DEPARTMENT OF THE AIR FORCE

PRESENTATION TO THE SENATE ARMED SERVICES COMMITTEE

UNITED STATES SENATE

SUBCOMMITTEE ON STRATEGIC FORCES

SUBJECT: NATIONAL SECURITY SPACE POSTURE

STATEMENT OF: HONORABLE RONALD M. SEGA

UNDER SECRETARY OF THE AIR FORCE

April 19, 2007

INTRODUCTION

It is an honor to appear before this Committee as the Under Secretary of the Air Force and the Department of Defense (DoD) Executive Agent for Space, and discuss with you our National Security Space activities. As the DoD Executive Agent for Space, my role is to "develop, coordinate, and integrate plans and programs for space systems and the acquisition of DoD space Major Defense Acquisition Programs to provide operational space force capabilities to ensure the United States has the space power to achieve its national security objectives."

On August 31, 2006, the President signed a new National Space Policy, which highlights the importance of space to the nation and presents goals for our country's space activities. Today, I would like to discuss the importance of space to our warfighters; the progress that we have made over the last year; and some of our future plans for DoD space programs. One key tenet, which you will see throughout this testimony, is that we must ensure the continuity of service of several key capabilities, such as: Strategic Communications; Missile Warning; and Position, Navigation, and Timing. Last year, we presented three key areas of emphasis that remain the focus of our space activities: integration across national security space as well as with air, land, sea, and cyberspace; getting "Back to Basics" in our approach to space acquisition; and the importance of ensuring the viability and proficiency of our space professionals and Science and Engineering workforce. Over the last year, we have made progress in these three focus areas and are starting to see the benefits of this approach.

The U.S. relies upon space capabilities not only to meet the needs of Joint operations worldwide, but to support our nation's diplomatic, informational, and economic efforts as well. Because of this, it is important that National Security Space (NSS) and our space professionals are integrated into all aspects of peacetime and wartime operations--providing robust and responsive space capabilities around the globe. At the tactical level, space is also playing a crucial role; for example, during Search and Rescue missions, U.S. Air Force, Army, and some Navy personnel in theater are using Combat Survivor Evader Locator (CSEL) radios, incorporating GPS and satellite communications.

Government and commercial communications satellites are also providing direct support to our warfighting forces. Our most recent data shows commercial vendors are providing over 80% of the satellite communications (SATCOM) used in U.S. Central Command's Area of Responsibility (AOR). Though transparent to many, space capabilities continue to make a difference in Iraq, Afghanistan, and around the world.

America's citizens also rely on the access and use of space capabilities in many areas of everyday life. From our banks and financial institutions employing GPS timing to synchronize their encrypted computer networks to forecasting severe weather, America is increasingly dependent on capabilities from space. The space community continues to provide continuity of service in key areas, while simultaneously working to modernize and recapitalize our aging space fleet and infrastructure. Today, we do not have the luxury of "depots" to upgrade and maintain our space systems the way our air and ground forces do. Thus, in order to maintain

our space capabilities, we must replace the aging systems and upgrade with new systems.

Globally, the rate of change of technology in the 21st Century and the number of nations directly engaged in space continues to increase. The capacity to contest space operations and capabilities is also growing. Space can no longer be considered a "safe haven" or "sanctuary." The recent foreign testing of a kinetic anti-satellite (ASAT) weapon demonstrated an ability to challenge, disrupt, or destroy space assets and capabilities. This testing has also raised global concerns over space debris and this debris' potential to collide with space assets in, or traversing through, Low Earth Orbit. Thus, space situational awareness (SSA) has become increasingly important, enabling us to gain a better understanding of activity in space; and we must continue to work on protection for our space capabilities in a potentially hostile environment.

We must also continue to emphasize integration, "Back to Basics" acquisition and workforce development. Before updating you on these three initiatives, I want to share some progress the NSS community has made over the last year.

UPDATE ON SPACE

In addition to implementing "Back to Basics" reforms, several achievements occurred across the DoD space portfolio over the last year.

LAUNCH

On March 8, 2007, we accomplished our 50th consecutive, successful National Security Space operational launch--a national record. This event was also the fifteenth successful operational launch of an EELV booster. We need to remember,

however, that this remarkable achievement is only possible due to our continuing commitment to Mission Assurance, and exacting attention to detail.

