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SUBCOMMITTEE ON STRATEGIC FORCES
SENATE ARMED SERVICES COMMITTEE
UNITED STATES SENATE

DEPARTMENT OF THE AIR FORCE

PRESENTATION TO THE
SUBCOMMITTEE ON STRATEGIC FORCES
SENATE ARMED SERVICES COMMITTEE
UNITED STATES SENATE

SUBJECT: Fiscal Year 2020 Priorities and Posture of the National Security Space Enterprise

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INTRODUCTION

Chairman Fischer, Ranking Member Heinrich and distinguished Members of the Committee, I'm honored to appear before you today in my capacity as Vice Commander of Air Force Space Command (AFSPC). With General Jay Raymond in command, we have the distinct privilege to lead and represent the 26,200 dedicated men and women of AFSPC who underpin successful operations for our joint force and the Nation. In the past year we have seen tremendous change and progress in the National Security Space arena with the Nation's on-going efforts to address the reality that strategic competitors have made space a warfighting domain. Among these initiatives are the President's issuance of four Space Policy Directives, direction to establish a space-focused combatant command – U.S. Space Command, and the Department of Defense proposal for a new branch of the armed forces -- the U.S. Space Force. We expect this next year will be equally full of progress across these and other National Security Space endeavors.

STRATEGIC SITUATION

Today, great power competition from a revisionist China and Russia continues to be the primary challenge to U.S. and global security. Both of these nations seek to challenge peace, stability and U.S. superiority in all domains: land, sea, air, cyberspace, and space. In the space domain in particular, these competitors are seeking to deny the U.S. and its Allies freedom of action, while also developing their own space capabilities to enable power projection and enhance military strength.

Fortunately, this comes at a time when our National Security Strategy, National Defense Strategy, national and military leadership, and Air Force Space Command plans, programs and operations are in unprecedented alignment. The National Security Strategy mandates we must maintain leadership and freedom of action in space, while advancing space as a priority domain. It also declares unfettered access and freedom to operate in space to be a vital interest. Our National Defense Strategy establishes five priority missions: (1) defend the homeland, (2) provide a safe, secure, and effective nuclear deterrent, (3) defeat a powerful conventional enemy, while we (4) deter opportunistic aggression, and (5) disrupt violent extremists in a cost-effective manner. Our space capabilities play a vital role in each one of the missions, supporting our joint warfighters and our allies and partners around the globe. Our national and military leadership

declare in unison that space is a warfighting domain, like land, sea, and air. Our goal remains to deter conflict from extending to space, and the best way we know how to do this is to be prepared to fight and win a conflict that extends to space should deterrence fail. My testimony will focus on how our activities are aligned with Department of Defense (DoD) priorities to build a more lethal force, strengthen alliances and attract new partners, and reform the Department's business practices.

BUILD A MORE LETHAL FORCE

We are increasing the combat readiness of Space Operators to increase joint warfighter lethality by investing to build multi-domain Airmen to fight and win as part of the Joint Force.

Developing our Warfighters

Foundational to building a more lethal force is the development of joint warfighters. The Air Force is transforming the way we develop our space combat tacticians and acquisition professionals, and laying the foundation for a trained, ready crew force. We have taken a number of actions to do so. For example, we directed a significant increase in rigor and content in the initial training of our space operators, known as Undergraduate Space Training, to meet the demands of current and emerging challenges to national security space. This revised "UST Next" is on track to start on 1 October 2019 and includes an additional 34 training days to cover evolving space threats and U.S. responses in greater depth. We have also expanded our Operational Training Infrastructure to produce a more relevant training environment, which allows weapon systems and operators to interact in a highly dynamic, threat-representative, realistic manner, including aspects of multi-domain command and control. The Air Force has approved \$74.8 million in funding to advance our space training simulators along these lines.

Additionally, AFSPC and the Air Force Weapons School established an Enlisted Space Warfighter Advanced Instructor Course and have selected the first class of students. This new course, held at Nellis Air Force Base, will provide advanced academic and tactical training for enlisted space professionals, and is a stepping stone for incorporating our enlisted operators into the existing Air Force Weapons School.

