UNITED STATES SPACE COMMAND

PRESENTATION TO THE
SENATE ARMED SERVICES COMMITTEE
U.S. SENATE

Subject: Fiscal Year 2024 Priorities and Posture of United States Space Command

STATEMENT OF: General James H. Dickinson
Commander, United States Space Command

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INTRODUCTION

On behalf of the 18,000 men and women of the 11th combatant command, U.S. Space Command, it is my honor and pleasure to testify before the committee. Our team is operating around the world providing satellite communication, space domain awareness, offensive and defensive space control effects, and positioning, navigation, and timing (PNT) services 24 hours a day, 7 days a week, 365 days per year. Space is fundamental to all joint military operations as outlined in the National Defense Strategy. It is also critical to our way of life enabling modern banking transactions, navigation, communication and so many other capabilities vital to our society and economy. Space touches our lives every day.

As the complexity of this domain grows, we must grow capability to provide the President and Secretary of Defense with options to deliver operational and strategic effects to achieve national objectives. Today, access to space is increasingly contested and congested. 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).

My Command Strategy focuses on three areas to address the contested and congested environment: Strengthening Relationships and Attracting New Partners; Integrating Commercial, Interagency, and Academic Organizations; and, Building and Maintaining Competitive Advantage. The Command's disciplined focus on these areas has built irreversible momentum toward full operational capability and will ensure we deliver on our promise that there will never be a day without space.

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. Assured space-based assets, commercial space capabilities, and space domain awareness are imperative to global 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

The PRC aims to displace U.S. alliances and security partnerships in the Indo-Pacific region, surpass U.S. global influence and power, and revise the international order to advance its authoritarian interests. Beijing views the U.S. as increasingly determined to contain the PRC as it continues to modernize the People's Liberation Army (PLA) into a "world-class force" by the middle of the century. PRC military strategy remains fixed on the concept of "active defense" in all domains, including space.

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 space-based 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.

China's BeiDou navigation system, like the U.S. Global Positioning System (GPS), is operational and provides persistent, all-weather, and high-accuracy PNT services to users globally. The PLA uses BeiDou's PNT to enable force movement and precision-guided munition employment. This system also includes messaging and user-tracking capabilities that provide the PLA enhanced command and control (C2). China's delivery of BeiDou furthered a long-standing goal to reduce reliance on foreign satellite communications and navigation systems and to export its domestic alternative globally as part of its Belt and Road Initiative.

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.

Today, we continue to see cyber actors focusing their efforts on our space architecture, that of our Allies, and of our international and commercial Partners.

Russia conducted a destructive direct-ascent ASAT missile test on 15 November 2021. The resulting explosion generated a debris field that will threaten satellites and crewed space stations for decades. In contrast to Russia's deeply irresponsible test, the United States government announced in April 2022 that it will commit not to conduct destructive, direct-ascent ASAT missile testing, and that the United States seeks to establish this as a new international norm for responsible behavior in space. In its wake, in December 2022, one-hundred and fifty-five nations voiced their widespread concern at the United Nations General Assembly about the impact of destructive testing of direct-ascent ASAT missiles on the long-term sustainability of the outer space environment. One hundred and fifty-five countries at the United Nations joined the United States in calling upon all nations to commit not to conduct destructive direct-ascent ASAT missile tests.

The Defense Intelligence Agency's 2022 Challenges to Space Report highlighted that Russia tested a space-based ASAT weapon in 2020. Russia has continued to research and develop sophisticated orbital capabilities that could serve dual-use purposes.

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.

STRENGTHEN RELATIONSHIPS AND ATTRACT NEW PARTNERS

U.S. Space Command plans and executes space operations in coordination with other combatant commands, the Services, DoD agencies, Allies, and a diverse array of international and commercial Partners to achieve national security objectives. Space Situational Awareness (SSA) Data Sharing Agreements are one avenue that U.S. Space Command currently uses to support the safety of the domain. SSA Data Sharing Agreements provide a mechanism for U.S. Space Command to receive and share unclassified SSA information with agreement partners to enhance the materials maintained in the U.S. Government space awareness catalogue, promote greater transparency in space, and to enhance global space-flight safety. Agreement partners are able to request support from U.S. Space Command in seven advanced areas. The use of these services demonstrates our partners' desires to promote responsible use of the space domain and safety of space-flight for all satellite operators in the U.S. and around the world. Currently the United States Space Command maintains 169 SSA Data Sharing Agreements with 129 commercial companies, 7 academic institutions, and 33 governments or international organizations.

