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SUBCOMMITTEE ON STRATEGIC FORCES
HOUSE ARMED SERVICES COMMITTEE
UNITED STATES HOUSE OF REPRESENTATIVES

DEPARTMENT OF THE AIR FORCE

PRESENTATION TO THE
SUBCOMMITTEE ON STRATEGIC FORCES
HOUSE ARMED SERVICES COMMITTEE
UNITED STATES HOUSE OF REPRESENTATIVES

SUBJECT: Fiscal Year 2016 National Defense Authorization Budget Request for National Security Space Activities

STATEMENT OF: General John E. Hyten
Commander, Air Force Space Command

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Introduction

Chairman Rogers, Ranking Member Cooper and distinguished Members of the Subcommittee, it is an honor to appear before you for the first time as the 15th Commander of Air Force Space Command (AFSPC). It is my privilege to represent the 38,000 outstanding men and women of AFSPC currently stationed at 134 locations worldwide to include the over 1800 Airmen and civilians forward deployed in the past year. These dedicated Airmen provide space and cyberspace capabilities to our great Nation 24 hours a day, 7 days a week, and work through challenging operational scenarios and tight budget constraints to ensure capability is delivered to the warfighter when and where it's needed.

As a new commander, I want to ensure our priorities align with our ever important mission and vision, which remain unchanged.

Win Today's Fight

It is a simple message, but one of utmost importance. The Nation depends on this command to deliver game-changing effects in both the space and cyberspace domains, and we must continue providing that as quickly, as effectively and as efficiently as possible. As we develop systems and personnel for space and cyberspace operations, our efforts will be focused to ensure the domains are manageable, securable and defensible within the United States Air Force (USAF) Total Obligation Authorities.

Prepare for Tomorrow's Fight

If war extends to space, as it has extended to every other domain on this planet, we have to be ready to fight and win in that domain. That means re-examining our development and acquisition process to deliver capabilities more quickly and efficiently while fully meeting our Nation's warfighting requirements. We will transition from a command focused on global space

operations and persistent network operations, to a more proactive, and if challenged, defensive space and cyberspace command.

Taking Care of Our Airmen and Our Families

For the past 20 years, this country has been in a perpetual state of conflict. The constant deployments, stressful operations tempo and uncertain fiscal environment have understandably taken a toll on not only our Airmen, but also on their families. To ensure resilience in the midst of these factors we must proactively implement the "Four Pillars" of the Comprehensive Fitness Program: physical, emotional, social and spiritual. We will continue a culture of respect and actively care for each one of our valued members and their families.

AFSPC Re-organization

In-line with re-examination of current procedures to better serve our Nation, AFSPC has implemented a new organizational structure within its Headquarters. One of the most significant changes is the merger of the A2 (Intelligence), A3 (Operations) and A6 (Communications) into a single Directorate. For this major command (MAJCOM) to execute its operational responsibilities, our intelligence, surveillance, and reconnaissance (ISR), space and cyber experts must work together seamlessly to build integrated operational solutions to meet warfighter needs. There are also other areas where it makes good sense to align with the organizational structure of our parent Air Force Headquarters (HQ). We have shifted the majority of our mid and long-term planning functions to the A5 and created an A5/8 (Strategic Plans and Requirements) to mirror the HQ Air Force A5/8 structure. Likewise, we have merged our programming and financial management functions into a single Directorate, the HQ AFSPC/FM (Financial Management), to mirror the SAF/FM organization which is now responsible for both programming and financial management at the Pentagon. Finally, one of the more demanding transitions is the

reorganization activities that are influenced by the standup of the new Air Force Installation and Mission Support Center (AFIMSC). The mission support functions that reside at the MAJCOM-level are being consolidated at the new AFIMSC. Amidst all the changes, I am confident the resultant HQ capabilities will dramatically enhance our contribution to national security objectives and the success of our warfighters.

Space and Cyberspace Integration

In previous eras, the largest army, navy, or air force was normally the victor; however, that traditional military equation no longer holds true. Today, it is about integration, synergy and leveraging the capabilities of multiple domains to create decisive battlefield effects to achieve victory. We have not lost sight of the fact that our space systems are intimately integrated into the cyber mission area. All command and control of space-based systems, and delivery of space-based products, are dependent on operations in cyberspace. Space capabilities, such as position, navigation and timing and weather are essential to kinetic operations and are delivered through cyberspace.