Advanced Space Operations School Re-designated as the 319th Combat Training Squadron

Air Force Space Command re-designated the Advance Space Operations School as the 319th Combat Training Squadron (319 CTS) on 28 August 2018 in an effort to normalize the squadron with the Air Force's 16 other combat training squadrons that have similar training

missions. As a combat training squadron, this unit will prepare space professionals for real-world operations in an increasingly contested space domain through exercises such as SPACE FLAG. The 319 CTS will provide training to tactical units with the purpose of developing critically-thinking operators who have mastered their weapon system to a degree such that they are able to fight through all levels of conflict.

Schriever Scholars

The Air Force is growing a cadre of strategic space leaders through the Schriever Scholars program at Air Command and Staff College. This new space concentration program for field grade officers consists of a demanding curriculum spanning space history, policy, strategy, and doctrine. The program also provides unique opportunities for engagement with senior DoD leadership and unprecedented access to top-level policymakers, including representatives at the White House, State Department, Department of Commerce, Department of Transportation, and NASA. This initial class of thirteen students graduate in June and will be prepared to ensure American advantage in the space domain for decades to come.

SPACE FLAG

SPACE FLAG is AFSPC's premier in-domain space protection exercise. This year we have expanded this advanced training to three times a year, providing space operators the experience of planning and executing space operations in a contested, degraded, and operationally-limited environment against a thinking adversary. In August 2019, we plan to incorporate our coalition partners in SPACE FLAG for the first time.

STRENGTHEN ALLIANCES AND ATTRACT NEW PARTNERS

AFSPC has made significant progress in expanding interagency, commercial, and international partnerships that enhance our position across the national security space portfolio. Recognizing that it is impossible to accomplish our mission alone, AFSPC is committed to identifying new partners and solidifying existing relationships as a core activity.

Joint Space Operations Center to Combined Space Operations Center

This year we have accelerated our efforts and increased our coalition footprint to conduct combined space operations. On 18 July 2018, the Joint Force Space Component Command (JFSCC) transitioned the Joint Space Operations Center (JSpOC) to a Combined Space Operations Center (CSpOC). The transition formalized our ongoing, decade-long effort to integrate Allied and partner nation personnel and capabilities into our space enterprise. We have

also established persistent connectivity with partner space operations centers in Australia, Canada, and the United Kingdom, and together we are working to identify additional tools to improve information sharing between our respective centers. In late 2019, we plan on expanding more classified operations and planning efforts with our FVEY partners through the establishment of a Combined Technical Operations Cell (CTOC).

Schriever Wargame

AFSPC annually conducts the Schriever Wargame, a scenario-based wargame designed to explore critical space issues in depth, investigate military utility of new space systems, identify solutions to common challenges shared by all participants, and advance space doctrine to better align with and support air, land, sea, and cyberspace doctrine. This annual wargame also helps increase international cooperation and integration among space-faring allies. This year's wargame included our FVEY partners (Australia, Canada, New Zealand, and the United Kingdom) along with France, Germany, and, for the first time, Japan. The outcomes of the Schriever Wargame Series continue to inform future AFSPC requirements, examine organizational constructs, and provide a venue for advancing space operational concepts and procedures. For example, it was the first time the participants employed a combined command and control (C2) cell for Special Access Programs (SAP). As previously mentioned, it is through this effort that participants agreed to stand up the first ever CTOC, the real world SAP C2 cell at the CSpOC, by the end of this year.

As a related effort, the Multinational Space Collaboration (MSC) Office at Vandenberg Air Force Base provides the means for direct dialog with multiple international partners extending beyond combined space operations, supporting strategic engagement objectives via bilateral and multilateral collaboration. Eight countries were initially invited to participate: Australia, Canada, France, Germany, Italy, Japan, New Zealand, Republic of Korea, and the United Kingdom. The MSC office currently includes liaisons from three partner nations: France, Germany and the United Kingdom, and MOUs are pending with Italy, Japan and the Republic of Korea.

