



# DOCUMENTATION

The following documents present excerpts from recent key testimonies, particularly those relevant to U.S. nuclear policy. A common thread running through them is the seriousness with which U.S. adversaries pursue, advance, and in some cases use new capabilities to achieve their objectives at U.S. and allies' expense.<sup>1</sup> The testimonies also outline some of the steps the United States is planning to take or should be taking to address the challenge.

**Document No. 1. Excerpts from the Statement of Dr. John F. Plumb, Assistant Secretary of Defense for Space Policy before the House Armed Services Committee, Subcommittee on Strategic Forces on Fiscal Year 2024 Strategic Forces Posture, March 8, 2023.**

## INTRODUCTION

Today, the United States finds itself in a highly dynamic and challenging security environment characterized by intensifying strategic competition, assertive behavior by multiple competitors, rapidly evolving domains of conflict, shifting balances of power, and, as a result, a growing risk of military confrontation. Our competitors have placed nuclear weapons, space warfare, and long-range strike at the center of their strategies to coerce and fight the United States and its allies and partners. They are investing heavily in nuclear weapons that can threaten U.S. forces and territory and our allies and partners. Our competitors seek to create a future operating environment in which they can leverage space and strike capabilities to hold at risk our forces, ports, and airfields, and to deny U.S. freedom of maneuver. As recent events make clear, our competitors are developing a range of capabilities to reach the U.S. homeland, ranging from high-altitude balloons for intelligence collection to nuclear-armed hypersonic weapons. Nuclear, space, and missile capabilities also underwrite ongoing efforts by U.S. competitors to gain advantage in "gray zone" competition, undercut U.S. leadership, and reshape global norms to their advantage.

Nuclear weapons, space capabilities, and missile defense are all essential to integrated deterrence. The Department's efforts in these areas undergird all four priorities in the NDS [National Defense Strategy]: (1) defending the homeland; (2) deterring strategic attacks; (3) deterring aggression while preparing to prevail in conflict; and (4) building a resilient Joint Force and defense ecosystem that can sustain U.S. strategic advantage. To ensure we will meet the challenge of the deteriorating security environment, the Department is committed to investing in nuclear triad modernization, homeland and regional missile defense, and a more resilient space architecture.

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<sup>1</sup> The content in this Documentation section has been shortened for presentation.



## SECURITY ENVIRONMENT

### People's Republic of China

The People's Republic of China (PRC) is engaged in a significant and fast-paced expansion, modernization, and diversification of its nuclear forces, which has resulted in the establishment of a nascent nuclear triad. If the PRC continues the current pace of its nuclear force expansion, it could field an arsenal of about 1,500 warheads by 2035. The PRC's intercontinental-range forces are complemented by several theater-range road-mobile ballistic missile systems, and it is developing advanced nuclear delivery systems such as a strategic hypersonic glide vehicle. The PRC is increasing the peacetime readiness of its forces by moving to a launch-on-warning posture. While the end state of the PRC's nuclear force expansion remains uncertain, the trajectory of these efforts points to a large, diverse nuclear arsenal with a high degree of survivability, reliability, and effectiveness, and ever-evolving opaque doctrine. This could provide the PRC with new options before and during a crisis or conflict to leverage nuclear weapons for coercive purposes, including military provocations against U.S. allies and partners in the region. By the 2030s, the United States will, for the first time, face two major nuclear powers as strategic competitors and potential adversaries.

The PRC has dramatically advanced its development of conventional and nuclear-armed ballistic and hypersonic missile technologies and capabilities through intense and focused investment, development, testing, and deployments. In 2021, the PLA Rocket Force (PLARF) launched approximately 135 ballistic missiles for testing and training. This was more than the rest of the world combined, excluding ballistic missile employment in conflict zones. In 2021, the PRC continued building three solid-fueled intercontinental ballistic missile (ICBM) silo fields, which will cumulatively contain at least 300 new ICBM silos. China's deployment of the DF-17 hypersonic glide vehicle (HGV)-armed Medium-Range Ballistic Missile (MRBM) will continue to transform the PLA's missile force. Additionally, the PRC has a robust and redundant integrated air defense system (IADS) architecture over land areas and within 300 nautical miles (345 miles) of its coast that relies on an extensive early warning radar network, fighter aircraft, and a variety of Surface-to-Air Missile (SAM) systems.

### Russia

Russia continues to emphasize nuclear weapons in its strategy while modernizing and expanding its nuclear forces. Russia's nuclear saber-rattling, displayed throughout its unprovoked and indefensible full-scale invasion of Ukraine, is irresponsible and troubling. Russia is steadily expanding and diversifying nuclear systems that pose a direct threat to NATO and neighboring countries. In addition to New START [Strategic Arms Reduction] Treaty-accountable systems, Russia maintains a sizable stockpile of warheads that are not treaty-limited. It continues to pursue several novel nuclear-capable systems designed to hold the U.S. homeland or Allies and partners at risk, some of which are also not accountable

under the New START Treaty. While Russia has not withdrawn from the New START Treaty, its purported suspension of Russia's participation in the New START Treaty is troubling.

Russia is developing, testing, and fielding a suite of nondestructive and destructive counterspace systems to degrade or deny U.S. space-based services as a means of offsetting a perceived U.S. military advantage and deterring the United States from entering a regional conflict. These systems include jamming and cyberspace capabilities, directed energy weapons, on-orbit capabilities, and ground-based DA-ASAT missile capabilities.

Russia has used thousands of air, land, and sea-launched cruise and ballistic missiles, including hypersonic missiles against Ukraine mainly as weapons of terror against, striking vulnerable civilian (non-military) targets, including schools, hospitals, and critical infrastructure. Battlefield usage has reduced Russia's weapons inventories and export controls are hindering its ability to effectively produce modern precision-guided munitions but Russia continues to strike civilian targets in Ukraine. Russia has retained and upgraded its own missile defense system designed to protect Moscow against a U.S. strike, and it has developed several lower-tier air defense systems for its own use and export.

### **Democratic People's Republic of Korea (DPRK)**

The DPRK has ambitions to develop its space program and has placed two satellites in orbit. Under the guise of peaceful use of space, the DPRK applied data from its space program to aid in the development of long-range and multistage ballistic missiles as well as counterspace capabilities, including GPS and SATCOM [global satellite communications] jamming.

The DPRK continues to improve, expand, and diversify its conventional and nuclear missile capabilities, posing an increasing risk to the U.S. homeland and to U.S. forces, allies, and partners in theater. The DPRK recently displayed new, larger ICBMs during a military parade, conducted an ICBM test in February, and conducted a variety of missile tests over the last year including what it claims are hypersonic missiles.

## **NUCLEAR STRATEGY AND POSTURE**

As reflected in the President's forthcoming budget request for Fiscal Year 2024, the administration is committed to full-scope modernization of all three legs of the triad as well as those nuclear capabilities that support regional deterrence. This includes full funding of the SENTINEL ICBM; the COLUMBIA-class submarine (SSBN); the B-21 RAIDER strategic bomber; and the long-range standoff cruise missile. The Department will continue nuclear certification of the F-35A aircraft; fielding of the B61-12 nuclear gravity bomb; and retention of the W76-2 low-yield ballistic missile warhead. The Department will also work to modernize our nuclear command, control, and communications architecture to ensure its effectiveness and resilience in an evolving security environment.

We must prepare for a potential future in which Russia continues to maintain large numbers of warheads on strategic, non-strategic and novel systems, while China continues to expand and modernize its arsenal without constraints.

Non-nuclear capabilities are also essential to deterrence, and a key priority for NDS and NPR [Nuclear Posture Review] implementation is to better synchronize nuclear and non-nuclear planning, exercises, and operations. As an example of this approach, the Department is actively studying the problem of how to hold at risk hard and deeply buried targets by leveraging existing capabilities and taking an all-domain approach to developing an enduring solution to this problem set.

The capability to deter limited nuclear attacks is critical given that some competitors have developed strategies for warfare that may rely on the threat or actual employment of nuclear weapons to terminate a conflict on advantageous terms. Some allies and partners are also particularly vulnerable to attacks with non-nuclear means that could produce devastating effects.