In the United Sates Air Force, our mission is to fly, fight, and win in air, space and cyberspace. At AFSPC, we are responsible for two of the three domains – space and cyberspace. In space, we provide pathways for information or control the information traveling through those pathways. It is in this respect the cyber mission is fundamentally the same as space and the reason it falls within our purview. Furthermore, when AFSPC's space and cyberspace missions integrate, it represents a force multiplier for all mission capabilities to the joint warfighter. AFSPC is not only providing multi-domain deterrence capabilities, but formidable integrated combat capabilities across the entire range of military operations. To that end, both the *National Military Strategy* and *DoD Strategy for Operating in Cyberspace* recognize cyberspace is no

longer a mere information conduit, but a domain. Like air and space, it is a domain in which we operate to provide effects to achieve our missions. The future of the United States Air Force is in leveraging Airmen's innovation across air, space and cyberspace to deliver integrated effects in support of Joint and Air Component Commanders.

The command must be prepared to face the increasingly complex and sophisticated threats in cyberspace. As the pace of technological and geopolitical change quickens, the ability of Joint Force Commanders to defend our Nation's interests will increasingly rely on the access, persistence and awareness provided by cyberspace systems and capabilities. Determinedly, Twenty-fourth Air Force, located at Joint Base San Antonio-Lackland, Texas, continues to take an operational approach to cyberspace to significantly increase our security posture, defend freedom of action and leverage our effectiveness across Joint and coalition operations.

Assured Access to Space

As we prepare to face the current and future challenges in cyber, AFSPC's oldest domain has its own obstacles. Since the Sputnik launch in 1957 getting to space has been important. However, with the nation's reliance on space capabilities, assured access to space has become one of AFSPC's highest priorities. It is essential we sustain a reliable capability to deliver national security satellites to space. The Evolved Expendable Launch Vehicle (EELV) team continues an unprecedented string of successful national security space (NSS) launches. In 2014, the Atlas V and Delta IV launch vehicles executed 13 launches, nine of which supported NSS missions, extending the record of EELV total launch successes to 78 as of March 2015. These launch vehicles carry some of our most precious spacecraft into orbit including global navigation and timing, missile warning, communications, weather and intelligence spacecraft.

In addition to building on the unprecedented string of launches, the launch enterprise team executed two launches in a span of only four days on the same coast, a remarkable achievement from a dedicated crew. Furthermore, the team also executed two launches in seven days, but from different coasts. The launch enterprise and EELV team remain focused on ensuring 100 percent mission success, one launch at a time.

Within the context of assured access to space, the Command's launch priorities are to reintroduce competition into the EELV program using the mission assurance processes that have made the EELV program successful while eliminating the use of the Russian RD-180 rocket engine. This commitment is exemplified by the dedicated professionals at the AFSPC Space and Missile Systems Center (SMC), under the command of Lieutenant General Sam Greaves, who have worked tirelessly to develop a plan to transition off the RD-180 without sacrificing assured access to space and mission assurance and to certify new entrants into the space launch enterprise.

Collaborating in Mission Assurance

On February 11, 2015, a SpaceX Falcon 9 lifted off from Launch Complex 40 at Cape Canaveral Air Force Station, Florida carrying the Deep Space Climate Observatory (DSCOVR) satellite. DSCOVR is the result of a partnership between the National Oceanic and Atmospheric Administration (NOAA), the National Aeronautics and Space Administration (NASA) and the Air Force, but more importantly is a prime example of where the Air Force, acting in its capacity as the mission's launch services provider, worked closely with SpaceX in the name of mission assurance. The Air Force and SpaceX teams put in significant effort together over the last two years in preparation for the DSCOVR/Falcon 9 mission. The transparency and collaboration developed over that period of time enabled the combined teams to cooperate in overcoming both

technical challenges and weather issues during the final days of the launch campaign. Ultimately, DSCOVR will be positioned 1.5 million kilometers from Earth to monitor and provide advanced warning of extreme emissions from the sun that could affect power grids and satellite operations. The combined team's focus on mission assurance culminated in a very successful launch and orbital insertion of the DSCOVR satellite, and bodes well for a future Air Force - SpaceX partnership.