MISSILE WARNING

Over the last year, we also made significant progress on the Space Based Infrared System (SBIRS) program, which supports four mission areas: missile warning, missile defense, technical intelligence, and battlespace awareness. The first Highly Elliptical Orbit (HEO-1) SBIRS payload was successfully launched last year, and it has met or exceeded all on-orbit performance expectations. Several key tests were also conducted on the first SBIRS Geosynchronous Earth Orbit (GEO-1) payload and spacecraft, in preparation for launch in 2008. Our funding request allows the procurement of the first two GEO spacecraft plus the necessary long lead items for a potential third GEO spacecraft, two additional hosted SBIRS sensors in Highly Elliptical Orbit (HEO), plus the necessary ground elements.

COMMUNICATIONS

We are moving ahead with near-term improvements to our satellite communication capabilities. The first Wideband Global SATCOM (WGS) space vehicle (SV) completed final assembly and integration and most of the system level testing required in preparation for launch, projected for summer 2007. In February 2006, the Air Force awarded a contract for the second block (Block II) of WGS satellites (SVs 4-5), with even higher bandwidth/throughput than the Block I satellites (SVs 1-3). The Advanced Extremely High Frequency (AEHF) program, the follow-on to MILSTAR, successfully completed its first end-to-end communication test with legacy MILSTAR terminals in June 2006, and is on track for first launch in 2008. Also,

the Transformational Satellite Communications (TSAT) program continued to mature key technologies with both contractors passing independent evaluations.

POSITION, NAVIGATION, AND TIMING

Two GPS IIR-M satellites were successfully launched in 2006, bringing us to three GPS IIR-M's now on orbit. These satellites provide a new military signal (M-Code), which is more resistant to jamming, and a new civil signal (L2C). After the remaining five GPS IIR-M satellites are launched, we will begin to launch the GPS IIF series of twelve satellites, which are all now under contract, following a thorough Integrated Baseline Review last year.

OPERATIONALLY RESPONSIVE SPACE

In 2006, the Air Force established the new Space Development and Test Wing, headquartered at Kirtland AFB, New Mexico, located next to the Air Force Research Lab's Space Vehicles Directorate, to focus on the development and testing of smaller satellites/orbital assets, with the goal of increasing innovation and speed, to rapidly transition ideas to fielded capabilities. One of the Wing's key responsibilities is support of the "Operationally Responsive Space" (ORS) effort. This ORS focus includes the ability to launch, activate and employ low-cost, militarily useful satellites to provide surge capability, reconstitute or augment existing constellations, or provide timely availability of tailored or new capabilities.

INTEGRATION

We continue to emphasize integration and collaboration across the national security space community; across functional areas such as Intelligence, Surveillance, and Reconnaissance (ISR); and among DoD entities, other government agencies,

industry, academia, and Congress. Integrating architectures also become increasingly important as systems become more capable of dynamic tasking and mutual cueing, and protection of our space capabilities become even more important.

Last year, the Air Force and the National Reconnaissance Office (NRO) signed an agreement, which established new personnel policies and mechanisms for better developing and managing Air Force space professionals. Subsequently, an Air Force Major General was assigned as the Deputy Director of the NRO, while retaining Program Executive Officer (PEO) responsibilities for Space Radar under the Air Force Acquisition Executive for Space. A new NRO position was also established, as the Deputy Director of Air, Space, and Information Operations at Air Force Space Command.

The Space Partnership Council, with membership from organizations across the national security and civil space communities, is helping to share best practices, avoid duplication, and support integration of space activities. For example, last year we agreed to establish a GPS Metric Tracking requirement for launches from both the Eastern and Western launch ranges beginning January 1, 2011.

Additionally, on July 19, 2006, U.S. Strategic Command announced the establishment of the Joint Functional Component Command for Space (JFCC SPACE), headed by the Fourteenth Air Force Commander at Vandenberg AFB. This action provides a single commander, with a global perspective, enhancing functional integration for the command and control of the nation's space-based assets.