### **Arms Control and Nonproliferation**

The Department is committed to seeking mutual and verifiable nuclear arms control and non-proliferation measures when they can increase our national security interests. However, we cannot ignore the PRC's and Russia's expansions of their nuclear arsenals. Nor can we ignore Russia's unprovoked and unjust aggression against Ukraine, its noncompliance with provisions of the New START Treaty, and its recent announcement of a purported suspension of its treaty obligations. Russia's non-compliance underscores the looming challenges of a world in which the United States confronts two nuclear peer competitors simultaneously. Any future nuclear arms control framework with Russia must also account for the PRC's nuclear expansion.

### **SPACE STRATEGY AND POSTURE**

Our adversaries have seen more than two decades of U.S. military successes enabled by space capabilities. They seek to deny our ability to leverage space, and are developing a range of capabilities to do so. Addressing these threats requires mission assurance of our space capabilities. The foundation of mission assurance is resilience—being able to provide critical space-based services across the Joint Force in competition, crisis, and conflict. Resilience is also the primary way to deny adversaries the benefit of attack. The nascent resilient Missile Warning/Missile Tracking architecture is a good example of the Space Force's pivot to a series of resilient-by-design architectures that will assure the mission while being both more survivable and more capable. This tracking layer will improve U.S. all-domain awareness globally to increase our warning, tracking, and attribution capabilities, especially as it relates to threats like hypersonic glide vehicles. Systems like these will address emerging threats, expand our warning time and senior leader decision space, and enhance our missile defeat capabilities to negate these threats.

One example of how we are strengthening military-to-military ties to our allies is through the Combined Space Operations (CSpO) Initiative, which includes defense leaders from Australia, Canada, France, Germany, New Zealand, the United Kingdom, and the United States. In this forum, we are identifying ways to improve cooperation, coordination, and interoperability to sustain freedom of action in space, optimize resources, enhance mission assurance, and prevent conflict.

### **MISSILE DEFENSE STRATEGY AND POSTURE**

Within the integrated deterrence framework, missile defense weaves together all instruments of national power across warfighting domains, geographic theaters, the spectrum of conflict, and our global network of alliances and partnerships. More specifically, missile defense provides resilience to our deterrence and defense posture; complicates adversary attack planning and reduces an adversary's confidence of success; raises the deterrence threshold for potential conflict; offer[s] assurances to our allies and partners that the United States stands behind its global security commitments; and provides defensive military options that may be less escalatory than employing offensive systems.

One line of effort on our homeland missile defense that I would like to highlight is the Department's commitment to strengthen the defense of Guam through a layered IAMD architecture. As stated in the 2022 MDR, Guam is a part of the United States homeland and any missile attack against it or any other U.S. territory would be met with an appropriate response. As such, the Department requested \$892M in FY23 for this purpose. The Department is also in the process of designating, as required by statute, a single senior official to manage the missile defense effort on Guam.

The Department is also investing in our capacity to sustain extended conflicts. This is most evident in Ukraine where, without missile defense, Russia would have likely achieved air dominance and possibly achieved many of its original objectives months ago. That is why air and missile defense remains Ukraine's top priority.

Missile defense cooperation with our allies and partners is growing rapidly in response to the changed security environment.

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**Document No. 2. Excerpts from the Statement of General Glen VanHerck, United States Air Force Commander, United States Northern Command and North American Aerospace Defense Command before the House Armed Services Committee, Subcommittee on Strategic Forces on Fiscal Year 2024 Strategic Forces Posture, March 8, 2023.**

The successful defense of North America requires the Department of Defense to move beyond outdated assumptions and plans that do not fully reflect competitor capability, capacity, and intent to threaten the homeland. Likewise, continued action is required to build

enduring advantages and outpace the gains made by competitors around the globe. This will require the Department to invest in modernization, implement innovative processes, prioritize our personnel and improve civilian hiring practices, and increase agile decision making at all levels.

## STRATEGIC ENVIRONMENT

Today's strategic environment is the most complicated and potentially dangerous in my 35+ years of service.

### **The People's Republic of China (PRC)**

The PRC remains NORAD and USNORTHCOM's long-term pacing challenge. Beijing continues ambitious military modernization at an alarming pace. It would be naive to think their sprint to develop advanced cyber tools, maritime capabilities, and hypersonic technology has only regional applications, as the PRC continues to develop advanced long-range conventional and strategic capabilities and the infrastructure necessary to project military power at greater distances. Underpinning this growth is a rapid nuclear expansion that is on pace for the PRC to expand their nuclear stockpile from what DoD estimates is over 400 today to about 1,500 by 2035. While less observable, the PRC's aggressive efforts to exploit the information technology sector are accelerating an increasing threat to North America.

The PRC's aggressive actions in the Pacific in mid-2022 following Congressional visits to Taiwan illustrate how regional events create geostrategic ripple effects that can quickly reach our shores. President Xi is likely to use his next term in office to double down on the PRC's revisionist foreign policy, and is likely to include global efforts to undermine the United States and bolster partnerships with U.S. competitors, including Russia. In February 2022, Xi signaled his intent to follow this path when he declared the PRC-Russia friendship would have no limits in a public pronouncement just weeks before Russia's illegal and unprovoked full-scale invasion of Ukraine. The PRC has almost certainly watched the war to draw lessons that will inform its next steps toward Taiwan.

Xi's statement also proved to be more than rhetorical when, in May 2022, the PRC and Russia conducted a combined bomber patrol over the Sea of Japan coinciding with the Quad Leaders' Summit in Tokyo. The May 2022 bomber patrol was followed by a second bomber patrol in November 2022. The cooperation is not confined to the air domain. PRC and Russian naval forces conducted a combined patrol in the fall of 2022 that covered 7,000 nautical miles in the Pacific, included a first-ever combined naval transit of the Aleutian Islands, and came on the heels of Xi sending scores of troops to Russia to participate in Moscow's largest annual military exercise. For years, the PRC has relied on Russian military materiel to build its armed forces, and I am aware of reports that the PRC has transferred materiel with military applications to Russia during Russia's war against Ukraine. These actions are more than symbolic and demonstrate the PRC's growing power projection

capabilities, which will likely encompass the Arctic in the next decade—a region the PRC is eyeing with its self-proclaimed status as a near-Arctic state.

## **Russia**

As USNORTHCOM and NORAD take necessary measures to defend against a growing PRC threat, the commands continue to defend the United States and Canada every day against Russian aggression in all domains. Russia's brazen and unprovoked full-scale invasion of Ukraine in 2022 proved that Russia has the capability and capacity to inflict significant damage to infrastructure and other critical targets with its all-domain long-range strike capabilities. Russia also has a history of conducting clandestine operations in other nations to achieve its political objectives. While Russia has overplayed its hand, suffered significant losses to the heroic Ukrainian defense forces, and inadvertently helped to unify NATO, it has gained real-world combat experience as it enters its second year of the full-scale invasion. The meager performance of Russia's ground forces in Ukraine should not overshadow other capabilities it has showcased in Ukraine, including air- and sea-launched cruise missiles capable of striking North America, cyber activities, and economic coercion. For the first time, we also saw Russia employ its new KILLJOY air-launched hypersonic missile in combat.

Concurrent with its war against Ukraine, Russia has also continued to conduct major military exercises and test developmental capabilities that will compound the threat to North America once fielded. In April 2022, Russia tested the massive SARMAT ICBM, a highly capable strategic weapon that helps reinforce the critical importance of a modern and reliable U.S. strategic deterrent. Meanwhile, Russia is testing its special mission Belgorod nuclear submarine, a modern platform capable of carrying the nuclear-capable Poseidon torpedo, designed to hold the homeland at risk by striking coastal targets from thousands of miles away.

The test of the Belgorod followed Russia's Arctic military exercise that included live-fire cruise missile launches designed to test Moscow's readiness for a conflict in the high north. Last fall, Russia added its first SEVERODVINSK-class conventional and nuclear capable cruise missile submarine to the Pacific Fleet, which poses a new challenge to our defense of the western approaches to North America. In October 2022, in the midst of elevated international tensions stemming from Russian threats to escalate its already brutal campaign in Ukraine, Russia chose to proceed with its annual strategic forces exercise, including demonstrations of multiple nuclear strike capabilities. Finally, in January 2023, a Russian GORSHKOV-class frigate transited the western Atlantic while armed with Tsirkon hypersonic cruise missiles.