Launch Competition

Since 2006, to safely launch our capabilities we have relied on a single industrial partner whose mission success is superior. This was necessary when there was a critical need for robust launch vehicle performance and limited business opportunities; however, the market is now expanding. U.S commercial companies want to invest in, and compete for, government contracts. The U.S. Government now has an opportunity to leverage the growing commercial launch market in order to drive price points on the NSS launch solution that would be more competitive for commercial launch. We are absolutely committed to support competition and a healthy space industrial base. In order to sustain an affordable assured access to space, we must have a healthy industrial base. There are good reasons for exacting standards and rigorous certification; however, we must continue to welcome new partners into this arena. The Air Force is committed to getting new entrants certified as quickly as possible.

Finally, it is important to note that the Secretary of the Air Force has directed a review of our new entrant certification process by an independent team to examine our processes, procedures and personnel resources dedicated to the certification effort as well as capture lessons learned so we can enhance competition for launch services. I strongly support the Secretary's

initiative to review the certification process for potential efficiencies, while protecting mission assurance.

New Engine Development

Russian aggression in Ukraine is a cause for great international concern and created uncertainty with the Russian made RD-180 rocket engine that powers United Launch Alliance's Atlas V launch vehicle. While the RD-180 is a fine engine, uncertainty regarding its future availability highlighted the need to consider other options for assured access to space. The United States should not be reliant on another nation, particularly Russia, to assure our access to space. Upon the completion of an RD-180 Risk Mitigation Study directed by the Secretary of Defense, it became clear that a prolonged interruption would result in increased risk for our national security space posture due to unavoidable delays. We are collaborating with private partners to invest in industry solutions for U.S.-made rocket propulsion systems. We have developed a strategy to eliminate the use of the RD-180 and reintroduce competition for NSS launch. The strategy starts with investment in U.S. based rocket engine technology.

In December 2014, the FY15 National Defense Authorization Act approved $220 million for a new rocket propulsion system to help transition from the Russian RD-180. AFSPC fully supports domestic launch capabilities. However, we must maintain mission success and assured access to space for our NSS assets by ensuring this effort results in a launch system. With the FY15 congressional add, we plan to invest in the first two steps of a four step process to attain domestic, commercially viable launch system providers. The initial investment of roughly $60 million will go towards improving U.S. hydrocarbon boost capability with NASA, national labs, universities and industry. The remaining FY15 funds will be used to start the investment in the development of rocket propulsion systems. Starting with the funds in the FY16 budget, we

intend to expand the investment into the corresponding launch systems, leveraging investments in Rocket Propulsion Systems started with the FY15 funds. Finally, we will onramp the launch providers, in which we invested and once certified, to achieve price competition. The ultimate goal is to have at least two domestic, commercially viable launch system providers that also meet all of our nation's NSS launch requirements. A sustained focus on rocket propulsion technology and the required launch systems allows the United States to operate in a broader trade space, helping to mitigate disruptive events affecting external supply lines. Also, launch systems with domestic engines will revitalize the launch and rocket propulsion industrial base, end reliance on a foreign supplier and aid the competitive outlook for the entire domestic launch industry. This will be a multi-year effort and require significant congressional support to maintain adequate funding in future years, particularly since this effort will require propulsion system integration.

Savings through Block Buys

Building on successful block buy acquisitions by the Advanced Extremely High Frequency (AEHF) and Evolved Expendable Launch Vehicle (EELV) teams in 2013, the Remote Sensing Systems Directorate negotiated a $2 billion satellite production contract to support the acquisition of two new Space-Based Infrared Systems (SBIRS) missile warning satellites. The SBIRS production and contracting team employed critical skills to negotiate and award the contract in June 2014. By leveraging OSD Better Buying Power initiatives and using a block buy strategy, the program office saved $1 billion compared to the OSD estimates, with an overall "should cost" savings of $591 million. These two new satellites are scheduled for delivery in September 2020 and July 2021, ensuring continuity of the Nation's critical missile warning capability.