Allies in Training

In coordination with Air Education and Training Command, AFSPC is working to increase coalition participation in its space courses. This fiscal year, AFSPC will offer Space 100 (foundational level space) to a growing coalition audience including: Australia, Brazil,

Canada, Chile, Colombia, France, Germany, India, Israel, Italy, Japan, NATO, New Zealand, Republic of Korea, Sweden, Thailand, and the United Kingdom. Space 200 (operational level space) is now open to New Zealand, and participation from the other FVEY partners has doubled with 20 allied personnel scheduled to attend this year. Space 200 will also open to France, Germany, and Japan with mobile classes available in 2019 and in-residence classes available in 2020. Finally, Space 300 (strategic level space) will have its first FVEY partner course in April 2019 with Australia, Canada, and United Kingdom personnel in attendance.

Hosted Payloads and Future Allied Partnerships

The Space and Missile Systems Center (SMC) is leveraging new business practices and methodologies to more rapidly field critical capabilities by placing hosted payloads on Allied satellites. Specifically, Norway will integrate Enhanced Polar System Recapitalization (EPS-R) payloads on two space vehicles and launch both satellites into a highly elliptical orbit in December 2022. EPS-R will provide protected communications for military tactical and strategic forces, as well as other users in support of Joint and Allied Force operations above 65 degrees north longitude.

Under the leadership of the Air Force Chief of Staff, we will host an international Air Chiefs Space Conference at the Space Symposium in Colorado this April. With 12 countries expected to participate, this inaugural event represents the first-ever global meeting of Air Chiefs to discuss partnering in the space domain. This demonstrates our commitment to pursue international relationships that promote common values and at the same time send a clear message to strategic competitors that cooperation between space-faring nations will complicate any pursuit of hostile action.

U.S. Government Partnering

Our partnering focus includes efforts within the United States government as well. Our teaming relationship with the National Reconnaissance Office (NRO) has never been stronger; we have worked together across a spectrum of projects, to include development of a strategy to protect and defend our space capabilities, shared Concepts of Operations (CONOPS) to realize that strategy, and partnerships on an enterprise space architecture and individual programs for mutual benefit. An example of the latter is our collaborative work on the space-based space surveillance effort called SILENTBARKER. While the Space-Based Space Surveillance Follow-On program remains under Air Force Service Acquisition Executive authority and

control, it contributes funding and personnel to the NRO for executing SILENTBARKER. SILENTBARKER, with Air Force support, increases mission capability and is more cost-effective. The Air Force and the NRO will mutually invest in non-recurring engineering costs, enabling the potential for a larger initial constellation buy and lowering unit costs. The Air Force is requesting an increase in funding across the Future Years Defense Program for expanded coverage across the geosynchronous belt and updating mission data processing and scheduling for the ground segment to leverage the full capability of the National Space Defense Center (NSDC).

In accordance with the President's direction in Space Policy Directive 3, we are teaming with the Department of Commerce to transfer the responsibilities for space traffic management (STM) to that Department. Together we will strengthen STM for all, while improving space situational awareness (SSA) data interoperability and enabling greater SSA data sharing.

REFORM THE DEPARTMENT'S BUSINESS PRACTICES

AFSPC has embraced an atmosphere of profound change, bringing forth business reforms that govern how we procure critical space assets in concert with our industry partners. This represents a culture change that is more agile and less risk-averse. To achieve our goals we must be willing to break down bureaucracy and embrace smart risk in order to accelerate capabilities development to meet the threat.

COMSATCOM Procurement Authority Transfer

To comply with the 2018 National Defense Authorization Act, responsibilities for DoD procurement of commercial satellite communications (COMSATCOM) services transferred from the Defense Information Services Agency to AFSPC on 11 December 2018. Beginning on 20 December 2018, AFSPC started to bring together both government and industry partners to chart a way forward to both enhance satellite communications (SATCOM) provisioning and our ability to provide SATCOM in a contested environment. We are using this transfer as a mechanism to improve military and commercial SATCOM support across the board and the AFSPC team is finalizing the first of a series of concepts and strategy documents that will shape our SATCOM investments.

