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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 2015 National Defense Authorization Budget Request for National Security Space Activities

STATEMENT OF: General William L. Shelton
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Introduction

Chairman Udall, Senator Sessions and distinguished Members of the Subcommittee, it is an honor to appear before you once again as the Commander of Air Force Space Command (AFSPC). As the Air Force space and cyberspace lead, I am responsible for organizing, training and equipping more than 40,000 military and civilian employees to provide Air Force space and cyberspace capabilities for the Combatant Commands and for the Nation. My team works hard to deliver these capabilities around the world, every hour, every day.

Space and cyberspace capabilities are foundational to the Joint Force Commander's ability to deter aggression and to execute global operations across the entire range of military operations, from humanitarian and disaster relief through major combat operations. Our military satellites and computer networks are technological marvels, providing mission-critical global access, persistence, and awareness. These systems not only provide essential, game-changing capabilities for our joint forces, they are increasingly vital assets for the global community and world economy.

Specifically in space, our sustained mission success integrating these capabilities into our military operations has encouraged potential adversaries to further develop counterspace technologies and attempt to exploit our systems and information. Therefore, I believe we are at a strategic crossroad in space. With the threats to our space systems increasing and defense budget uncertainty, the status quo is no longer a viable option. This "new normal" in space requires us to address protection of mission-critical systems, challenge traditional acquisition practices, and analyze new operational constructs.

The grand challenge before us is to assure essential space services will be available at the time and place of our choosing, while simultaneously lowering the cost of executing these missions. Finally, the budget situation of the last year certainly reminded us that our ability to provide these services now and into the future is fragile.

<u>Mandate for Change: Future Space Capabilities at a Strategic Crossroad</u>

The space environment has fundamentally changed since our fledgling efforts in the late-1950s and early 1960s. Our space systems were designed to operate in a relatively benign environment, and the detente between the United States and the Soviet Union kept the peace--even in space. There were few space-faring nations, and even fewer with indigenous launch capability. Today, there are more than 170 nations with some form of financial interest in a variety of satellites, and 11 nations that can independently launch satellites into space. The rapid expansion in space traffic over the past 50+ years occurred largely without conflict, but that era is coming to an end.

The joint force dependence on space assets yields a corresponding vulnerability we know others seek to exploit. Counterspace developments by potential adversaries are varied and include everything from jamming to kinetic kill anti-satellite weapons. Global Positioning System (GPS) jammers are widely available, complicating our employment of GPS navigation and timing signals in weapons and platforms. Satellite communications jammers are also available, which may challenge over-the-horizon communications when needed most. Also, some nations have developed and successfully demonstrated anti-satellite weapon capabilities which could threaten our satellites in times of conflict. Unfortunately, all projections indicate these threatening capabilities will become more robust and proliferated, and they will be operational on a shorter than predicted timeline.

In addition to adversarial counterspace programs, the growing debris problem is also a concern to spacecraft operators in all space sectors: military, civil and commercial. 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 objects smaller than 10 centimeters. And our models project more than 500,000 man-made objects greater in size than one centimeter in orbit today--many of these small objects represent a potentially catastrophic risk to fragile-by-design spacecraft.

We are also addressing the President's direction to support the National Broadband Plan by finding balance between assured access, spectrum sharing and reallocation/repurposing. Use of radio spectrum for ground-space communications must be protected from both a regulatory perspective and from targeted adversary action.

With the rapidly expanding adversary threats to our spacecraft, the growing debris population and decreasing budgets, we must adapt our satellite constellation architectures to become more resilient, while simultaneously making them more affordable. Just as combat aircraft necessarily evolved with the threat, we can no longer expect satellites built for a permissive environment to operate effectively in an increasingly contested space domain.

Due to the cost of launching satellites, our design philosophy has been to maximize the functionality on a given satellite, which translates to increased weight, size and corresponding cost. As a result, we build just enough satellites, just in time, to sustain our constellations. This philosophy worked well over the years, but in the new normal of space, we are vulnerable to the cheap shot or to premature failure. For example, loss of a single satellite in our missile warning or our protected communications constellations would potentially leave large gaps in a vital capability. We must consider different architecture options that will provide adequate and resilient capability at an affordable cost. Our die is cast through the mid-2020s with the outstanding satellites we are buying and successfully placing on orbit to support national security objectives and joint operations. Because of lengthy acquisition timelines, to affect these architectures in the post-2025 timeframe, we need to complete ongoing studies soon to determine the most efficient approach for the future.