Moving from a focus on promoting safe and responsible space operations to the imperative of assuring the advantages of space for national security, U.S. Space Command's rapidly expanding network of international military-to-military partnerships provides tremendous strength and resiliency for long-term space security and stability. Together, we contribute to deterring aggression and supporting the security and stability of space that generates prosperity for all. Our Allies and Partners possess complementary capabilities and forces that both cover current U.S. gaps and free U.S. assets for alternate priorities. They also contribute unique perspectives, regional relationships, and information sharing opportunities that improve our

understanding of the environment and expand our security cooperation options. U.S. Space Command's growing number of foreign liaison officers and exchange officers – 29 in total – are an example of the Command's priority to maintain connectivity with our foreign counterpart commands and better understand their perspectives and priorities.

Interweaving space capabilities into the warfighting functions and domains of our fellow combatant commands contributes an agile, credible, and integrated deterrent. In addition to our longstanding close partnerships with U.S. Indo-Pacific Command, U.S. European Command, U.S. Northern Command, and U.S. Central Command, U.S. Space Command, in collaboration with U.S. Africa Command and U.S. Southern Command, is developing opportunities to increase space capabilities and cooperation in Africa and Latin America. U.S. Space Command's Global Sentinel 2022 exercise included 24 international partner nations in one location participating in a modeling and simulation event based on integrated systems. The exercise focused on space domain awareness to support the protection and defense of shared security interests in outer space. Global Sentinel 2022 provided a significant strategic shaping opportunity to strengthen partnerships while amplifying U.S. Space Command and partner nation deterrence and assurance messaging. Global Sentinel evolved from its inception in 2014 and is an ongoing annual effort, comprising six to eight real-world events and a capstone. Global Sentinel remains the only event of its kind that includes multinational military partners from all major theaters, furthering collaboration focused on SSA and space domain awareness.

U.S. Space Command provides space planning and operations expertise, including integration, coordination, and deconfliction of capabilities to all combatant commands through our Joint Integrated Space Teams. These teams, combined with joint planning and targeting, ensure space capabilities are ready when needed. U.S. Space Command is fully integrated with

U.S. European Command's response to Russian aggression in Ukraine. We are tightly aligned and synchronized with U.S. Indo-Pacific Command to deter, and if necessary, defeat our nation's pacing threat. U.S. Space Command maintains close coordination with the Military Services as they develop future capabilities and competencies that will add to our decisive advantage.

U.S. Space Command is implementing the Mission Partner Environment (MPE) as our operating framework for communicating with Allies and Partners. The MPE enables C2 and information sharing across a range of military operations and enables information exchange between all participants within a specific partnership or coalition. The MPE supports execution of critical joint warfighting functions: C2, intelligence, fires, movement and maneuver, protection, information, and sustainment. Commanders require common services such as chat, secure voice, and email across the enterprise and expeditionary levels of operation for human-to-human collaboration. The MPE enables the DoD to appropriately share information with mission partners at the speed required for operations.

U.S. Space Command is continually planning to ensure we are prepared to respond to all contingencies. The command has developed the capacity to synchronize effects across combatant commands to achieve integrated operations in campaigning and contingency -- a first for the command and the DoD. These efforts ultimately provide space enabled effects to enable and assure effective land, air, and sea operations.