I believe it would be shortsighted to view Russia's war against Ukraine as a limited regional crisis. Russia's actions increase the very real risk of miscalculation and the conflict's expansion beyond its current boundaries—scenarios that could rapidly increase the risks to North America and continental defense. If Russia should seek to compel allies to reconsider their support for Ukraine through escalatory actions or follow through with the desperate threats to use nuclear weapons in Ukraine, the risks to the Homeland would increase.

## **DPRK and Iran**

The Democratic Peoples' Republic of Korea (DPRK) tested at least 65 conventional theater and long-range nuclear capabilities over the last year. That number includes the first tests of a new larger, longer range, and more capable ICBM, adding another missile that can likely reach the entire homeland and one the regime claims is capable of carrying a hypersonic glide vehicle payload. The DPRK tested more missiles in 2022 than any time in its history, showing that the regime will continue to prioritize military capabilities at the expense of needed food and pandemic relief for its people. Public reports of renewed nuclear test preparations further highlight the grave danger this regime poses to regional and global stability. We must remain ready for multiple contingencies and potential crisis on the Korean Peninsula.

The DPRK's reckless pursuit of advanced nuclear capabilities and robust ballistic missile research, development, and testing threatens regional stability, our allies and partners, and potentially the homeland.

Iran has not shied away from pursuing malign global activities, including in North America; the regime continues to pose a significant threat to the United States, as well as our partners in the Central Command region. The August 2022 disclosure of an Iranian plot to assassinate a former senior U.S. official on U.S. territory illustrated the brazenness of the Iranian government. The regime's decision to provide Russia with unmanned loitering munitions used to attack civilian infrastructure in Ukraine provides further evidence of Iran's embrace of destabilizing activity. A future decision by the regime to pursue an ICBM-class missile would add yet another threat vector capable of striking North America.

## **Where We Are Today: 20 Years of USNORTHCOM and 65 Years of NORAD**

Multiple peer competitors and rogue states possess the capability and capacity to threaten our citizens, critical infrastructure, and vital institutions. These competitors possess, or are developing, the modern capabilities that limit the time and options available to decision makers responsible for defending our interests. In addition to destructive kinetic and cyber capabilities, malign actors actively exploit our democratic society by spreading disinformation that drives wedges between our citizens, undermines democracy, and weakens our alliances.

In crisis or conflict, potential adversaries will likely seek to interfere with the Department's ability to project power abroad. Disruptions of military and civilian transportation infrastructure in North America could impede the ability of the United States and Canada to project combat power. Today I assess, as I have for nearly three years, that homeland defense is a potential limiting factor to ensuring rapid and effective implementation and execution of global contingency plans. This is due to my lack of domain awareness, limited timely access to forces that are ready to operate throughout my areas of responsibility, including the Arctic, and a lack of resilient infrastructure enabling the Joint Force to fight in and from the homeland while ensuring forward power projection.



Russia has restored its capability to threaten North America with modernized bombers, surface ships, and submarines armed with long-range, highly precise nuclear and conventional cruise missiles. The PRC is making rapid progress in developing similar capabilities, which will further complicate NORAD's warning missions and affect national strategic decision making.

It is clear that our competitors possess long-range strike capabilities that could be used to attack the United States and Canada from outside the detection range of legacy sensors.

### **USNORTHCOM and NORAD Priorities**

As competitors and potential adversaries continue to field advanced all-domain capabilities with the potential to create significant effects in the homeland, it is imperative that the United States and Canada move quickly to improve domain awareness from the seafloor to space and cyberspace for all approaches to North America.

U.S. Space Force investments in advanced space-based missile warning sensor capabilities show great promise with particular regard to hypersonic and advanced missile threats. These future systems will detect, track, and identify threats, including hypersonic threats, enable better warning and assessment, and develop actionable targeting solutions, at a much faster pace than we currently experience, while also delivering an inherent operational resilience. Given our competitors' advanced maritime domain capabilities, I fully support the Navy's investment in a modernized Integrated Undersea Surveillance System. These capabilities, in turn, will directly correlate to more time and options available to produce a favorable outcome for the United States and Canada.

In addition to the investment in OTHR, NORAD and USNORTHCOM have also demonstrated the potential for linking existing platforms and sharing data with multiple commands, interagency and international partners. By sharing data previously trapped in bureaucratic and organizational stovepipes through innovative programs like Pathfinder, Northstar, and the Global Information Dominance Experiments (GIDE), USNORTHCOM and NORAD have proven that it is possible to rapidly improve domain awareness and streamline global information sharing without the costs associated with fielding exquisite new capabilities. It is crucial that the Department of Defense and the Services, as well as the Canadian Department of National Defence, continue the work to unlock the remarkable potential of these initiatives.

The feasibility of every other Geographic Combatant Command's plans will require active campaigning in and from North America, and successful defense of the homeland is necessary to deter adversaries and assure allies and partners. Therefore, I have also directed that USNORTHCOM and NORAD prioritize homeland defense campaigning to demonstrate our readiness, capabilities, and resiliency. I am also operationalizing the commands to accelerate the flow of information from sensor to decision maker. Our competitors and potential adversaries have shown that they will hold the homeland at risk in a conflict, and USNORTHCOM and NORAD are acting today to ensure homeland defense plans are understood, exercised, and resourced.

At present, I am concerned for the commands' ability to execute assigned missions—including contingency and operations plans in support of homeland defense. I am limited by a lack of timely access to forces that are organized, trained, and equipped to operate throughout the NORAD area of operations and the NORTHCOM area of responsibility, as well as by insufficient supporting infrastructure.

## **Conclusion**

The one constant throughout my time in command has been the extraordinary pace at which our competitors have advanced their capabilities to threaten the homeland. Despite those clear risks, the processes used by the Department of Defense and the Canadian Department of National Defence for planning, acquisitions, personnel hiring, technology development, and other activities necessary to the success of the defense enterprise remain largely unchanged from when I received my commission nearly 36 years ago.

As competitors develop greater capability, capacity, and intent to challenge the United States, Canada, and the rules-based international order, I believe that the greatest strategic risk for the United States stems from our own inability to adapt at a pace required by the changing strategic environment. In an era of incredible innovation and technological achievement, inflexible, outdated processes are a greater impediment to success than many of our competitors' capability advancements. We cannot continue to rely on Industrial Age practices and legacy platforms to compete in a digital age, and if we fail to evolve at the pace demanded by the strategic environment, our competitive advantage will continue to erode.

The Department and Congress must also be more willing to accept the relatively low risks associated with retiring legacy platforms in order to ensure our ability to fight and win against advanced and well-resourced competitors. Over the last decade, the PRC and Russia have made extraordinary technological advancements while the Department remains encumbered by obsolete capabilities and associated costs. To defend the homeland, USNORTHCOM and NORAD require a modern force with the capacity and capability to deter and if required defeat advanced peer competitors. Retiring systems that have exceeded their operational lifespans—to include fighters and command and control platforms at the end of their service lives—is necessary to accelerate the arrival of next generation capabilities.

The PRC and Russia have already fielded highly advanced hypersonic capabilities, while the United States' hypersonic program, although accelerating, still languishes well behind our competitors' efforts. Further, DoD faces operational challenges with civilian hiring processes for recruiting and hiring the innovative and experientially diverse workforce needed to drive innovation and advancement on pace with the civilian tech sector. Simply put, the Department must continue to strategically tackle hiring and personnel management improvements to move its workforce goal of being an employer of choice forward.

Finally, the PRC high altitude balloon (HAB) incursion into our national airspace was obviously a significant event that shined a light on the PRC's brazen intelligence collection against the United States and Canada. It was the first time USNORTHCOM conducted an engagement over the United States in our history, and it made it clear that our competitors

have the capability and intent to reach the homeland. The three Unidentified Aerial Phenomena (UAPs), also shot down days later by USNORTHCOM and NORAD, clearly demonstrated the challenges associated with detecting and identifying unmanned objects in U.S. airspace. As for NORAD and NORTHCOM, I commit to you that this event has already generated critical lessons learned for my commands and our mission partners, and I can guarantee that NORTHCOM and NORAD are going to continue to learn from it and do whatever is necessary to keep our country safe.