Confronting Budget Challenges

Based on available funding, we made difficult decisions in the Command to survive Fiscal Year (FY) 13. The Budget Control Act of 2011 resulted in significant FY13 cuts to the Operations and Maintenance (O&M) budget at Air Force Space Command, which in turn compelled irreversible changes and significant risk to space operations going into FY14. The welcome relief and flexibility provided by the FY14 Appropriations Act is sustained in the FY15 President's Budget—our space operations budget requires this level of support to maintain our current operational posture and manage risk in changing operating conditions.

Impact of Sequestration

Despite our cost reduction efforts, last year's sequestration cuts required drastic actions at AFSPC. We cut $304.8 million from our O&M budget for FY14 alone to comply with the Budget Control Act. Achieving that magnitude of reductions required continued civilian workforce pay freezes, a 25 percent reduction of contractor services within my headquarters (on top of a 50 percent reduction the year before), inactivation of some operational capabilities, and most notably $100 million of additional risk in Weapon System Sustainment funding. This means that in FY15, vital sustainment activities are delayed or deferred, which could translate into system outages of increased duration or severity. Additionally, AFSPC uses a significant portion of our O&M budget to fund mission-essential contractor operators for our space and cyberspace missions--there is no flexibility here. Our search for savings over the last several years of declining budgets virtually eliminated any margin in O&M; therefore, the cuts began to erode these contracts which are essential to perform and sustain our mission.

While the Bipartisan Budget Act of 2013 alleviates a portion of the cuts we were facing in FY14 and FY15, we remain concerned that continued sequestration-induced budget cuts in FY16 and beyond, as well as overall funding instability, could undermine our space capability for years to come.

Challenging Legacy Space Architectures and Traditional Acquisition Practices

This past year, we continued success in our acquisition programs to provide greater mission assurance and cost savings. As we transition from development to production, we have captured success through lean processing, smart testing and appropriate oversight and reporting. The Space and Missile Systems Center (SMC) made tremendous strides implementing "should-cost" initiatives that resulted in real program savings of more than $1.4 billion across the Future Years Defense Program. The result of these actions can be seen in streamlined assembly, testing and delivery of a number of programs to include Advanced Extremely High Frequency (AEHF), Space-Based Infrared System (SBIRS), Wideband Global Satellite Communications (WGS) and GPS III.

Space Modernization Initiative (SMI)

In 2011, AFSPC adopted the Efficient Space Procurement (ESP) concept to reduce procurement risk and lower overall cost by transitioning from buying satellites one-at-a-time to buying satellites in blocks using fixed price contracts. This approach allowed us to take advantage of economic order quantities and the efficiencies inherent in a stable production line. We then used a portion of these savings to invest back into mission areas under SMI. The overall SMI strategy is to invest in program efforts that create increased trade space for future decisions. Study contracts under SMI are helping us better plan for a challenging future by exploring affordable technology alternatives and architectures in missile warning, communications, global positioning, navigation and timing mission areas.

SMI-funded studies position AFSPC to take advantage of opportunities such as greater commercial satellite availability, a competitive medium launch market and faster commercial production cycles. SMI also postures the Air Force to rapidly address emerging kinetic and non-kinetic threats. These investments are critical to our ability to define future options to increase resiliency in this dynamic operational space environment.

Resilient Architectures

As we work toward increased resiliency and affordability, we are examining a range of options, one of which is disaggregation. Disaggregation concepts call for the dispersion of space-based missions, functions or sensors across multiple systems or platforms. By separating payloads on different satellites we will complicate a potential adversary's targeting calculus, decrease size and system complexity, and enable use of smaller boosters--with the goal of simultaneously driving down cost.

In addition, we are evaluating constructs to host payloads on other platforms where feasible, and take better advantage of available commercial services. The trailblazing Commercial Hosted Infrared Payload program, a government infrared payload on a commercial satellite, was a technical success by any measure, and we learned significant lessons on the overall hosted payload concept.

Over the past several months, we've met with more than 65 space companies to seek their ideas on alternative architectures. From those meetings, we collected many concepts that will inform our Analyses of Alternatives (AoA) for the future of protected military satellite communications and overhead persistent infrared systems. In addition, the Missile Defense Agency (MDA) is supporting our AoA studies with threat definition, technical evaluations and cost analysis support. AFSPC and MDA are collaborating on future space sensor architecture studies and sensor performance assessments across a broad set of joint mission areas. Finally, Federally Funded Research and Development Centers, as well as others, will complete studies this year on disaggregation and its secondary impacts on the launch industry and space architectures.