Space and Missile Systems Center 2.0

The Space and Missile Systems Center has embarked on a transformation to deliver resilient, war-winning space capabilities more quickly. SMC 2.0 removes layers of bureaucracy,

linking program leadership directly to acquisition decision authorities in order to speed decision making. The strategic outcome of SMC 2.0 will be to dominate with superior lethality throughout the space domain, aggressively deliver warfighter needs from a resilient, integrated enterprise, and drive innovation in a way that outpaces adversarial threats.

Space Rapid Capabilities Office (SpRCO)

The SpRCO was created through the Fiscal Year 2018 National Defense Authorization Act (NDAA), with subsequent authorities defined in the Fiscal Year 2019 NDAA. The office is governed by a Board of Directors, chaired by the Secretary of the Air Force, and consists of the Air Force Chief of Staff, Assistant Secretary of the Air Force for Acquisition, Technology, and Logistics, the AFSPC Commander, and USSTRATCOM/JFSCC Commander, with authorities and processes outlined in an approved charter. AFSPC continues to grow the SpRCO and make progress with AFSPC's ability to rapidly field space capabilities. The Board of Directors signed the governing charter on 1 November 2018 and USSTRATCOM validated five SpRCO programs through the JFSCC. The initiation of three out of the five programs was formalized by the Board of Directors on 31 January 2019. Acquisition, security, and contracting authorities have all been codified and infrastructure, personnel, and security resources are in place to initiate these programs. Interim acquisition and security authorities are being provided by Air Force Rapid Capabilities Office Director; authorities will transition to the newly hired SpRCO Director by April 2019.

Prototyping: Space Enterprise Consortium

The Space Enterprise Consortium (SpEC) is a team of industry leaders, academic research institutions, and innovative early-stage and start-up companies working together to develop next generation space technologies. Prototyping awards now broadly represent many of our most critical warfighter requirements, to include protected satellite communications, missile warning, missile defense, space situational awareness, and standardized satellites, payload and commanding interfaces.

A RESILIENT SPACE ENTERPRISE

AFSPC has made significant progress across all mission areas that span the breadth of our space capabilities. Execution of the Department's strategy to protect and defend our space capabilities is persistent, ongoing, and present across all mission areas.

Command and Control

For operational level C2, Enterprise Space Battle Management Command and Control (ESBMC2) provides the C2 and SSA capabilities to gain and maintain space superiority. It also serves as the Air Force space system element of Air Force Multi-Domain Command and Control efforts. Our early ESBMC2 prototypes have demonstrated initial interoperability with Air Combat Command (ACC), the Intelligence Community, and the Missile Defense Agency to synchronize operations. We continue to support Air Force efforts to advance interoperability with ACC's Airborne Battle Management System.

One of the more important aspects of ESBMC2 is its open architecture. ESBMC2 uses Open Missions Standards (OMS) as its architecture standard and the Universal C2 Interface (UCI) as its communication standard to enable interoperability amongst the entire DoD space portfolio. We have seen success of this approach in early ESBMC2 prototypes allowing integrated C2 on timelines that the JSpOC Mission System could never have provided. This open approach also encourages companies to develop applications and compete in an environment in order to foster innovation. The price of entry for commercial companies to develop applications for ESBMC2 is simply to adhere to OMS and UCI specifications.

Space Situational Awareness

SSA is the foundation upon which the Department maintains spaceflight safety, provides warning, assesses intentions, and attributes adversary actions towards U.S., Allies, and commercial partner satellites. Coupled with operational intelligence to complete the SSA operating picture, competency in this area is critical in protecting our space assets, informing the design of future architectures, and fostering access and responsible use of space for all space-faring nations. The following key efforts represent SSA capabilities necessary to protect U.S. Government satellites and interests in space.