Space Situational Awareness

Assured access is a priority, however, space situational awareness (SSA) underpins all we do in space from launch to disposal and supports the protection of critical space assets upon which our national leadership, warfighters and civil and commercial space operators depend. We have developed a foundational SSA architecture that will afford the best mix of near earth and deep space sensors, providing quality information to decision makers. While we are routinely tracking some 23,000 objects at the Joint Space Operations Center (JSpOC), our sensors are unable to detect and reliably track what we project to be more than 500,000 man-made objects in orbit today. Currently SSA sensors are tracking where we think objects should be. Space domain awareness is the next evolution, facilitated by the JSpOC Mission System (JMS), and will allow us to know where objects are, when they move unexpectedly, and provide the data for the Commander, Joint Functional Component Command for Space (JFCC-Space) and his forces to respond appropriately.

Joint Space Operations Center (JSpOC) Mission System (JMS)

JMS will provide persistent net-centric delivery of SSA and command and control services to other JFCCs, Joint Task Forces, the Intelligence Community, and SSA data sharing partners. In November 2014, the JMS Program team was successful in providing the requisite capability for the Fourteenth Air Force Commander, Lieutenant General Jay Raymond, to declare operational acceptance of JMS Service Pack 7 for use in the JSpOC; including a $1.1 million upgrade of all computers on the Air and Space Operations Center floor. This iteration of JMS lays the groundwork for the next step of the system's evolution – Service Pack 9, which will operationally transition the Space Catalog to JMS.

JMS is a mission system with an open architecture and a high performance computing environment, designed to give our operators a modern capability to integrate SSA data allowing for predictive awareness, timely threat assessment and mitigation towards true command and control of space forces. For today's warfighter, timely, accurate and actionable information is critical. JMS is laying the foundation, both for improved information architecture and foundational SSA capabilities with Increments 1 and 2. We must continue to drive forward toward Increment 3 and beyond in order to see this vision realized with the threat processing, decision support and enhanced command and control capabilities that include multi classification data fusion.

Geosynchronous Space Situational Awareness Program (GSSAP)/ Space Based Space Surveillance System (SBSS)

AFSPC is continually looking to improve our SSA posture. The first two GSSAP satellites successfully launched in July 2014 are going through checkout. Once complete, the constellation will revolutionize space-based space surveillance operations. It will give us the capability to perform persistent monitoring and neighborhood watch capability in geosynchronous Earth orbit (GEO).

Furthermore, its low Earth orbit (LEO) based predecessor, SBSS celebrated its fourth anniversary on orbit while continuing its tremendous contribution to the Space Surveillance Network.

Operationally Responsive Space (ORS) & SBSS Follow-On

The Air Force is committed to the ORS program office. We are working to launch ORS-4, which will be the first flight demonstration of a rail launcher delivering payloads to orbit. Using a rail launcher allows for a simpler rocket that is spin stabilized instead of using moveable

nozzles on the first stage motor. We are also supporting USSTRATCOM's urgent need for SSA with ORS-5, expected to launch in FY17, and ultimately SBSS Follow-On. ORS-5 started off well in 2014, successfully accomplishing a systems requirements review and one of three prototypes in the program. Additionally, the program office released a draft request for proposal for launch services. This program is a risk-reduction pathfinder to the SBSS Follow-on program.

We feel SBSS Follow-on can significantly benefit from the rapid acquisition and streamlined approach of ORS. It addresses critical USSTRATCOM needs for tracking high interest objects in multiple orbital regimes (GEO, medium Earth orbit (MEO) and HEO), with an emphasis on GEO. The program will meet all requirements, such as frequent revisit rates, better custody of space objects, more detailed event detection (including breakups and separations), as well as identifying emerging threats. While the space based sensors give us the ability to maintain custody and provide re-visit, there is still a need to discover and track smaller and more static objects while maintaining awareness on the larger population.