Better Buying Power

As previously mentioned, our use of the ESP approach and the Department of Defense's (DoD) Better Buying Power concepts resulted in significant positive results. SMC, under the sterling leadership of Lieutenant General Ellen Pawlikowski, awarded a block buy contract for the AEHF space vehicles 5 and 6, obtaining $1.625 billion in savings from the original independent cost estimate. Also, we anticipate the award of a contract for two more SBIRS satellites later this year, taking advantage of lessons learned on AEHF 5 and 6. Despite parts obsolescence challenges that required initial nonrecurring engineering and advance procurement efforts, we will realize significant savings using a firm, fixed-price contract.

Space Capabilities for the Joint Warfighter

Space Situational Awareness (SSA)

SSA underpins everything we do in space. Gaining and maintaining awareness in space requires data from global sensors and the integration and exploitation of that data to support operational command and control (C2). The JSpOC Mission System (JMS) is integral to improving SSA and C2. JMS Increment 1 was approved for full deployment and operationally accepted last year. This increment delivered the net-centric framework and the initial capability advances toward better operator understanding and monitoring of the space environment. JMS Increment 2 will build on that foundation by fielding groundbreaking capabilities to include greatly improved capability to detect and characterize orbital hazards and adversary threats. Increment 2 will also enable the JSpOC to transition from the legacy Space Defense Operations Center system to expanded computational capacity and improved automation, thereby improving our ability to handle space events and allowing us to retire increasingly difficult to sustain hardware. Furthermore, it will allow integration of data from our network of space surveillance sensors, previously unavailable intelligence community data, and data from other commercial, allied and governmental sensors. The JMS program clearly represents game-changing capability for the Nation's space situational awareness.

Enhancements to the Space Surveillance Network are necessary to close sensing gaps and take full advantage of the JMS high performance computing environment. And international cooperative efforts are part of that effort. As an example, in November, 2013, Secretary Hagel and Australian Defense Minister Johnston signed a Memorandum of Understanding finalizing arrangements to move the Defense Advanced Research Projects Agency's Space Surveillance Telescope from its original site in New Mexico to a site in Western Australia. The high capacity and extremely accurate capabilities of this telescope will significantly enhance SSA in deep space. The telescope will be relocated and operational in 2016 to monitor geosynchronous orbits over the Pacific region. Similarly, we have reached an agreement to place a C-Band Radar in Australia to help with southern hemisphere SSA coverage.

Another big step forward is the new S-Band Radar, commonly known as the Space Fence. We will build this critical SSA sensor on Kwajalein Atoll, and remotely operate from Huntsville, AL. This radar will track much smaller objects and cover almost all orbital inclinations with a capacity to track many thousands of objects daily. Budget uncertainty contributed to a one year delay, but the contract should be awarded this Spring, with an initial operational capability date in FY19.

Our ground-based radars provide outstanding deep space tracking and space object identification capabilities, but they are not well-suited to search operations. Our ground-based optical systems are outstanding deep space search and tracking assets, but they can only perform their mission at night, and they must have clear skies to conduct imaging operations.

Based on the success of a sensor flown on a missile defense experimental satellite, in 2010 we developed and launched the Space-Based Space Surveillance (SBSS) satellite, with a 7-year design life, into low-earth orbit to augment both search and tracking of man-made objects. The follow-on program is being developed; however, it will not be launched until 2021 based on available funding. The result is a potential 4-year gap in this crucial space-based coverage, which will limit our ability to maintain timely custody of threats to our satellites in geosynchronous orbits. We have extended our network to include allied contributions to mitigate the potential loss of data. For example, the Canadian Sapphire satellite, launched in 2013, is a contributing sensor to our space surveillance efforts, but unfortunately, this satellite has a 5-year design life and is expected to be decommissioned about the same time as SBSS. We are working hard to extend the life of SBSS and other potential contributors to mitigate this potential coverage gap.

A future contributor to extend and enhance coverage is the Geosynchronous Space Situational Awareness Program (GSSAP). This system will collect SSA data allowing for more accurate tracking and characterization of man-made orbiting objects in a near-geosynchronous orbit. Data from GSSAP will contribute to timely and accurate orbital predictions, enhance our knowledge of the geosynchronous environment and further enable space flight safety to include satellite collision avoidance. GSSAP is expected to launch in 2014.