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**Document No. 3. Excerpts from the Statement of General James H. Dickinson, Commander, United States Space Command before the House Armed Services Committee, Subcommittee on Strategic Forces on Fiscal Year 2024 Strategic Forces Posture, March 8, 2023.**

U.S. adversaries are developing, testing, demonstrating, and fielding a wide range of counterspace capabilities to degrade or deny the ability for the U.S. military to leverage critical space-based services. As of this year there are 8,225 satellites in low Earth orbit and nearly 1,000 satellites in geosynchronous Earth orbit (GEO).

### **CHALLENGES IN SPACE**

Challenges to a safe, secure, stable, and sustainable space domain are increasing. Both the People's Republic of China (PRC) and the Russian Federation are fielding capabilities that aim to hold U.S., Allied, and partner space assets at risk. North Korea and Iran are in the early stages of developing their space enterprise.

The PRC conducted the first fractional orbital launch of an ICBM with a hypersonic glide vehicle in mid-2021. This system could enable the PRC to rapidly launch weapons that challenge missile warning and missile defense architectures.

Russia's 15 November 2021 destructive anti-satellite (ASAT) missile test and its subsequent acts in connection with its further invasion of Ukraine threaten to foreshadow the future of warfare and national security. [...] Russian interference with space-based capabilities during its invasion of Ukraine and continued threats to carry out "retaliation" against commercial satellite infrastructure demonstrate a willingness to employ counterspace capabilities to gain military advantage. Russia's cyber attacks in late February 2022 against commercial satellite communications networks to disrupt Ukrainian command and control during the invasion and spillover impacts into other European countries - highlighted an important nexus between government and private sector equities in space.

These events exemplify the PRC and Russian commitment to fielding diverse counterspace capabilities across multiple domains including cyberspace, electronic warfare, directed energy, anti-satellite missiles, and potentially even space-to-ground weapons.

Current PRC and Russian counterspace capabilities range from temporarily deceiving, disrupting, or denying space services, to permanently degrading or destroying space-based capabilities. All are designed to deter U.S. response to conflict or crisis and ultimately diminish U.S. influence and military effectiveness.

### **The Pacing Challenge—The People’s Republic of China**

President Xi views space power as a key to “great power status” and a cornerstone of the PRC’s economic, political, and military ambitions. China expects its future wars to be fought mostly outside its borders and in the maritime domain. PLA strategy emphasizes the role spacebased systems will play in such conflicts. Chinese military doctrine states that space power is the essential “glue” that holds together air, sea, and land control and that “the dominance of space has been inseparable from the outcome of war.”

The PRC continues to strengthen its military space capabilities, investing in space-based intelligence, surveillance, and reconnaissance (ISR), satellite communication, and navigation. It is also improving satellite meteorology, human spaceflight, and robotic space exploration.

The PRC employs a robust space-based ISR capability designed to enhance its worldwide situational awareness. Its ISR satellites provide electro-optical and synthetic aperture radar imagery as well as signals intelligence data. They are used for military and civilian remote sensing and mapping, terrestrial and maritime surveillance, and intelligence collection. The PLA owns and operates about half of the world’s space-based ISR systems. These capabilities support the PLA’s ability to monitor, track, and target U.S. and allied forces worldwide.

Today, China can hold U.S., Allied, and Partner assets at risk in all orbits. The PLA is specifically pursuing capabilities to counter U.S. space assets to achieve space superiority and enable PLA freedom of maneuver. Chinese military academics advocate for defeating adversaries’ PNT, electronic warfare (EW), and ISR to “blind and deafen the enemy.” The PLA has an operational ground-based ASAT missile for low Earth orbit satellites, and is pursuing additional anti-satellite weapons capable of destroying satellites up to GEO. The PLA has also tested hypersonic glide vehicles aimed at defeating traditional missile warning systems and ballistic missile defenses.

The PRC developed the Shenlong and Tengyun spaceplanes to explore reusable technology with enhanced maneuverability. The initial prototype, launched in 2020, stayed in orbit for two days before returning to Earth. A second Shenlong, launched in August 2022, remains on orbit today. Payloads on operational versions of these spaceplanes could provide enhanced space services that the PLA could integrate into its weapons and C2 systems to erode the information advantage of the United States and our Allies.

China launched its SJ-21 satellite on 24 October 2021 and reported in open press that its mission was “to test and verify space debris mitigation technologies.” On 22 January 2022, SJ-21 rendezvoused with a defunct and fuel-depleted BeiDou satellite. By 26 January, SJ-21 had captured the defunct satellite and pulled it several hundred miles into a higher graveyard orbit. The SJ-21 subsequently released the defunct BeiDou satellite and returned

to geosynchronous orbit. While removing a defunct satellite to graveyard orbit may be innocuous, the SJ-21 could clearly serve in a counterspace role and hold our geosynchronous satellites at risk.

### **Russian Use of Space and Counterspace**

Russia's use of space and counterspace capabilities during the Ukraine conflict validates the Department of Defense's (DoD) long-held understanding of Russian doctrine. Russian space capabilities have supported Russian military ground operations and enabled deep precision strikes against Ukrainian infrastructure. Media reported on Russian jamming of radar observation sites and navigation signals (including GPS) serving the region, as well as cyberattacks on Ukrainian and European space-enabled communications.

Russia has developed a suite of counterspace capabilities including EW and directed energy weapons to deny, degrade, disrupt, destroy, and deceive communications, navigation, and space-based ISR. Its directed energy weapons include several ground-based, low-power lasers intended to blind satellites temporarily, and high-power lasers developed to damage other U.S. satellites permanently.

Russian cyber attacks in late February 2022 disabled very small aperture terminals in Ukraine and across Europe. This included tens of thousands of terminals outside of Ukraine that, among other things, support wind turbines and provide internet services to private citizens.

### **PRC-Russia Cooperation**

PRC and Russian cooperation on defense matters has increased in recent years. The PLA participated in Vostok last year – Russia's annual strategic forces exercise. Beijing has provided Moscow political and economic support throughout the full-scale invasion of Ukraine that began last year. In February 2022, the two countries announced 16 agreements including one to increase the interoperability of their respective nations' global navigation satellite systems. The new accord will align timing standards of China's BeiDou constellation and the Russian GLONASS architecture. A fully integrated system will provide greater precision, resiliency, and allow for more efficient allocation of service.

Russia possesses deep, decades long, expertise in space operations. Recently, however, its progress has been hampered by shortfalls in funding, a lack of qualified personnel, and other resource inadequacies. Dramatically reduced access to key electronic components from long standing international sanctions has negatively impacted Russia's aerospace industry.

Meanwhile, the PRC has committed considerable economic and technological resources to growing all aspects of its space program. It is operating a space station and is taking on a greater role in lunar and deep space exploration. In 2021, Moscow and Beijing agreed to an International Lunar Research Station and the PRC may attempt to conduct its first crewed landing on the surface of the Moon before 2030.

## North Korean and Iranian Developments

North Korea has demonstrated non-kinetic counterspace capabilities including GPS and satellite communication (SATCOM) jamming. It likely intends to deny space-based navigation and communications during conflict. North Korea seeks to develop its space capabilities and has placed two satellites in orbit. North Korea's space program has provided it with data applicable to its long-range and multi-stage ballistic missile programs. Additionally, North Korea conducted a record number of missile launches last year including intercontinental and submarine-launched ballistic missiles and has continued these activities in 2023.

Iran demonstrated a growing commitment to space with the launch of the Khayyam sensing satellite. This system, developed cooperatively by Iran and Russia, was launched by Russia on behalf of the Iranian government. Similar to North Korea, Iran could apply data from its space program to further the development of long-range missiles.