INTEGRATING COMMERCIAL, INTERAGENCY AND ACADEMIA

Mutually beneficial alliances and partnerships provide an asymmetric strategic advantage unmatched by our competition. Our robust and growing team of Partners includes commercial, interagency, and academic organizations. Together these Partners develop and deliver greater military space power that deters aggression and supports space domain stability. U.S. Space Command has published a Commercial Integration Strategy to enhance the command's overall military space power through the collaboration, integration, and partnership with U.S. commercial industry. The strategy sets priorities and synchronizes commercial integration efforts so that U.S. Space Command can mitigate capability gaps, improve space architecture resiliency, and gain and maintain a technological and operational advantage over adversaries.

Establishment of a New National Space Traffic Management and Coordination Capability

U.S. Space Command continues to develop partnerships with the U.S. Space Force and the Department of Commerce. As directed by the President in Space Policy Directive 3 and the United States Space Priorities Framework, civil and commercial space data sharing responsibilities will be led by the Department of Commerce. We also continue engagements with the broader interagency community and the civil and private sectors. These partnerships will endure and strengthen over time.

When the DoD began providing spaceflight safety data to global satellite operators in 2010, roughly 110 organizations flew a total of 890 satellites amidst a background of 21,000 pieces of trackable debris. Today, U.S. Space Command supports 680 organizations flying 7,500 satellites in all orbits. Two United States commercial companies have produced more than half of those 7,500 satellites currently on orbit. Since U.S. Space Command's inception in 2019,

trackable debris has increased sixty percent from roughly 25,000 pieces to more than 40,600 pieces. The transformation of space architectures and economics, and the dramatic short-term increase in debris, highlight that space congestion will be the norm moving forward. Other countries could also grow their space operations, highlighting that a more comprehensive and sustainable approach is required for space operations and spaceflight safety coordination.

Human Space Flight Support Improvements

As the DoD lead for human space flight support, U.S. Space Command has a close and vibrant relationship with the National Aeronautics and Space Administration (NASA). Our most visible effort is the preparation for the terrestrial rescue, recovery, and retrieval of astronauts and spacecraft. U.S. Space Command and NASA also partner on issues such as space domain awareness, in-space and on-orbit applications and manufacturing, planetary defense, and hypersonic technology.

U.S. Space Command is fully committed to NASA's human space flight program. This crucial partnership will deepen as NASA's Artemis operations expand, the U.S. returns to the moon, and exploration and development of cislunar space continues.

National Reconnaissance Office and Commercial Integration Strategy

U.S. Space Command continues our exceptional working relationship with the National Reconnaissance Office (NRO) and other intelligence community (IC) Partners. This relationship improves our ability to gain actionable intelligence, establish priorities, and provide global support to the rest of the Joint Force. We developed a comprehensive operational deconfliction process with the NRO and IC that enables seamless integration while delivering combined space effects for contingency operations.

U.S. Space Command has developed a Commercial Integration Strategy to advance collaboration, synchronize integration, and expand partnerships with U.S. commercial industry. The Combined Joint Commercial Integration Office ties together commercial stakeholders across the spectrum and drives implementation of this strategy.

The Command leverages commercial space domain awareness data through our Joint Task Force-Space Defense Commercial Operations cell (JCO). The JCO provides operationally relevant commercial space domain awareness to the National Space Defense Center. We are rapidly moving toward around-the-clock JCO operations to optimize information sharing between Allies and commercial Mission Partners.

The Command also leverages commercial ISR, space domain awareness, and SATCOM through the Combined Forces Space Component Command's Commercial Integration Cell (CIC). The CIC works with industry through mutually beneficial collaborative partnerships. As the CIC continues to attract commercial Mission Partners, U.S. Space Command can share SSA data with these additional commercial providers across multiple classification domains.

BUILDING AND MAINTAINING COMPETITIVE ADVANTAGE

Our competitors have counterspace capabilities and military doctrines that extend their concept of warfighting to space. Consequently, we must develop and field capabilities to contribute to integrated deterrence in accordance with the National Defense Strategy. U.S. Space Command identified five priority requirements to accomplish the responsibilities assigned by the Unified Command Plan (UCP). These include: (1) Integrated Space Fires and Protection, (2) Resilient, Timely Space C2, (3) Enhanced Battlespace Awareness, (4) Space Systems Cyber

Defense, and (5) Resilient Satellite C2 Architecture. Additionally, rapid investment in Global Sensor Management, Persistent and Resilient ISR, Operational Intelligence, Modernized and Agile EW Architecture, and Electromagnetic Battle Management will underpin long term success of our protect and defend mission. Relentless pursuit of these key integrated requirements will ensure we remain the dominant force in the space domain.