Our acquisition approach also emphasizes integration and collaboration among interested parties in all stages of the acquisition process. Our goal is to create

partnerships within the space community, which are critical to this community's success. The military should provide well-coordinated requirements, vetted through operators, acquirers, and logisticians. The government acquisition community, working with industry, must assure that technology is mature and that systems engineering and manufacturing capabilities are in place to deliver requirements--on cost and on schedule--with appropriate funding stability. A military-industry-congressional partnership is also essential.

Over the last year, we have facilitated collaboration between Air Force product centers and laboratories with the establishment of the Space and Missile Systems Center's (SMC's) Space Development and Test Wing, located just across the street from the Space Vehicles Laboratory on Kirtland AFB, New Mexico, as mentioned previously. Additionally, one recent collaborative effort involved the Air Force, Army, Navy, and NASA working closely to develop and launch the "TacSat" Experimental Satellite (TacSat-2) last December from the NASA facility on Wallops Island, Virginia.

"BACK TO BASICS" IN SPACE ACQUISITION

We continue to refine and implement the "Back to Basics" initiative that we discussed last year, and it remains a key element of our plan to improve space acquisition. This initiative promotes a renewed emphasis on increased discipline in the development and stabilization of requirements and resources; engineering practices; and management, as well as a more deliberate acquisition planning strategy. We have established a goal of funding to a cost estimate at the 80% confidence level, to help ensure space program success.

This "Back to Basics" approach focuses on "mission success" in our space acquisition programs. "Acquisition" links technology with operations--turning ideas into real, tangible items and delivering those items to the field. It can be viewed as a continuous process with four distinct but interrelated stages. The first stage is Science and Technology (S&T), where we conduct basic research and explore the possibilities of new technologies. In the second, Technology Development, we evaluate the utility of discoveries made in the S&T stage. The third stage is Systems Development. Here, we take the most promising technologies and mature them to higher readiness levels so they can be integrated into operational platforms in the fourth stage, System Production. Thus, technology is matured through the four stages to move from the lab bench, to the test range, to operations. We are emphasizing early technology development to ensure mature technology is available for our production systems.

For most space systems, the "Back to Basics" approach will be implemented using a block approach acquisition strategy that is focused on delivering capability through discrete, value-added increments. This concept is consistent with current policy specifying "evolutionary acquisition as the preferred strategy" for DoD acquisitions. Specific capability increments are based on a balance of capability, delivery timeline, technology maturity, risk, and budget. Well-defined increments help reduce many of the potential instabilities in requirements, budget, and workforce. An overarching goal is increased confidence, both in terms cost and schedule, for our space acquisition programs.

Though "Back to Basics" is not a quick-fix solution to space acquisition, we have begun to realize the benefits of using this approach. Adhering to its key

principles (e.g., systems engineering; proper management of requirements, risks, and resources) yields dividends, but this is a continuing process that requires our continued commitment. In the FY07 President's Budget Request, the Air Force applied the block approach to the TSAT program, which is critical to maintaining continuity of service in Strategic Communications. The "Back to Basics" philosophy and block approach are also now being applied to several other needed capabilities: Missile Warning systems (e.g., SBIRS and the Alternative Infrared Satellite System (AIRSS)); Space Situational Awareness (e.g., Space Based Surveillance System (SBSS)); and Position, Navigation, and Timing (e.g., GPS III). Thus, programs with defined, executable block strategies should reduce production risk, deliver incremental capabilities to the warfighter sooner, and maintain continuity of service.

MISSILE WARNING

Space-based infrared sensing capability (e.g., missile warning, missile defense, technical intelligence, and battlespace characterization) remains a critical requirement. In addition to the current SBIRS-High program previously mentioned, we are working on an Alternative Infrared Satellite System (AIRSS). AIRSS is a critical program for developing a range of options to ensure the nation's missile warning capability is both sustainable and responsive. AIRSS is developing Wide Field-of-View (WFOV) focal plane array-based options for the "SBIRS-type" missions. The technical progress on the basic elements of this program would provide confidence that a near term WFOV option could be made available and, with further development of this technology, could reduce cost and improve performance for the next generation missile warning system after SBIRS-High.