The new Space Fence is an S-Band radar designed for space surveillance located on the Kwajalein Atoll, Republic of Marshall Islands, 2,100 nautical miles southwest of Honolulu, Hawaii. It is expected to increase the number of tracked objects in space from 23,000 to more than 60,000, as well as increase the accuracy of orbit predictions, and improve our ability to characterize previously untracked objects and conduct collision avoidance analysis for all objects in space. Expected to achieve initial operational capability (IOC) within the next year, Space Fence will be the largest dedicated space surveillance radar operated by AFSPC.

The National Space Defense Center

The NSDC continues to mature its partnership between the DoD and Intelligence Community as we push to improve our nation's ability to rapidly detect, characterize, attribute, warn and defend against threats to our nation's vital space systems. In January 2018, the NSDC transitioned from an experimentation-focused entity to limited 24/7 operations. The fiscal year 2020 budget request supports efforts to leverage the full capability of the NSDC and I am pleased to report that the NSDC has continued to mature throughout the year and has now taken on all Protect and Defend responsibilities previously executed by the CSpOC.

The Air Force Research Lab has been working to deliver a Joint Emerging Operational Need (JEON) effort for the NSDC to provide capabilities to integrate systems and information at a "system high" level. By operating at the highest security levels throughout the operations center, the NSDC will become a singular center for the full picture of space activities. The completion of JEON-associated work in June 2019 will mark the delivery of a functioning prototype capability and then transition to an initial operational capability by year's end.

Position, Navigation, and Timing

The first Global Positioning System (GPS) III satellite was successfully launched in December 2018 on the SpaceX Falcon 9 rocket. Ultimately, GPS III will provide signals that are three times more accurate and provide up to eight times more anti-jam resilience for the warfighter than previous generations. The GPS Next-Generation Operational Control System (OCX) Block 0 supported GPS III Space Vehicle (SV) 01 launch and the team is completing early orbit checkout without issue. The OCX program addresses cyber vulnerabilities through a robust information assurance architecture and is on-track to deliver its full capability by April 2022.

The GPS III program is preparing GPS III SV 02 to support a summer 2019 launch and continues to assemble, test, and integrate the remaining eight satellites. In addition, SMC awarded the GPS III Follow-on (GPS III F) contract for 22 satellites in September 2018. This year's budget request includes full funding for SV 13 and continued incremental RDT&E funding for GPS III F SVs 11 and 12.

Missile Warning

In the fiscal year 2019 budget request, the Air Force took the bold step to stop procurement of Space-Based Infrared System (SBIRS) vehicles 7 and 8 in acknowledgement of

their inability to survive in today's contested space environment. The Next-Generation Overhead Persistent Infrared system will succeed the current SBIRS system by providing improved missile warning, missile defense, battlespace awareness, and technical intelligence capabilities that are more survivable against emerging adversary threats. The Air Force is applying acquisition authorities (per Section 804 of the Fiscal Year 2016 NDAA) to manage the program's largest risks through competitive prototyping, and to significantly improve execution speed. Using these authorities, and with funding support from Congress, the program let two prime contracts within three months, posturing the Air Force to reduce the time to IOC by three and a half years. This pace setter proves that a five year acquisition timeline to deliver resilient missile warning capability, versus a ten or fifteen year timeline, is possible. Additionally, the Air Force has aligned the fiscal year 2020 budget request to support program execution and as expected deliver the first resilient geosynchronous satellite to meet warfighter needs by 2025.

Environmental Monitoring

Every DoD operational mission begins with a weather briefing; either space weather, terrestrial weather, or both. Although the data required to generate forecasts for our warfighters is largely dependent on complex models, approximately 95 percent of the data that feeds these models comes from either space-borne assets or ground-based observatories looking at space. Our ground-based infrastructure consists of unique assets strategically situated around the globe to observe the sun and the ionosphere from below and collect the data we need to complement the space-borne information. The data required for DoD missions is often unique and necessitates 24/7 global ability to forecast weather in austere and denied environments.