Integrated Space Fires and Protection Capabilities

Every day, civilians and the Joint Force depend on U.S. space capabilities. To assure the critical services provided by these capabilities, the DoD must have the infrastructure to deter aggression and protect these capabilities from attack. Resiliency is fundamental, but resiliency alone will not deter attacks or provide protection sufficient to assure our space assets. For U.S. Space Command to protect and defend U.S. and, as directed, Allied, Partner, and commercial space assets such as PNT, communications and missile warning/missile tracking, we require Congress' continued investment in joint military space capabilities, resilient architectures, and protection efforts.

Resilient, Timely Space C2

Resilient, timely C2 is key to deterring and defeating hostile action in space and terrestrially. Rapid and robust communication between space activities, space assets, and partner combatant commands enables decisive action. The increasingly dynamic space environment requires a resilient C2 architecture to synchronize space forces and effects for both operations in the contested space environment and as a critical enabler to traditional terrestrial maneuver forces. Congress's investment in the Combined Space Operations Facility addresses that need and will remain critical moving forward.

Enhanced Battlespace Awareness

U.S. Space Command relies on a near-real time, comprehensive understanding of the congested and complex space operational environment. Space domain awareness data, C2 automation, and machine learning allow us to better understand the threat in U.S. Space Command's astrographic area of responsibility (AOR). This critical task requires more accurate, robust, resilient, and timely space domain awareness and operational intelligence data from all interoperable sensors. This will produce highly accurate, rapidly available detection, tracking, and characterization of space objects, regardless of their origin. Current space domain awareness systems are stove piped, disaggregated, and lack the agility necessary for dynamic tasking. U.S. Space Command, the Missile Defense Agency, and the U.S. Space Force are partnering to enhance sensor integration into a C2 program. Congress' funding of programs to enhance battlespace awareness is crucial to ensuring U.S. Space Command can best protect and defend our vital space assets rapidly and dynamically.

Space Systems Cyber Defense

Digital superiority is key to building and maintaining a competitive advantage. The PRC, Russia, and other cyber actors are tirelessly working to infiltrate our cleared defense contractor, academic, and military networks. These adversaries seek to monitor and exfiltrate data, and reduce, degrade, and deny our ability to command, control, and communicate with on-orbit space assets and supporting ground systems.

Loss or compromise of U.S., Allied, or Partner space systems degrades the Command's ability to conduct operations in and through space and support terrestrial operations around the globe. Much of the digital infrastructure for these space mission systems requires modernization. As our adversaries' cyber capabilities are evolving, we need our defensive cyber systems to

outpace their growth. We need to be agile and find ways to become more resilient. We continue to collaborate with U.S. Cyber Command, Combat Support Agencies, and other government partners to deploy and integrate defensive cyber systems and tactics to maintain safe, secure, and reliable network operations.

The Command's Joint Cyber Center continues to partner across the DoD and with the Department of Homeland Security to prioritize cyber defense efforts. Increased funding for cybersecurity systems, persistent defensive cyber capabilities, and cyber experts is critical to maintaining dominance in the space and cyber domains.

Resilient Satellite C2 Architecture

U.S. Space Command seeks to improve resiliency in our globally dispersed ground terminal architecture and the Satellite Control Network (SCN). The current SCN system and follow-on architecture must be hardened and modernized to be able to fight through a highly contested environment. Mobile assets fielded with emerging technology to augment our global ground C2 centers will increase resiliency and underpin achieving national security objectives. U.S. Space Command has several requirements for the Joint Space Communication Layer (JSCL), which is the space transport layer of the DoD Information Network for SATCOM. For example, it must be scalable to meet the growing military and commercial SATCOM demand and operationally flexible enough to respond to adversary threats. Further, the JSCL must be interoperable with Allied and Partner systems to synchronize communications in a rapidly changing, multi-domain environment.

