our submarine capability is substantial. It's significant. It would, it would weigh heavily in that kind of conflict.

When I think about the probability of firing a conventional torpedo, you know, out of a submarine, you know, out of a torpedo tube and the likelihood of having to do that multiple times and just the rather shallow depth of a magazine and not a lot of rounds you have aboard the sub. Sure, certainly you could—re reload but that takes some time and there's risk involved in doing that.

Weighing that with the very unlikely event that we would deploy a tactical nuclear weapon in combat, one of my biggest concerns is that we would be giving up something we really need for something we are unlikely to use.

Admiral WOLFE. Yes, sir. I appreciate that, and certainly, all of those discussions will take place as we look at what—how do you weigh options available to the President for a deterrent capability as opposed to a conventional capability. Certainly, the next year will inform us a lot more on how we're going to get at being able to balance all of that.

Senator KELLY. Alright, thank you, Admiral. Thank you, Mr. Chairman.

Senator KING. To followup, Admiral, the theory is that if all we have is massive retaliation, that's not credible in response to a tactical use by an adversary. Isn't that really what we're talking about here?

Admiral WOLFE. Certainly, in a regional conflict, absolutely, sir. There is no doubt, to Senator Kelly's point, although we have deployed a 76-2 and we're done with that. So, we've gotten that impact out of NNSA. You know, you ask yourself again, is that a credible scenario?

If you're trying to deter a regional contract, all of those things are being taken—

Senator KING. The Russians are talking all the time about using the possibility of using nuclear weapons. Senator Kelly points out part of their doctrine; escalate to deescalate.

Admiral WOLFE. Yes, sir, and it really is a matter of as you talked again earlier about a second-strike capability. Anything that we can do to cause China or Russia to have pause on whether they

would even consider any type of nuclear response. That's really what we're trying to get after with all these systems.

Senator KING. Thank you. I want to ask a very basic question. The idea of the *Ohio*-class and then the *Columbia*-class with the ICBMs goes back, I don't, with ballistic missiles, sorry, goes back many years. That decision was made, I don't know, 30, 40 years ago when this was first being discussed.

Are we making a mistake by sticking with ballistic missiles and not moving toward hypersonic cruise missiles or some—in other words, the problem with—we had a hearing last week with the Missile Defense Agency, a ballistic missile, Sir Isaac Newton can tell you where it's going to land.

I wouldn't say it's easy to intercept but it's much easier to intercept than a maneuverable cruise missile. Should we be thinking fundamentally about are we putting a seventies or eighties weapon on this modern submarine? Maybe we should be thinking about what these submarines are going to be armed with.

Is that an off the wall idea or is that something that you're thinking about?

Admiral WOLFE. Sir, that's a difficult question to answer in an unclassified scenario. I'd be more than happy to have that discussion in a classified setting. But here's what I would tell you. Based on technology and the things that we're all experiencing, there is no one solution that fits every scenario where we could think about how we would credibly deter our adversaries.

So, I think certainly the triad that we have today still remains the bedrock and the foundation of our nuclear deterrent capability. There is no doubt when we talk about things like sea launch cruise missile or we talk about some of these other things, there is a place for them and those discussions need to be had in the future.

Senator KING. I just want to be sure those discussions are happening and that we're not just doing what we've done. You know, we've never done it that way before, I hate that attitude. So, I just want to be sure there are those discussions.

Admiral WOLFE. Yes, sir. We do have those discussions all the time.

Senator KING. Thank you. Senator Fischer.

Senator FISCHER. Thank you, Mr. Chairman.

I don't have any more questions, but I appreciate your answer to Senator Kelly about SLCM-N, and I think it's extremely important that not only do we look at what our adversaries are doing and their comments that they—their public comments that they make that we have to be able to have different options.

I really appreciate the work that that you do on that and to make sure that a president would have options that would only add to the deterrence to make sure we would never have to use them. So, thank you.

Senator KING. I want to conclude the hearing but General Bussiere, you mentioned the new NAOC and a group of us, almost 10 years ago went on one of the NAOC's around the country on a flight with a simulated attack. It was one of the most sobering experiences of my life.

I would urge you to think about inviting Members of the Committee, Members of Congress to take that trip because it takes it

out of the hearing room and becomes much more real as you think about what challenges this country might face, what challenges the President might face in a situation. That was what came through to me was that clock on the wall that told you how long you had to make a decision.

I want to thank you all for the work that you do, it's some of the most important work that this Government is doing. Deterrence is the bedrock of our strategy, and you're on the front line of deterrence. Thank you very much.

I appreciate your testimony. We'll hold the record open for additional thoughts and testimony, and questions from our Members. But for today, thank you so much for joining us. The hearing is adjourned.

[Whereupon, at 5:59 p.m., the Committee adjourned.]