Weather is also a partnership business. We continue to leverage the outstanding contributions of NOAA, NASA, our European EUMETSAT colleagues, and Japan. As an example, we will also soon accept a NOAA geostationary satellite, repurposed for our DoD mission, and relocate it over the Indian Ocean.

We are currently updating the space piece of the overarching Air Force weather strategy for both terrestrial and space weather support. Our long term vision, in addition to the avenues we already have, is to determine how commercial ventures could add to and diversify our ability to collect our required data from space. This is a very new and potentially beneficial partnership, which we will be able to more completely characterize after we do some investigation and development of their abilities.

Satellite Communications

The Advanced Extremely High Frequency (AEHF) satellite constellation provides protected tactical and strategic, nuclear-hardened communications for the President and other decision makers. With three operational satellites on orbit, a fourth is undergoing on-orbit checkout and will be operational in July 2019. The final two satellites are scheduled to launch in fiscal years 2019 and 2020 respectively. Ongoing Space Modernization Initiative efforts include AEHF expanded spacecraft resilience features and enhanced ground cyber protection. The Air Force is currently pursuing the next generation of protected, strategic communications with the acquisition of the Evolved Strategic SATCOM system which utilizes Section 804 authorities to deliver capability two years sooner than a traditional acquisition. The Air Force is currently preparing the release of a request for proposal for rapid prototyping for this next generation of protected strategic communications.

The Protected Tactical Enterprise Service effort has been enabled by Section 804 authorities to deliver prototype capability for two Navy carrier strike groups 18 months early. This ground system will provide worldwide, anti-jam, Low Probability of Intercept communications for tactical warfighters. The Protected Tactical Satellite Communications (PTS) effort will save about 36 months of schedule by implementing rapid acquisition via Section 804 authorities. PTS will provide advanced tactical SATCOM capabilities to enable tactical operations in anti-access/area denial environments. PTS awarded 13 prototyping projects using SpEC Other Transaction Authority (OTA) to help design and reduce risk of critical technologies.

Enhanced Polar System (EPS) hosted payloads launched in 2015 and 2017 and will provide tactical protected communications in the North Polar Region; EPS will achieve full operational capability in late fiscal year 2019. However, the need for tactical communication capabilities in the North Polar Region is anticipated to expand as U.S. and allied military and commercial needs continue to grow. As previously mentioned, the Enhanced Polar System – Recapitalization (EPS-R) is the protected SATCOM follow-on to the EPS, providing a 24/7 protected SATCOM capability to the North Polar Region. EPS-R payloads on two separate Space Norway spacecraft remain on track for a dual launch in fiscal year 2023 and will provide continuity of protected satellite communications services and bridges the gap between the current system and EPS at a significantly reduced cost.

Wideband Global Satellite (WGS) Communications SVs 8 and 9 entered operations in 2017 and SV 10 successfully launched on 15 March 2019. As the primary wideband satellite communications capability for DoD, SV 10 will extend functional availability to 2028. Per the Consolidated Appropriations Act of 2018, the Air Force is acquiring and further developing a funding plan for launch and operation and maintenance activities for a modernized WGS satellite with a digital payload comprising twice the capacity of the current version.

Assured Access to Space

For the first time in 20 years, the Air Force is prepared to meet all national security launch needs through competition among multiple viable launch providers. With unprecedented mission success in placing National Security Space (NSS) assets into orbit, the National Security Space Launch (NSSL) program, formerly known as the Evolved Expendable Launch Vehicle (EELV) program, provides assured access to space for our most important national security satellites, while demonstrating good stewardship of launch funds. Our priority remains to ensure the Air Force can launch all NSS payloads when and where we need to, utilizing launch services from certified domestic, commercial launch providers in a viable competitive market.