Force Development

U.S. Space Command's most important asset is our people. We are rapidly onboarding and developing a very talented team of space professionals. Our strategic advantage comes

through the diversity of experience and wisdom of our workforce. U.S. Space Command professional development programs boost our military promotion rates and our civilian employees' advancement potential. As our military members rotate out of the command and return to their parent service units, they bring invaluable space expertise back to the broader Joint and Combined Force. We visit colleges and universities to recruit recent graduates for civilian internships and job opportunities. We continue to advocate for hiring efficiencies that allow us to rapidly hire and onboard civilian employees. We recently established a command Academic Engagement Enterprise to partner with universities across the country to enhance workforce professionalization and improve U.S. Space Command's engagement in that critical space. We have full-time civilian advisors dedicated to building workforce resiliency and preventing discrimination, sexual assault, and harassment in the workplace to ensure our workforce remains empowered to reach its full potential.

As of 1 January 2023, we have 62 percent of our authorized military and government civilian end strength in place. If we include our contractor workforce, that number rises to 82 percent, a significant achievement three years into the command's five-year programmed manpower growth plan.

Resilient Space Architecture and Rapid Reconstitution

Over the last five years, the threats to our space enterprise systems have increased. We must modernize our space enterprise to ensure resiliency and agility and to preserve freedom of action despite these advancing threats. The ability to rapidly reconstitute requires us to prioritize seamless integration between old and new space capabilities (such as networks, space assets, links, and ground systems). This is essential to optimizing our data collection, processing, exploitation, and dissemination. U.S. Space Command is conducting a series of review efforts to

examine the resiliency of the space enterprise. We are identifying strengths and weaknesses of our current architecture, challenges to interoperability, and current policy limitations inhibiting shared space domain awareness. We are examining end-user interfaces, terrestrial systems, and communications links to orbital assets. In collaboration with the U.S. Space Force, our Allies, and Partners, U.S. Space Command is developing the requirements for a modern, integrated space architecture capable of operating in an increasingly contested space environment.

Dynamic Space Operations

Over the last five years, explicit and implicit threats to our on-orbit assets have increased. To preserve freedom of action, we must relentlessly pursue a new concept of employment - Dynamic Space Operations (DSO). Maneuvers by our current space systems are constrained by the fixed quantity of consumable resources on-board. This forces space warfighters to balance use of on-board resources to mitigate or counter current threats against the risk of insufficient resources to respond to future challenges.

Dynamic Space Operations includes the ability to restore consumables of on-orbit platforms or rapidly replace the platforms themselves. DSO will enable space operators to quickly respond to adversary operations, support readiness campaigns, and engage in self-defense, with less concern for future use implications. It will enable expanded multi-mission operations with less risk of depleting those limited consumables and mission capabilities. DSO will dramatically increase our ability to support geographic combatant commanders' operational requirements across the entire spectrum of competition, crisis, and conflict. Programs are underway within the DoD, the national laboratories, and across industry to address the technological challenges associated with DSO. U.S. Space Command is actively engaged with developmental efforts and working groups like the In-space Servicing Assembly and

Manufacturing Interagency Working Group. Our near-term DSO objective is to conduct an on-orbit demonstration to restore a satellite's maneuver capability by 2026. Our longer-term objective is to develop the necessary mission requirements and technical standards to ensure most capabilities delivered beyond 2030 will not be limited by consumables. We ask for Congress' support for these vital efforts as we develop and secure these crucial capabilities. Freedom to maneuver in space without concern for limiting future maneuverability will be an important capability for systems that are survivable against threats.