Space Fence

Another future contributor to the SSA mission is the Space Fence. This ground sensor will replace the already retired Air Force Space Surveillance System and is expected to greatly increase our ability to understand the battlespace and inform warfighter decisions. The increased Space Fence sensitivity, coupled with the increased computing capabilities of JMS, will yield a greater understanding of the space operating environment and associated threats while increasing our knowledge on over one-hundred thousand objects – including debris, active and inactive satellites, and the international space station. The uncued nature of the Space Fence will greatly increase the opportunity to discover satellite breakups, collisions, or unexpected satellite

maneuvers. The Air Force awarded the Space Fence contract to Lockheed Martin in June 2014, with a current projected initial operating capability in the second quarter of FY19.

The Space Fence will be the most significant improvement in near Earth SSA capability in nearly 50 years. It will work in conjunction with the JSpOC and the rest of the Space Surveillance Network to provide an integrated picture of the space operating environment for the warfighter. The delivery of the Kwajalein radar in 2019 will give JFCC-Space nearly complete coverage for detection of near Earth objects as well as improved ability to detect unforeseen or unannounced space events. The Space Fence will not solve all the near Earth needs alone, but will operate in conjunction with the legacy missile warning radars and other space surveillance network sensors.

Better Ways of Doing Business

AFSPC is operating on a budget of $2 billion less than we had two years ago, yet we continue to deliver foundational space capabilities. However, given the current fiscal and operational environment, we cannot simply maintain the status quo. When addressing the question of capability versus affordability, the first requirement is to develop resilient warfighting architectures in space to operate through any degraded environment. After that, we must work within our current budget to ensure the highest level of capability at an affordable and sustainable price.

Budget constraints are forcing us to review our existing space architectures and identify what we need to change in order to improve resiliency, flexibility and affordability. As we look at how we transition to these new architectures, we must take advantage of the opportunities presented by this new environment in the space enterprise while preserving the successes of the past. We have initiated studies to examine several configurations of lower cost satellites,

multiple spacecraft launched on a single booster and reducing the operations footprint through automation. This means looking at every constellation with resiliency and affordability in mind while not losing sight of our responsibility to define requirements correctly from inception.

Resilient Space Systems

Without exception, the first requirement is resilient warfighting architectures in space to operate through any degraded environment. We need a resilient space architecture that can fight through any threat in order to deter potential adversaries and preserve critical space capabilities for the warfighter. There are several methods to consider in achieving resilient space architecture. We're exploring disaggregation, hosted payloads, on-board satellite protection, defensive operations and leveraging commercial capabilities as possible ways to increase overall resiliency. Resiliency includes integrated real-time intelligence through enhanced SSA systems being shared internal to the government and with partner nations. Resilient architectures also include new technologies for enhanced survivability in order to give future operators options to dynamically respond to threats.

Benefiting resiliency, disaggregation is one concept of significant interest as we build future capabilities. Disaggregation is the dispersal of capability across multiple platforms to improve survivability. It complicates an adversary's targeting calculus and increases deterrence by providing a more survivable system solution. Improving the number and diversity of platforms has value regardless of whether the threat is hostile or a naturally occurring phenomenon such as orbital debris impact or satellite failure. Strategic and tactical protected satellite communications, currently provided by large, dedicated satellites such as Milstar and the AEHF constellations, could be separated and placed on smaller platforms as a hosted payload. For space-based sensors, such as SBIRS, the scanning and staring sensors could be flown on

different platforms assuming technology continues to develop as predicted. Finally, it is very likely that the smaller satellite theme will be carried over into the weather system follow-on program.

While disaggregation may help attain resiliency and keep costs down, it is important to remember it is not an all-inclusive answer nor appropriate for all mission areas. Therefore, with every mission area, we will bring forth an answer that incorporates disaggregation along with other capabilities to obtain the resilient capability we need in the future. Ultimately, we do not want to be in a position where the disruption or elimination of one satellite denies our forces the advantages of the warfighting capabilities derived from space. AFSPC completed a broad look into how a disaggregated architecture may affect the space launch enterprise in October 2014. The results of this effort will be incorporated into the Command's continued analysis of the operational and financial impacts related to disaggregation.