Assured Access to Space

It is essential that we sustain a reliable capability to launch national security satellites into space. To that end, we continued our unprecedented string of successful launches in 2013. Alongside our industry partner, United Launch Alliance, we executed an all-time high of 11 launches of the Evolved Expendable Launch Vehicle (EELV).

The commercial space launch industry made substantial progress last year with successful launches by Orbital Sciences and SpaceX. Our launch acquisition strategy aims to take advantage of the competition made possible by these new entrants once they are fully certified under the approved new entrant certification protocol. We have been very successful placing new satellites in orbit by placing a premium on mission assurance. As we move forward in an era of competition for launch services, we must remain focused on mission assurance to ensure national security payloads are safely and reliably delivered to space.

Our launch and range infrastructure has served the space enterprise well over the years, but the infrastructure overall is old and it requires considerable sustainment and modernization efforts. And due to the previously mentioned O&M budget shortfalls, we took action to right-size our infrastructure on both coasts and at our down-range sites. Our National Security Space Essential Range will not compromise public safety or mission assurance, but we will continue to balance sustainability and modernization to overcome obsolescence, as well as implementing better contract mechanisms to control costs.

Military Satellite Communications

2013 was a successful year for AFSPC military satellite communications as well. The Air Force launched the third AEHF satellite in September 2013, delivering increased capacity for survivable, secure, protected and jam-resistant satellite communication for strategic and tactical warfighters as well as our most senior national leadership and international partners. The Air Force also successfully launched the fifth and sixth WGS satellites within 76 days of each other. These satellites significantly increase high-capacity satellite communication to joint forces around the world.

The WGS program exemplifies the opportunities to leverage commercial satellite technologies to reduce the cost of providing space systems. However, we need to go further. At SMC, our program managers collaborated with industry to explore other possibilities. Through the use of broad area announcement solicitations, SMC awarded contracts to 17 vendors to examine concepts for secure satellite communications at a lower cost.

Position, Navigation and Timing (PNT)

By the end of 2013, we completed production of all 12 GPS IIF satellites. The fourth GPS IIF satellite was launched in 2013, and we plan to launch three satellites in 2014, three more satellites in 2015 and the final two GPS IIF satellites in 2016.

As has been widely reported, the navigation payload delivery for GPS III is delayed beyond the contracted date. Although we don’t believe this will result in any impact to our ability to provide gold standard PNT services to the world, we are concerned about the impact to the overall GPS III program. We are working remedies with the prime contractor for this delay.

We also expect the Next-Generation GPS Control Segment Block 1 to transition to operations in 2016. In November, we tested the system’s ability to command GPS Blocks II and III satellites using space system simulators, including control of the major PNT signals. This demonstration is a major step forward to prepare for the GPS III era of more secure and robust GPS signals to the warfighter.

Space-Based Infrared System

The SBIRS GEO-2 satellite was launched, delivered for operational trial period and operationally accepted in 2013. To date, the data provided by both SBIRS GEO-1 and GEO-2 satellites is outstanding, providing enhanced missile warning and battlespace awareness over critical portions of the world. SBIRS GEO-3 is planned to launch in 2016.

Terrestrial Environmental Monitoring

Defense Meteorological Satellite Program (DMSP) satellite number 19 will launch in April 2014 and we expect the satellite will remain operational well into the 2020s. We are concerned about potential gaps in meteorological coverage when current DoD, civilian, partner and allied meteorological satellites reach their end-of-life in the 2015-2025 timeframe. The Space-Based Environmental Monitoring AoA was conducted to study follow-on options, such as international partnerships, hosted payloads or a new satellite, for continued meteorological support to warfighters in the most cost-effective manner. The results from the AoA are currently being reviewed by the Joint Requirements Oversight Council.

Conclusion

The men and women of AFSPC remain committed to providing unsurpassed support to our warfighters and allies. Every day they bring innovation, excellence, and uncompromising focus to the Nation's space missions that are conducted 24/7 across the globe.

Our Nation's advantage in space is no longer a given. The ever-evolving space environment is increasingly contested as current and potential adversary capabilities grow in number and sophistication. Providing budget stability and flexibility in this very dynamic strategic environment is necessary to maintain and bolster the viability of all space capabilities.

I remain committed to a course of action that acknowledges and responds to uncertainty in this new normal. The status quo is not a viable alternative in response to the new normal. We are reaching out to our talented Airmen, industry partners, allies and Congress to make the changes necessary to provide required capability that is affordable and resilient.

I thank you for your support and look forward to working with Congress and this committee to keep you abreast of our efforts to provide resilient, capable and affordable space capabilities for the joint force and the Nation.