Ensuring technology maturation occurs before transitioning from development to production is a key part of the “Back to Basics” philosophy. Entering a system production phase with mature technology reduces schedule and cost risk, puts needed capability into the warfighters’ hands sooner, and ensures we deliver what we promise on schedule, supporting continuity of service. Each operational capability area, such as missile warning, should have an investment strategy and portfolio that goes beyond the current program of record, to include needed work to support successive generations of technical capability, both for space and ground elements.

COMMUNICATIONS

Last year, we also applied the “Back to Basics” approach to Strategic Communications programs, particularly for the Transformational Communications Architecture (TCA) and the TSAT program. The TCA supports interoperability through the use of community standards and is comprised of four segments: space vehicles, terminals, terrestrial infrastructure, and network management & operations.

TSAT will provide internet protocol-based communications with laser crosslinks in space, and extend the Global Information Grid to deployed and mobile users, providing internet-like connectivity. The first TSAT satellite launch is now scheduled for 2016, which will maintain continuity of communications support to strategic users and meet the warfighters’ needs during the transition to net-centric operations.

POSITION, NAVIGATION, AND TIMING

Continuity of Position, Navigation, and Timing (PNT) capability is critical for military, civil, and commercial applications, and GPS is the world’s standard for space-based PNT. Using GPS, military and civilian users can access highly accurate, real-

time, all-weather, position, navigation, and timing data--24 hours a day, 7 days a week. Assured GPS capability is crucial to the success of many missions, from humanitarian relief to weapons employment, and the Air Force is committed to continuity of this critical service. To that end, we will continue to make improvements to the constellation; including new civil signals, more jam-resistant military code, new receivers, and increased accuracy. In 2006, interagency coordination was strengthened through an active National PNT Executive Committee (EXCOM), co-chaired by the Deputy Secretary of Defense and the Deputy Secretary of Transportation, and the stand-up of the National PNT Coordinating Office.

The Air Force is meeting the warfighters' PNT needs through increased power and signal improvements to eight GPS IIR-M satellites (three on orbit and five awaiting launch), twelve GPS IIF satellites, their ground control system, and associated user equipment. Together, these actions will deliver higher power and improved anti-jam capability. At the same time, the Air Force is developing the GPS III satellites to continue to satisfy warfighter requirements in the future.

Through a comprehensive review process and Joint Requirements Oversight Council (JROC) validation, GPS III requirements were developed, and include: increased power beyond GPS IIF, an L1C signal, enhanced crosslinks, and spot beam capability. These capabilities will enhance our current GPS capability, and we plan to deliver these capabilities incrementally. The first block, GPS IIIA, will incorporate GPS IIF capabilities plus a tenfold increase in signal power, a new L1C civil signal compatible with Galileo, and a growth path to future blocks. GPS IIIB will then incorporate enhanced crosslinks capability, and GPS IIIC will provide spot beam

capability. In the case of GPS IIIA, we will carry both contractors through Key Decision Point B, so that we can leverage ongoing risk-reduction activities. The JROC validation of the GPS Block IIIA initial Capability Development Document addendum supports this block approach strategy for GPS III.

OPERATIONALLY RESPONSIVE SPACE

Operationally Responsive Space (ORS) also utilizes the "Back to Basics" approach. As defined in this year's Air Force Posture Statement, "ORS includes the ability to launch, activate and employ low-cost, militarily useful satellites to provide surge capability, reconstitute damaged or incapacitated satellites, or provide timely availability of tailored or new capabilities." A broader view of ORS is a tiered capability consisting of spacecraft, launch vehicles, and ground segment to deliver a range of space effects to the warfighter. Additionally, this broader view combines existing, ready-to-field, and emergent systems that are focused on reducing development and deployment costs and schedule. The FY08 funding request for the ORS program element (narrower, small-satellite construct) supports an increased ability to transition rapidly from experiment to operational capability.

Our first on orbit Tactical Satellite Experiment (TacSat-2) was successfully launched in December 2006, and two more experimental "TacSats" are planned for launch in 2007. The TacSat-2 satellite was developed quickly and cost effectively--carrying several experiments to test cutting-edge capabilities to support the warfighter. The TacSat-2 team demonstrated "responsive" capabilities by efficiently integrating the satellite and launching on a Minotaur booster (Minuteman derivative) within seven months of ordering the booster.

SPACE SITUATIONAL AWARENESS

Space Situational Awareness (SSA) includes systems such as the Rapid Attack Identification Detection and Reporting System (RAIDRS) program, the Space Fence, and SBSS.