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**Document No. 4. Excerpts from the Statement of General Anthony J. Cotton, Commander, United States Strategic Command before the House Armed Services Committee, Subcommittee on Strategic Forces on Fiscal Year 2024 Strategic Forces Posture, March 8, 2023.**

### GLOBAL SECURITY ENVIRONMENT

For the first time in our country's history, the United States faces two major nuclear powers, the PRC and the Russian Federation, which have the capability to employ nuclear coercion as a way to achieve their national objectives. Russia presents a growing nuclear deterrence challenge centered on its potential perception that the threshold for regional nuclear employment is lower with low-yield systems. The PRC is also developing capabilities that would present a similar deterrence challenge, and it is unconstrained by any nuclear arms control treaty limitations. Additionally, the activities of the Democratic People's Republic of Korea (DPRK) are regionally destabilizing and have global implications.

In the longer term, emerging technologies—including HSWs [hypersonic weapons], fractional orbital bombardment (FOB) capabilities, anti-satellite capabilities, artificial intelligence (AI), autonomous systems, advanced computing, quantum information sciences, biotechnology, and advanced materials and manufacturing—pose a growing challenge to our national defense. Meeting these near-term and longer-term threats requires a globally focused national strategy and commitment that spans decades.

## **People's Republic of China**

The PRC's rapid qualitative and quantitative expansion of military capabilities enables a shift in its strategy and requires the Department of Defense (DoD) to make immediate and significant alterations to plans and capabilities. The PRC is aggressively pursuing their global ambitions through a national strategy of "Military-Civil Fusion"—a comprehensive focus on advancing civilian research to develop and then apply new technologies towards military and defense innovations.

Correspondingly, the PRC seeks to match, or in some areas surpass, quantitative and qualitative parity with the United States in terms of nuclear weapons. The PRC's nuclear capabilities already exceed those needed for its long-professed policy of "minimum deterrence," but PRC capabilities continue to grow at an alarming rate. Additionally, the PRC is making substantial investments to expand its inventory of land-, sea-, and air-based nuclear delivery platforms and is constructing the infrastructure necessary to support the significant expansion of its nuclear forces. Notably, the PRC is developing capabilities inconsistent with its historical minimum deterrence posture.

Within the past three years, the PRC has built hundreds of new ICBM silos, further indicating a move away from a minimum deterrence posture. The PRC's three new missile fields collectively provide it with more than 300 silos. Each of these silos can be equipped with the CSS-10 Mod 2 ICBM, which is capable of ranging the continental United States (CONUS) with multiple independently targetable reentry vehicles (MIRVs). Additionally, the PRC maintains other ICBMs, some of which are road-mobile. Unconstrained by arms control treaty limitations, the PRC is fielding a new generation of mobile missiles, with MIRV and penetration aid capabilities. The PRC's most modern road-mobile and MIRV-capable ICBM advanced from concept to deployed system in only a few years. The PRC is now projected to have over 1,000 warheads by the end of this decade. In accordance with statutory requirements, I recently reported to Congress that the number of land-based fixed and mobile ICBM launchers in the PRC now exceeds the number of ICBM launchers in the U.S.

Just like the ground leg, the air and sea legs of the PRC's nuclear triad are now armed with newly developed weapon systems. The air-refuelable H-6N bomber is armed with new nuclear-capable cruise missiles and air-launched ballistic missiles that may be nuclear capable, and the PRC is building a new stealth strategic bomber with global reach. The PRC's six JIN class ballistic missile submarines (SSBNs) are now being equipped with the new third-generation JL-3 SLBM capable of ranging CONUS. PRC strategists also highlight their country's perceived need for lower-yield nuclear weapons. Significantly, the PRC's investment in lower-yield, precision systems with theater ranges points to investment in asymmetric capabilities that could be employed coercively during an escalation crisis, similar to Russia's irresponsible nuclear saber-rattling during its war against Ukraine. This presents the U.S. with a deterrence challenge that must be addressed with a range of U.S. capabilities, both conventional and nuclear. The PRC currently has an arsenal of approximately 1,000 medium- and intermediate-range ballistic missiles, many of which are

dual capable (i.e., able to be armed by either conventional or nuclear warheads) and able to inflict significant damage to U.S., Allied, and partner forces in the Indo-Pacific.

The trajectory of the PRC's nuclear advancements points to a large, diverse nuclear arsenal with a first-strike offensive capability and a high degree of survivability, reliability, and effectiveness. When considered in the context of its heavy investment in NC3, as well as increased readiness, the PRC's nuclear modernization highlights emergent capabilities that could provide it with a spectrum of first-strike offensive options before and during a crisis or conventional conflict. The PRC may believe that nuclear weapons represent a key component of its counter-intervention strategy and could use these weapons coercively against our Nation, Allies, or partners.

### **Russian Federation**

Russia's brutal invasion of Ukraine is a violent attempt at territorial seizure that aims to undermine the rules-based international order with conventional force backed by nuclear coercion. Russia's nuclear rhetoric is underpinned by its nuclear arsenal, which is the largest and most diverse in the world. Russia continues to flight test its new heavy ICBM, the SS-X-29 Sarmat, with plans to begin fielding it in 2023 and eventually replace the legacy SS-18 heavy ICBM. With Sarmat, Russia joins the PRC in developing ICBMs that use at least partial orbital trajectories. Russia also continues to field new DOLGORUKIY-class SSBNs, armed with the new SS-N-32 Bulava SLBM, and SEVERODVINSK-class nuclear-powered cruise missile submarines.

Russia's significant investment in launch platforms and systems not subject to the New START Treaty (NST) provides it with increasingly diverse and flexible nuclear deterrence options. Russia now fields nuclear-capable hypersonic systems such as the Avangard HGV, the Tsirkon land-attack cruise missile, and the Kinzhal air-launched ballistic missile, the last of which Russia has employed in Ukraine with conventional warheads. Russia also has a stockpile of approximately 2,000 theater nuclear weapons that does not fall under the limits established by the NST.

The continued degradation of Russian conventional capability in Ukraine will likely increase Russia's reliance on its nuclear arsenal. This phenomenon, along with the PRC's rapid breakout and development of capabilities that present a similar deterrence challenge, underscores the increased perceived utility of nuclear weapons in the contemporary environment.

## **INTEGRATED DETERRENCE**

The war in Ukraine, combined with the PRC's rapid nuclear arsenal expansion and the DPRK's growing nuclear capabilities, will likely make longstanding U.S. nonproliferation goals more challenging. For 70 years, U.S. extended deterrence commitments have functioned as one of the most important factors limiting the proliferation of nuclear weapons. In the current environment, the credibility of U.S. extended deterrence



commitments is even more vital to nuclear nonproliferation goals. Critically, there must be no perception of a threshold below which an adversary may believe it could employ nuclear weapons, such as non-treaty accountable, lower-yield, theater weapons, to obtain a benefit.

## **WHAT USSTRATCOM NEEDS TO ACCOMPLISH ITS MISSION**

It is essential to sustain our current platforms until new systems are at full operational capability. Correspondingly, we are coordinating with the Services on efforts to mitigate operational impacts should delays occur in the delivery timeline for new capabilities.

### **Nuclear Command, Control, and Communications (NC3)**

#### ***C3 Next Generation / Modernization***

In the next five years, we will transition from Milstar to the Advanced Extremely High Frequency satellite constellation, gaining greater capacity, survivable worldwide NC3 reach, and the ability to provide direction to our forces in degraded environments. Our national leadership conferencing, currently using a voice-only legacy technology, will transition to voice and video displays. In our warning layer, we are moving away from the Defense Support Program and towards the Space Based Infrared System to maximize warning time. Efforts are already underway on our submarines, E-6B aircraft, and bombers to replace previous generation radios with improved systems that are more resilient to jamming and other electromagnetic effects.

In the next ten years, the launch and use of Next Generation Overhead Persistent Infrared geosynchronous and polar satellites will replace legacy systems with a space-based missile warning constellation to detect and track threats around the globe. The Space Development Agency's Proliferated Warfighting Space Architecture is aimed at building a constellation of satellites in low and medium earth orbit that can monitor maneuvering hypersonic missiles flying below the range of today's ballistic missile detection satellites and above the radar of terminal-phase targeting systems. These satellites will complement other efforts to detect and track maneuvering hypersonic missiles that are difficult targets for current missile warning capabilities. Finally, we will use polar satellite communications capability with the Enhanced Polar System Recapitalization program to provide message relay. Our submarines, E-6B aircraft, bombers, and missile fields will receive communication systems that increase survivability of weapon systems in a crisis situation. We are focused on achieving our vision—a modernized NC3 enterprise that remains resilient, reliable, and available at all times and under the worst conditions.