Another method of disaggregation is utilizing hosted payloads to provide resilient, affordable military space capabilities in an increasingly contested, congested and competitive space environment. The Air Force will use hosted payloads when it is architecturally feasible to lower cost and still deliver the capability. Hosted payloads can increase the Government's access to space and add resilience to U.S. military space systems through disaggregation, while reducing cost and improving schedule. Consequently, SMC has established a hosted payload office dedicated to examining the efficacy of this concept as an alternative to our current approach to satellites. In 2014, SMC awarded an indefinite-delivery-indefinite-quantity (IDIQ) contract under the Hosted Payload Solutions (HoPS) program. The multiple-award HoPS IDIQ contract provides a rapid and flexible means for the Government to acquire commercial hosting capabilities for government payloads. Award of the HoPS contracts created a pool of qualified

vendors and provides flexibility for up to six hosted payloads. Ultimately, the goal will be to create a streamlined and reproducible procurement vehicle to secure affordable and resilient access to space.

Confronting Budget Challenges

Although resiliency and disaggregation can help with certain aspects of our space budget, our portfolios are shrinking across the command. After making difficult decisions as a result of significant cuts to the Command's Operations and Maintenance (O&M) accounts in FY13, we greatly welcomed the short-term budget relief and flexibility represented in the FY14 and FY15 budgets. The relief provided some measure of recovery from FY13 and enabled our Airmen to make significant accomplishments in 2014 in support of the joint warfighter. I support the President's FY16 budget to help ensure we can sustain these critical space capabilities.

The President, the Secretary of Defense and the Chairman of the Joint Chiefs have all acknowledged the importance of space and cyberspace, but the fact remains there will be incredible competing priorities within the Department. With our Nation's increasing dependence on space and cyberspace, we must adjust to this new normal by challenging the status quo to meet growing demands in these two domains with innovation and dedication. We will scrutinize every contract to squeeze out as much value as we can, examine our acquisition process, and encourage competition at every possible avenue.

Impact of Sequestration

Should we return to funding levels as directed by the Budget Control Act (BCA) of 2011 and its mechanism of sequestration, AFSPC will have a difficult time meeting its operational requirements for the space and cyberspace systems in place today. Additionally, it has the

potential to reverse gains we made in FY14 and FY15 addressing infrastructure and range maintenance, readiness and modernization.

Sequestration's impact on the Launch Test Range System could mean reduced launch time on the ranges or a reduction in the number and types of assets available to range users, thus reducing redundant capabilities to a minimum and significantly increasing launch on time risks. These reductions would make range assets unavailable to the warfighter and it is important to note, similar actions in FY13 led to a multi-day launch slip.

Within the investment portfolio, sequestration threatens FY16 competitive launch opportunities. Programs such as SBIRS 5-6, AEHF 5-6 and Space Fence will incur significant cost impacts if program offices cannot meet contractual funding requirements due to fixed price contracts. A funding shortfall will make it necessary to renegotiate contracts resulting in cost increases and delays.

Additionally, sequestration will impact facility sustainment, restoration and modernization programs resulting in deferral of critically needed facilities and infrastructure maintenance and repair projects. For example, the range communications facility at Cape Canaveral Air Force Station is a 58-year-old structurally compromised facility prone to severe flooding creating mission risk for eastern range launch operations and putting recent equipment upgrades at risk. The FY16 funding request for Military Construction includes $21 million for the construction of a new, state of the art, multi-level facility to accommodate modern communications equipment. With congressional support, the construction of a new range communications facility will not only reduce energy and maintenance costs, but also increase safe execution of spacelift operations for all organizations launching out of the eastern range.

Conclusion

Space and cyberspace have not only become ubiquitous in our daily life, but have fundamentally changed how we fight and win wars. The integration of these domains will prove to be our success or failure. Therefore we must ensure unfettered delivery of these effects; effects from systems such as satellite communications, missile warning, position, navigation and timing, environmental sensing and supporting ground architecture. Given today's budget reality and looking forward, we will continue to work harder and smarter to meet warfighter demands while developing resilient warfighting architectures in space and cyberspace to operate through any degraded environment. We have overcome the challenges of the past with the ingenuity and dedication our Airmen are known for and stand ready to meet the future with the same commitment.

I look forward to working with Congress and this Subcommittee to keep you abreast of our efforts to provide resilient, capable and affordable space and cyberspace capabilities for the joint force and the Nation. Thank you for the opportunity to appear before this Subcommittee and for your continued support of AFSPC and our talented Airmen.