As the Air Force moves to recapitalize the NSSL program and end the use of the Russian-built RD-180 engine, AFSPC has entered into public-private partnerships, the best way to ensure emerging commercial launch solutions meet our most stressing NSS launch requirements. The SMC Enterprise Directorate awarded three Launch Service Agreements to develop domestic, commercially viable launch systems. The three agreements went to Blue Origin's New Glenn rocket, Northrop Grumman's Omega rocket, and United Launch Alliance's Vulcan rocket. These partnerships leverage commercial launch industry investment to deliver launch capabilities ahead of the RD-180 procurement deadline of 2022. NSSL Phase 2 launch contracts will facilitate full and open competition to procure launch services from fiscal year 2020 through 2024 for launch starting in 2022.

Last year Congress recognized the prospect of cost savings associated with launch vehicle reusability; the Air Force has embraced this concept and is actively evaluating the risks, benefits, and potential costs or savings from reusable launch vehicles for future missions. With launch service providers demonstrating success at a rapid pace, reusable launch systems could offer higher reliability, increased responsiveness, and greater flexibility in support of NSS missions. In an effort to lean forward on reusing hardware for launch, SMC and SpaceX

completed a contract modification allowing the reuse of the Falcon Heavy side core boosters for the Air Force's Space Test Program-2 mission. This first mission with a re-used booster further demonstrates our commitment to balance risk with increased responsiveness and flexibility.

In 2019, the DoD Space Test Program partnered with SMC's Enterprise Corps and Defense Innovation Unit to pursue the first launch of a venture-class small launch service through the Rapid Agile Launch Initiative (RALI). Under this partnership, the Air Force procured five small launch services through venture-class launch service providers using OTA agreements. RALI demonstrates rapid procurement and the responsiveness of commercial launch, dedicated launch for small payloads to militarily-relevant orbits, on-demand responsiveness, and increased operational tempo over legacy national launch architecture. RALI leverages an expanding commercial market and launch opportunities to increase DoD's access to space.

AFSPC places a high priority on streamlining space launch operations and identifying opportunities to improve our speed, innovation and resiliency to improve efficiency, satisfy national security needs, and increase safety. This includes an architecture transformation across both launch ranges that started in 2019 and will continue through 2023. Changes in flight and ground systems will put us on a path to support a 2025 implementation of the Autonomous Flight Safety System for all commercial space launches. This enables us to increase the pace of launch, reduce costly infrastructure, and maintain public safety.

Cyberspace Defense of the Space Enterprise

To protect our space enterprise from cyber threats, Headquarters AFSPC and SMC, together with our federally funded research development centers, will implement a full lifecycle effort for space and associated ground systems, applying robust cyberspace and defensive security protocols that will include adaptable, upgradable, hardened products and other best practices "baked in" at the time of product delivery. AFSPC is leading the Air Force, implementing a Defensive Cyber Operations for Space (DCO-S) strategy and organizational construct across a tiered defense posture to execute cyber defense in depth for space mission assurance.

Air Force Space Command is working with U.S. Cyber Command, joint partners, the Intelligence Community, research labs, and industry to develop and deploy cyberspace security and defense solutions to protect the space enterprise from cyber threats. AFSPC continues to

develop and educate cyber protection and defense personnel who work alongside space mission system operators to detect and respond to system vulnerabilities and adversarial activity. To rapidly enable DCO-S capabilities, AFSPC is executing a rapid acquisition approach to prototype and field improved technologies that will protect critical systems, investigate cyber events, respond to cyber incidents, and accomplish cyberspace security and defense objectives across the space enterprise.

THE WAY AHEAD

The fiscal year 2020 budget request strengthens the considerable gains AFSPC has made over the previous fiscal year with a proposed \$14 billion investment in our space portfolio, a 17 percent increase over our fiscal year 2019 budget. This budget request supports our warfighting approach to the space domain and supports changes to how we prototype and field innovative space technologies in order to stay ahead of our competitors.

I thank the Committee for your leadership and support; together we will build a resilient and ready National Security Space enterprise that will continue to serve as the foundation to our desire to maintain our military advantage and promote American prosperity.