#### ***E-4B Nightwatch***

The E-4B Nightwatch aircraft serves as the National Airborne Operations Center and is a key component of the National Military Command System for the President, Secretary of Defense,

and Joint Chiefs of Staff. The E-4B recapitalization program—the Survivable Airborne Operations Center—will serve as the next generation airborne command center platform. In case of national emergency or destruction of ground command and control centers, the aircraft provides a highly survivable command, control and communications center to direct U.S. forces, execute emergency war orders and coordinate actions by civil authorities. For these reasons, we must continue to develop and deliver this platform on time to prevent any capability gaps associated with this important national asset.

### ***E-6B Mercury***

The E-6B Mercury accomplishes two missions: Emergency Action Message (EAM) relay to all legs of the nuclear triad (Take Charge and Move Out/TACAMO) and an alternate USSTRATCOM command center providing EAM origination and ICBM secondary launch capability (Looking Glass). E-XX is the follow-on platform to the E-6B airframe and will execute the TACAMO mission only. In coordination with the Office of the Undersecretary of Defense for Acquisition and Sustainment and the Joint Staff, USSTRATCOM and the NC3 Enterprise Center are conducting an evaluation of alternatives (EoA) to consider all missions and platforms to deliver the Looking Glass capabilities currently performed by the E-6B. Recommendations from the EoA should be available by mid-summer. We must complete recapitalization by the E-6B's projected end of service life in FY38.

### **Land-Based Triad Component**

The ICBM remains our country's most responsive option for strategic deterrence. The Minuteman III (MMIII) force provides a responsive, highly reliable deterrent capability, supported by a secure command and control system. Geographically dispersed ICBMs deny potential adversaries the possibility of a successful first strike.

MMIII's weapon system replacement, the LGM-35A Sentinel ICBM, will deliver MMIII's key attributes while enhancing platform security, streamlining maintenance processes, and delivering greater operational capability needed for the evolving threat environment. Sentinel's program scope and scale cannot be overstated—our first fully integrated ICBM platform includes the flight system, weapon system, C2, ground launch systems, and facilities. The Sentinel program is pursuing mature, low-risk technologies, design modularity, and an open system architecture using state-of-the-art model-based systems engineering. Sentinel will meet our current needs, while allowing affordable future technology insertion to address emerging threats. [...] Sentinel will deploy with numerous advantages over MMIII and will provide a credible deterrent late into this century.

### **Sea-Based Triad Component**

The Navy's OHIO-class SSBN fleet, equipped with the Trident II D5 SLBM, patrols the world's oceans undetected, providing an assured second strike capability in any scenario. Our SSBN

fleet continues to provide a resilient, reliable, and survivable deterrent. However, the life of the OHIO-class SSBN fleet has been extended from a planned 30 years to an unprecedented 42 years. The average age of the SSBN fleet is now 32 years. As the hulls continue to age, the OHIO-class will face sustainment and readiness challenges until it is replaced by the COLUMBIA-class. Similar to Minuteman III, we must maintain OHIO-class hulls until the COLUMBIA is available. The Navy has already invested in the Integrated Enterprise Plan to shorten construction timelines for COLUMBIA hulls two through twelve to meet USSTRATCOM at-sea requirements. Continued investment in revitalizing our shipbuilding industry is a national security imperative.

The first COLUMBIA-class submarine must achieve its initial strategic deterrent patrol in FY31 with an initial loadout of D5 LE missiles and a steady transition to the D5 LE2. The program of record delivers at least twelve SSBNs—the absolute minimum required to meet sustainment requirements. A life-of-hull reactor and shorter planned major maintenance periods are intended to deliver greater operational availability. COLUMBIA will deliver improved tactical and sonar systems, electric propulsion drive, and advanced hull coating to maintain U.S. undersea dominance.

The Trident II D5 LE2 program will field a modern, reliable, flexible, and effective missile capable of adapting to emerging threats and is required to meet COLUMBIA-class SLBM loadout requirements. Stable funding for D5LE2 is vital to maintaining program benchmarks and ensuring a viable SSBN deterrent through the 2080s. COLUMBIA's ultimate success depends on a missile that is both capable and flexible.

Additionally, shore infrastructure readiness is fundamental to supporting current OHIO-class SSBN and future COLUMBIA-class SSBN operations. Provision of military construction and operation & maintenance funding facilitates the Navy's modernization of shore infrastructure supporting the nuclear deterrence mission. One immediate example is the modernization and expansion of the SSBN training and maintenance facilities in Kings Bay. These facilities are critical for maximizing the combat readiness of SSBNs and their crews daily, requiring a commitment to multiple years of funding.

### ***Anti-Submarine Warfare***

Anti-submarine warfare threats continue to evolve. The Navy's Integrated Undersea Surveillance System (IUSS) provides vital information concerning adversary submarine and surface ship operations, enabling U.S. forces to maintain favorable tactical and strategic positions while supporting deterrent patrol operations. Surveillance performed by IUSS also provides the theater undersea warfare commander situational awareness required for maritime defense of the homeland. Advances in adversary submarine stealth underscore the importance of IUSS recapitalization.

Our submarines are formidable weapon systems; however, we must address potential adversaries' anti-submarine warfare advances to maintain an effective and viable SSBN fleet well into the future. Adversary investments in submarine quieting, acoustic arrays, and processing capabilities may challenge our acoustic superiority in the future and

consequently, SSBN survivability. Development and employment of advanced sonar sensors, advanced materials science and coatings, and other efforts within the Navy's Acoustic Superiority Program are vital to maintain our undersea advantage.

### **Air-Based Triad Component**

The bomber fleet is our most flexible and visible leg of the triad. We are the only country with the capability to provide long-range bombers in support of our Allies and partners, enabling the U.S. to signal resolve while providing a flexible option to de-escalate a conflict or crisis. In a force employment model known as the Bomber Task Force (BTF), USSTRATCOM supports global deterrence and assurance objectives. BTFs allow dynamic employment of the Joint Force and clear messaging as potential adversaries watch these missions closely. As bombers conduct missions throughout the globe, they enhance national objectives by demonstrating unity with Allies and partners, and testing interoperability. As a complement to the Air Force's Agile Combat Employment (ACE) concept, we must consider increasing forward-based maintenance capability to support persistent, episodic global presence while retaining the ability to increase nuclear readiness posture as needed. As we sustain legacy systems and field new capabilities, it will be important to invest in bomber support forces and infrastructure to adequately sustain flexibility and effective nuclear deterrence posture.

### ***B-52H Sustainment***

The B-52H continues on as the workhorse of our bomber fleet. The B-52's longevity is a testament to its engineers and maintenance professionals, but it must be modernized to remain in service into the 2050s. Essential B-52 upgrades include the Commercial Engine Replacement Program (CERP), Radar Modernization Plan, global positioning system military code signal integration, and survivable NC3 communications equipment. These improvements will keep the B-52 flying and able to pace the evolving threat. CERP will replace the B-52's 1960s-era TF-33 engines, which will enable longer unrefueled range, reduce emissions, and address supply chain issues afflicting the legacy engines. The B-52's very low frequency and advanced extremely high frequency modernization programs will provide mission critical, beyond-line-of-sight connectivity.

### ***B-2 Sustainment***

The B-2 fleet remains the world's only low-observable bomber, able to penetrate denied environments while employing a wide variety of munitions against high-value strategic targets. The DoD must protect this unique operational advantage as the Air Force transitions from the B-2 to the B-21 fleet. Successful transition requires full funding for B-2 sustainment and modernization programs until the B-21 completes development and certification for

both conventional and nuclear missions, and is fielded in sufficient numbers to preclude any capability gap.