Maintenance and Hardening of Critical Infrastructure

U.S. Space Command's assigned AOR begins at an altitude of 100km – roughly 62 miles – above the surface of the Earth and extends indefinitely. Our operating domain extends around the globe and encompasses all three segments of our space systems: on-orbit assets, ground stations, and the cyber links connecting them. Updates to the ground segment are required to ensure our satellites can provide mission-critical information to the Joint Force and national decision makers. For example, our missile warning mission relies heavily on ground-based radar systems that require reliable power and cooling systems. Many of the facilities and infrastructure supporting U.S. Space Command exceed 60 years of service. It is increasingly difficult to maintain the necessary infrastructure for our assets to guarantee the resiliency, survivability, and endurability required for our critical space missions. Stop-gap measures are increasingly ineffective due to the lack of replacement parts and the inordinate time required to make repairs. We must modernize our aging infrastructure to keep pace with our competitors. I am grateful for Congress' continued support to ensure these facilities adequately support U.S. Space Command's no-fail missions.

Commercial space systems provide essential capabilities to our national security and civilian life. U.S. Space Command works with interagency and commercial space system stakeholders through the Critical Infrastructure Partnership Advisory Council to improve the security, resilience, and cybersecurity of commercial space systems.

At our provisional headquarters in Colorado Springs, the DoD has invested in existing on-installation facilities and off-installation federally leased buildings to meet U.S. Space Command requirements. Our provisional facilities on Peterson Space Force Bases are 30 years old. We accomplished major building system upgrades and repairs to meet mission requirements (such as power, communication/technology, and cooling). U.S. Space Command's provisional headquarters in Colorado Springs supports 1,230 personnel with the required communication, technology, and capabilities and will support full operational capability.

Exercises

U.S. Space Command executes the Presidentially assigned UCP responsibility for Joint Space Operations Training. As such, the Command is integrating joint and combined space scenarios and training across the Joint Force. We will conduct two mission centric exercises in FY23 as building blocks to a full-scale Tier 1 exercise in FY24 to emphasize the key transitions from competition through crisis and into conflict. This will highlight both the supported and supporting relationships between U.S. Space Command and the other combatant commands that will enable the Joint Force to overcome anti-access, area denial strategies.

Joint Warfighting Requirements

To maintain momentum, U.S. Space Command is developing joint warfighting requirements. We will continue to rely on the Services to contribute solutions that mitigate the capability gaps identified in these requirements.

Joint Space C2

The Joint Space C2 requirement established a set of threat-based requirements defining what the Command requires to comprehensively C2 forces across all mission areas. This includes deploying and connecting worldwide sensors and systems to national decision makers and all combatant commanders in near real time.

Space Effects to the Warfighter

To ensure space and space-enabled capabilities are available during conflict, U.S. Space Command is defining how to protect and defend space capabilities to guarantee space effects to the rest of the Joint Force. The Department will respond to hostile acts in space at the time, place, and domain of our choosing.

EW/Offensive Cyberspace Operation

U.S. Space Command is defining the required capabilities to integrate EW and offensive cyberspace operations. Close coordination with U.S. Cyber Command will enable joint fires to protect the space and cyberspace scheme of maneuver and provide the warfighting effects necessary to protect the rest of the Joint Force from adversary hostile uses of space.

Navigation Warfare (NAVWAR)/PNT

This NAVWAR/PNT requirement establishes the requirements that will inform future capability development by the services. This requirement is the initial step to informing the way the Joint Force, Allies, and Partners will keep pace with an advancing adversary threat. It will support the modern warfighter with scalable NAVWAR capabilities, integrate with our partners, and support a redundant and resilient NAVWAR/PNT architecture.

CONCLUSION

U.S. Space Command is rapidly approaching full operational capability. I am exceptionally proud of the progress the Command has made over the last three and a half years. There is no combatant command, warfighting domain, nor element of national power that is not strengthened by the space capabilities and effects that U.S. Space Command provides or protects. I am grateful to Congress for your support that has enabled our success. I ask for your continued support for the necessary resourcing to ensure we maintain our competitive advantage in the increasingly contested space domain.

We will continue to grow our critical network of Allies and Partners to integrate joint military space power into all-domain global operations to deter aggression, defend national interests, and when necessary, defeat threats. On behalf of the most critical asset in our command, the Soldiers, Marines, Sailors, Airmen, Guardians, civilians, and families of U.S. Space Command, thank you for your support to our mission.