RAIDRS develops ground-based systems that rapidly detect, locate, characterize, identify, and report interference with DoD-owned and DoD-used space assets, and it is being developed via a block approach. Block 10 should provide initial capabilities in FY07 that detect and geo-locate satellite communications interference via fixed and mobile ground systems, whereas Block 20 is planned to provide automated data access/analysis, data fusion, and decision support capabilities.

The Space Fence is planned to replace the aging Air Force Space Surveillance System (AFSSS) with a system of three sites worldwide and use a higher radio frequency to detect and track smaller sized space objects. It would expand the terrestrial-based detection and tracking capability, supporting Space Situational Awareness while working in concert with other network sensors. A block approach acquisition strategy for the program will be developed in FY07-08 with a development contract to follow after a full and open competition.

Building upon the success of the Space-Based Visible (SBV) technology demonstration, the Space-Based Surveillance System (SBSS) program is planned to deliver optical sensing satellites to search, detect, and track objects in earth orbit, particularly those in geosynchronous orbit. Surveillance from space will augment our ground sensors with 24-hour, all-weather search capability. SBSS is also being acquired via a block approach, with Block 10 to be fielded in FY09 as a pathfinder

capability to replace the aging SBV sensor. Block 20 is then scheduled to provide increased worldwide space surveillance.

SPACE PROFESSIONALS / SCIENCE & ENGINEERING WORKFORCE

The foundation for our future space capability continues to be our space professionals in the military, civil service, and industry. Some of our experienced personnel will soon be eligible to retire, so we are working hard to attract and retain technically skilled people to ensure that the appropriate technical foundation and essential skill sets are available to accomplish our space missions. We are also working to develop better cross-functional assignment practices, to more effectively match individual competencies and experiences with position requirements.

The importance of space as a force multiplier underscores the necessity to ensure we have a strong industrial base that will be able to satisfy our requirements, both now and in the future. The Space Industrial Base Council (SIBC), co-chaired by Dr. Kerr and myself, is a forum to address space industry issues and bring together stakeholders from across government to provide coordinated attention and action on space industrial base issues. We have also taken steps to include industry and academia to help inform and implement our initiatives.

Our focus has been to ensure that our space cadre is comprised of the most highly qualified personnel possible. The National Security Space Institute (NSSI) continues to be a DoD Center of Excellence for Space Education and serves a diverse multiservice and governmental agency population. Student capacity for the NSSI's Space "200" and "300" courses has also been expanded and work has begun on development of an additional Advanced Course for Military Satellite Communications.

Additionally, the NSSI, Air Force Institute of Technology, Naval Postgraduate School, and other academic organizations continue to develop new Distance Learning courses, making coursework available to a larger audience, and allowing students to work and study simultaneously.

The significance of having a high-quality workforce will only grow as the global development of space expands. Just as the block approach provides a path for the development and maturity of technology, it also provides the opportunity to develop our future space leaders through experience gained with increasingly complex systems. For example, by allowing hands-on experiences with ORS and small satellites, our people are rapidly gaining critical skills in building, launching, and operating spacecraft. These efforts help develop technical instincts, which should prove valuable in our space professionals' future endeavors, such as program management.

The National Defense Education Program (NDEP) also continues to provide additional opportunities for scholarships in Math, Science, Engineering, and Foreign Language, with a focus on critical skills for clearable people. The NDEP was funded at $10M in FY06, $20M in FY07, and we are requesting $44M in FY08. We are working with our laboratories and product centers to help sponsor the students and we ask for your continued support.

CONCLUSION

Our Nation depends on its space capabilities as an integral part of its military power, industrial capability, and economic vitality. We must continue to ensure continuity of services in critical areas such as Missile Warning, Strategic

Communications, and Position, Navigation and Timing. We have continued to focus on: integration of America's space efforts; a "Back to Basics" approach to Space Acquisition; and a continuing emphasis on strengthening America's space professionals and our Science and Engineering workforce. Initial application of our strategy over the past year has shown promising results, as we continue toward securing our Nation's space capabilities for the future.

I look forward to continuing to work with the Committee and thank you for your continued support of National Security Space.