### ***B-21***

The B-21 Raider will provide both a conventional and nuclear-capable bomber supporting the triad with strategic and operational flexibility across a wide range of military objectives. The program is on track to meet USSTRATCOM operational requirements, and continues to successfully execute within cost, schedule, and performance goals. The B-21 will be the backbone of our future bomber force, providing a penetrating platform with the range, access, and payload to go anywhere needed in the world. Consistent funding of the Air Force's B-21 program is required to prevent operational shortfalls in the bomber force and ensure delivery of this critical combat capability.

### ***Air-Delivered Weapons***

The air-delivered weapons portfolio consists of the ALCM, the B83-1 gravity bomb, and the B61 family of weapons, providing a mix of standoff and direct attack munitions to meet near term operational requirements. The ALCM provides current stand-off capability to the strategic bomber force, but is reaching its end-of-life. LRSO will replace the ALCM as our country's sole air-delivered standoff nuclear capability. It will provide the President with flexible and scalable options, and is capable of penetrating and surviving against advanced air defenses—a key attribute and important component in USSTRATCOM operational plans. The LRSO is complementary to the ICBM and SSBN recapitalization programs and an important contribution to strategic stability. The B61-12 will soon replace most previous versions of the B61, providing a modernized weapon with greater accuracy and increased flexibility. Finally, USSTRATCOM is actively supporting the National Defense Authorization Act requirement to conduct a study on options to hold at risk hard and deeply buried targets.

### ***Tanker Support***

A robust tanker fleet is essential to sustaining global reach for all USSTRATCOM missions. The 65 year-old KC-135 is the backbone of the Air Force's air refueling force but is facing increasing maintenance and sustainment issues. Limited air-refueling aircraft increases bomber response timing and constrains bomber deterrence posture agility. Concurrent mission demands between strategic, theater, and homeland defense require continued tanker modernization and expansion efforts. [...] A conflict with a peer adversary would put previously unseen demands on the tanker force.

## **Weapons Infrastructure and Nuclear Security Enterprise (NSE)**

Stockpile and infrastructure modernization must ensure our systems are capable of pacing and negating adversary threats to our Nation, Allies, and partners. Over the past five years we have made significant investments in the NSE, but most programs take a decade or longer to field a meaningful capability.

There are many NSE programs with just-in-time schedules or that are late-to-need, including pit production, uranium processing, and radiation case manufacturing. Failure to execute and deliver timely NSE modernization programs results in accumulation of operational risk by requiring the retention of aging weapons and components in the stockpile decades longer than intended. [...] Some areas—for example, the W93, B61-12, and W88 Alt 370—saw progress, while others such as the W80-4 and W87-1 stockpile modernization programs are experiencing milestone delays and increased schedule risk.

Production of essential components is a critical issue. [...] It is also vital that the NSE re-establishes a plutonium pit manufacturing capability of no less than 80 pits per year as close to 2030 as possible. Weapon production is a multi-decade task that must address current enterprise limitations as we simultaneously modernize the stockpile, infrastructure, and platforms while sustaining the current force until it can be replaced.

For over a decade, our adversaries have dedicated significant resources to modernizing and expanding their nuclear capabilities.

### **Nuclear Security**

#### ***MH-139A Grey Wolf Replacement Helicopter***

The Joint Force achieved a significant ICBM security milestone with the Air Force's award of a contract to replace the UH-1N helicopter fleet with the new MH-139A "Grey Wolf." The MH-139A offers enhanced speed, range, endurance, payload, and survivability versus the UH-1N. We will continue to work with the Services to deliver this capability.

#### ***Countering Small Unmanned Systems***

The rapid proliferation and growing technological sophistication of small unmanned systems is an increasing threat to the nuclear enterprise. To counter the threat, the Department continues to field Counter-small Unmanned Aircraft Systems (C-sUAS) capabilities and is refining tactics, techniques, and procedures. Similarly, the advancement of unmanned surface and underwater vehicles may soon emerge as a threat to our SSBNs and supporting infrastructure, requiring a comprehensive force protection system to defend both pier-side and in-transit SSBNs.

### **Weapon Generation Facility (WGF)**

As we modernize nuclear weapons and platforms, the Air Force will replace aging weapon storage areas with new WGFs which are vital to security, sustainment, and fielding of the Sentinel, B-21, and LRSO triad modernization programs, and their associated weapons. The Air Force will conduct weapon maintenance, storage operations, and (as required) weapons generation activities in a single reinforced WGF facility at each strategic base. This will further increase security, recapitalize aging infrastructure, and enhance efficiency throughout the mission. The WGFs are a critical part of the larger nuclear modernization effort and must be fully funded to deliver on time in support of each program of record delivery schedule.

### **Joint Electromagnetic Spectrum Operations (JEMSO)**

Multiple USSTRATCOM assessments have identified JEMSO readiness shortfalls, which are growing. Our adversaries have dramatically increased their offensive and defensive capabilities in recent years; the DoD must similarly improve our ability to operate in a degraded electromagnetic warfare environment.

### **Missile Defense**

Cruise missiles continue to offer adversaries ways to generate strategic effects. USSTRATCOM is working closely with NORAD/USNORTHCOM, USINDOPACOM, and USSPACECOM to explore capabilities to enhance homeland defense and deter attack. Additionally, the Missile Defense Agency, Services, and CCMDs continue to develop and field defenses that protect the homeland and deployed forces while reassuring and defending our Allies and partners. We are committed to improving the Ground-based Midcourse Defense system and developing the Next-Generation Interceptor to augment and potentially replace the Ground Based Interceptor.

### **Hypersonic Weapons**

Long-range conventional hypersonic weapons will provide senior leadership additional strike options to hold distant and/or defended high-value, time-sensitive targets at risk without crossing the nuclear threshold. Conventional HSWs ensure long-range power projection in contested environments and enables more efficient and effective application of the nuclear force. While HSWs are not a replacement for nuclear weapons, these systems show promise as the conventional complement that the nuclear force needs to expand integrated deterrence options.

Rapid development and fielding of conventional HSWs is a top USSTRATCOM priority. The goal of fielding the first offensive hypersonic strike system is on the horizon with the Army scheduled to field a Long-Range Hypersonic Weapon battery in late 2023, followed by

the Navy Conventional Prompt Strike program beginning in the mid-2020s. The Air Force has demonstrated successes in the Air-launched Rapid Response Weapon program and hypersonic cruise missile technology pathfinder efforts. A robust scientific and industrial base is vital to ensure that HSWs are fielded in sufficient quantities. Additionally, a program for continuous technological improvement is important to meet the evolving security environment over the coming decades.

To operationalize these new capabilities in the near term, we are working across the Department to develop a concept of operation for HSW support to integrated deterrence. USSTRATCOM is working through policy, planning, and C2 processes, and—in conjunction with the Services and other CCMDs—is testing HSWs through a rigorous exercise program. Hypersonic weapons will have an immediate impact to operational plans by deterring and holding adversaries at risk while providing the nation with credible, strategic, non-nuclear response options when faced with armed conflict. Additionally, HSW-related agreements with Allies will further reinforce collective security, promote interoperability, and facilitate optimal deployment of these capabilities.

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**Document No. 5. Testimony by Greg Weaver, Senior Associate (Non-Resident), Project on Nuclear Issues, CSIS, before the Senate Armed Services Committee on Regional Nuclear Deterrence, Subcommittee on Strategic Forces, March 28, 2023.**

I believe improving our ability to deter and counter adversary limited nuclear use in regional conflicts is the most important challenge we face in US nuclear strategy. Let me explain why. It is broadly agreed the most likely path to nuclear deterrence failure is escalation in the context of a major conventional conflict between nuclear-armed adversaries. It is also broadly agreed the most likely path to a large-scale homeland nuclear exchange between major powers is escalation from limited nuclear use in the context of a large-scale conventional conflict. That is where broad consensus ends on how deterrence of limited nuclear use and large-scale escalation are related.

Some analysts and practitioners make two erroneous and dangerous assumptions regarding nuclear deterrence and nuclear escalation. First, they believe it is highly unlikely that nuclear deterrence will fail at any level, and under any circumstances, leading them to conclude that our planned capabilities are more than sufficient to deter limited use under any circumstances. Second, they also believe that if nuclear weapons are used at all, in any number or yield, the war will escalate rapidly out of control to a catastrophic large scale exchange almost automatically. These assumptions lead them to conclude that all that is needed to deter limited nuclear use is the latent potential for a large-scale US nuclear response, and that our current and planned capabilities are thus more than sufficient to deter limited use under any circumstances.

I think such a strategy is dangerously unsuited for credibly extending nuclear deterrence to US allies because I disagree with both of these assumptions, and so do Russian, and



possibly Chinese, strategists. As we consider how to deter limited nuclear first use we must first ask ourselves this question: Do we want to base our strategy to deter limited nuclear use on the presupposition that any limited nuclear use will result in uncontrolled escalation, and therefore such limited use won't happen if we rely on that threat? That is not a prophecy we want to become self-fulfilling if deterrence does fail in a limited way. But basing our strategy and force posture on these flawed assumptions risks making it just that.

In my view, central strategic deterrence of large scale homeland exchanges between nuclear-armed great powers is very stable, making limited use unlikely to escalate out of control rapidly. Note, I did not say that limited nuclear escalation cannot or will not escalate out of control. Of course it can, and our deterrence strategy should continue to leverage that risk without relying solely on it. But the decision to initiate a large-scale nuclear strike on the homeland of a nuclear-armed great power is clearly suicidal as long as both sides retain large-scale survivable second strike capabilities. Thus, leaders are likely to tolerate limited nuclear exchanges without conducting such a large-scale strike on the adversary's homeland. This is not because they want to wage limited nuclear war, but because the alternatives can be summarized as surrender or suicide. Deterrence is about what an adversary thinks, and how he calculates. There is no area of national security affairs in which the dictum "the adversary gets a vote" is more true. In a deterrence relationship, the adversary doesn't just have "a" vote, they have the only vote. It is our job to decisively influence how they cast it.

Deterring Russian limited use is the most immediate and challenging regional nuclear deterrence problem, so I will use the Russia problem to illustrate what we are up against. Putin's Russia cast their vote in favor of the use of large-scale military force against Ukraine, demonstrating both a high propensity to take risk, and to miscalculate in the process of doing so. That combination of risk-taking and miscalculation is extremely troubling, especially when paired with Russia's repeated brandishing of nuclear threats. Perhaps this dangerous propensity to take risk and miscalculate will be alleviated by Putin's eventual departure. But we can't count on that, and we don't know when that will be in any case. The Russian leadership's historical propensity to profoundly and repeatedly underestimate NATO's resolve and political unity under threat long preceded Putin, and will likely survive him, even if Russia's risk-taking propensity lessens somewhat in a post-Putin era. The dismal performance of Russian conventional forces in Ukraine is likely to lead them to further increase their reliance on nuclear weapons. This means that in a future war with NATO they could perceive the need to use nuclear weapons earlier in the conflict. If true, this means that once Russia reconstitutes its conventional forces, deterring Russian limited nuclear use will become even more important to deterring Russian conventional aggression than before Ukraine.

To formulate an effective regional nuclear deterrence strategy in Europe we must closely examine Russia's nuclear strategy and doctrine. Both are ultimately rooted in the assumption that limited nuclear use in theater is unlikely to escalate to a large scale homeland exchange, though I do not believe the Russians are certain they can avoid uncontrolled escalation. Based on the scope and content of China's ongoing nuclear buildup, their strategy and doctrine may be evolving based on this perception as well. Russian

conventional and nuclear strategy and doctrine are fully integrated. Their nuclear forces' role is to both deter large scale nuclear attacks on the Russian homeland and compensate for NATO conventional superiority through the limited use of nuclear weapons in theater through coercion if possible, but through defeat if necessary.

The coercive escalation option is to initiate limited first use of nuclear weapons to compel termination of an ongoing conventional war on terms acceptable to Russia. The defeat escalation option is to conduct large-scale theater nuclear operations against NATO's conventional forces if the Russian leadership assesses they pose a threat to "the very existence of the Russian state." This option is what drives Russia's force requirement for thousands of theater nuclear weapons embedded throughout their conventional forces. What, then, is required to deter Russian limited nuclear escalation in theater given their strategy and doctrine, their demonstrated propensity to take the risk of invading their neighbors, and their track record of miscalculating regarding NATO's will and cohesion?

Given that Russian strategy is based on the belief that mutual strategic deterrence of large-scale homeland strikes is very robust, deterrence of limited nuclear use requires the perceived ability of the US and our NATO allies to persevere in the face of Russian limited escalation without being politically coerced into accepting war termination on Russia's terms, and without being decisively militarily disadvantaged. That requires a set of US nuclear capabilities that are militarily relevant in such a conflict. Russian theater nuclear capabilities are designed to be just that: militarily relevant in a limited nuclear war. The evolution of Chinese theater nuclear capabilities seems to indicate they understand this as well.

In my view the core requirement for deterring Russian limited nuclear escalation in a war with NATO is a Flexible Response strategy that credibly convinces the Russian leadership that limited nuclear escalation does not provide effective insurance against miscalculating about NATO's resolve and cohesion, will not result in war termination on their terms, and does indeed run the risk of uncontrolled escalation because the United States and our Allies are visibly prepared for what Schelling called a "competition in risk-taking" to defend our vital interests.

Such a strategy must be enabled by US and Allied nuclear and conventional forces that are capable of three key things:

1. Providing a robust range of response options to restore deterrence by convincing Russian leadership they have miscalculated in a dire way, that further use of nuclear weapons will not achieve their objectives, and that they will incur costs that far exceed any benefits they can achieve.
2. Countering the military impact of Russian theater nuclear use.
3. Continuing to operate effectively to achieve US and Allied objectives in a limited nuclear use environment.

In sum, our strategy and capabilities must convince them with high confidence that nuclear escalation is always their worst option. And while there remains uncertainty about whether China's nuclear strategy and doctrine are shifting to match the comprehensive

nuclear buildup they are undertaking, we are likely to need to be able to do the same in the Asia-Pacific theater. Now for the nuclear capabilities bottom line: to meet the requirements for deterring limited nuclear use with high confidence we need a range of forward deployed, survivable theater nuclear capabilities that can reliably penetrate adversary theater air and missile defenses with a range of explosive yields and on operationally relevant delivery timelines. Based on these attributes, I do not believe that planned US nuclear capabilities are sufficient for the future threat environment we face. Strategic nuclear forces alone are insufficiently flexible and timely to convince a major power adversary that we are fully prepared to counter limited nuclear first use with militarily effective nuclear responses of our own. Given Russian strategy, doctrine, and capabilities, theater nuclear capabilities are required.

Completing the modernization of our dual capable fighter aircraft capabilities is necessary, but not sufficient. Our planned theater nuclear forces are too small, insufficiently survivable, and insufficiently militarily relevant. But they could be improved to be a much more credible deterrent to limited nuclear use without having to match Russia and China weapon for weapon. We should supplement dual capable fighter modernization with at least one more survivable, forward deployed, selectable yield delivery system with a higher probability to penetrate advanced defenses. There are several candidates that could meet this requirement, but I assess that SLCM-N deployed on attack submarines is the best solution for the following reasons:

It is highly survivable day-to-day, and thus not subject to preemptive strike.

It provides theater nuclear deterrent presence, whether it is actually present or not.

It provides an effective ability to penetrate, in part due to in some instances being capable of launch from inside the outer edges of an adversary's integrated air defenses.

It provides operationally significant promptness when compared to bomber-delivered ALCMs.

It exploits the attack submarine fleet's large pre-existing launcher infrastructure, reducing cost.

It has no ballistic missile launch signature that could be misinterpreted by an adversary.

It could leverage the LRSO program, reducing the impact on our nuclear weapons enterprise.

No other system I am aware of checks all those boxes. In conclusion, regional nuclear deterrence is not the place the US should choose to take risk, and not only because theater deterrence failure is the most likely path to large scale nuclear war that poses an existential threat to the United States, though that is a pretty good reason in and of itself. An inability to confidently deter or counter limited theater nuclear use will undermine the credibility of US capability and willingness to decisively project power against a nuclear-armed adversary in defense of US and Allied vital interests. Our Allies have not forgotten this. Neither should we.