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

STATEMENT OF

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BEFORE THE HOUSE COMMITTEE
ON ARMED SERVICES
SUBCOMMITTEE ON STRATEGIC FORCES

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Introduction

Our current national security space systems and, to some degree, even those we are planning for in the near future have their origins in response to the requirements that existed in the Cold War stand-off with the then Soviet Union. For the first thirty years of the Space Age our systems were designed principally to respond to the threat of nuclear war with the USSR. The Defense Support Program, the Defense Satellite Communications System (DSCS), and Extremely-High Frequency Military Strategic and Tactical Relay (MILSTAR) satellite communications systems, as well as our overhead imagery and signals intelligence architectures, are prime examples of acquisitions that focused initially and almost exclusively on supporting the capability to monitor Soviet strategic and theater nuclear forces' developments and to warn of and respond to a large-scale Soviet ballistic missile attack. For much of this period, the two superpowers had exclusive access to space. Although the Soviet Union possessed an anti-satellite capability, the presumed circumstances of its use were seen in the context of a nuclear war; space was not considered a likely theater of conflict.

The space domain has changed significantly in fifty years. It has evolved from a scarcely populated, essentially uncontested destination to an almost certain theater of future combat operations. The environment has seen many types of activity proliferate: the number of spacefaring nations has risen increased dramatically since Sputnik; users of space systems and products have multiplied; space capabilities and activities have become enmeshed in the security and economic affairs of many nations. For the United States, Space has become pervasive in all aspects of our thinking about military operations and warfare – from major campaigns like Operation ENDURING FREEDOM to

smaller scale relief operations in response to humanitarian crises, such as Operation UNIFIED ASSISTANCE to aid tsunami victims. Our asymmetric advantage in space also creates asymmetric vulnerabilities. Our potential adversaries recognize our dependence on space and continue to develop and field a range of capabilities and means designed to deny our ability to use space.

This change in the environment has occurred concurrently with the steady recovery and improvement of our space acquisition programs and practices. Schedule delays have generally subsided and our costs have come under control. Air Force program managers and the Program Executive Officer for Space have been able to use the leverage provided by the Better Buying Power Initiatives, undertaken by the Under Secretary for Acquisition, Technology, and Logistics to generate significantly improved prices and real savings as the Government negotiates production contracts for several space systems. Finally, the performance of our new systems continues to meet and often exceed expectations.

Across the majority of our space "lines of business," systems in acquisition are transitioning from the development to the production stage. Though our production rates are minimal, as compared to virtually any other system or capability acquired by the Department of Defense, this transition reflects the Government maintaining a stable requirements baseline and both Government and our industry members capitalizing on shared and successful development and manufacturing-related technical risk reductions and mitigations.

Our progress and successes managing space acquisitions also affords us an opportunity to "take stock" of risks resulting from the significant increase in threats to our space capabilities, as well as the potential opportunities associated with the growth of both U.S. commercial and allied space capabilities and services. In every aspect of the space acquisition process, and accepting and internalizing the implications that attend space as an almost certain theater of active combat operations, we and our industrial members need to think differently about how we prioritize requirements for, develop, produce, and operate our next generation space capabilities. In parallel, and equally important in the current and likely future fiscal environment, we need to integrate into our architecture development and force structure planning the advantages of utilizing more commercial and/or allied capabilities and services.

My boss, Frank Kendall, the Under Secretary of Defense for Acquisition, Technology and Logistics, has challenged us to look forward 20 to 30 years to identify the types of space capabilities that are likely to be needed by the Department of Defense to cope with evolutionary and potential revolutionary changes to existing and near-term threats, as well as the threats and opportunities emerging from continued technological change. In doing so, our goal is to try to define the more specific near-term actions and investments that we can implement now and in the near future, thereby enabling us to achieve those capabilities. We, and our colleagues in the Defense Department and Intelligence Community are working hard to minimize our predictive errors, recognizing concurrently that whatever predictions we make about future threats and technologies will be imprecise and likely inaccurate. Events

transpiring in the Ukraine over the past several weeks have been a humbling reminder of the difficulty in trying to plan for the future with any degree of confidence. Therefore, we plan to emphasize development of space capabilities across the science and technology, research and development, and acquisition sectors in both Government and industry that are sufficiently agile, flexible, and resilient to adapt as that world takes shape.

Part of thinking differently about future capabilities is accurately framing the context for our analysis. For purposes of planning, developing, acquiring, and operating the next generations of U.S. space capabilities, this context or operating environment can be characterized as one reshaped by "five tectonic shifts":

The Threat:

Even as our dependence on space capabilities, goods, and services continues to increase, and although we maintain a substantial asymmetric advantage due to those capabilities, the rapid evolution and expansion of threats to our space capabilities at every orbit regime has highlighted the converse: an asymmetric disadvantage due to the increasing susceptibilities and vulnerabilities of these systems.

We risk confronting a potential strategic imbalance in which adversaries are increasingly able to use space to support military operations, and also threaten our ability to sustain use of our space capabilities. Meanwhile our abilities have lagged to protect our own use of space and also deny that access to an adversary. Any adversary would almost certainly trade its own ability to utilize space if in return it could deny U.S. use of space to support military and intelligence operations. We must rectify this

imbalance as a national security priority. To do so, we need to significantly change: (1) our prioritization among requirements for added capability and increased resiliency for future space acquisitions; (2) the areas of emphasis for our space Science and Technology efforts; (3) how we think about and conduct architectural planning for future space capabilities; (4) how and how fast we develop and manufacture these capabilities and the resulting implications for the space industrial base; (5) how we think about access to space, space control--including space situational awareness, space control, and intelligence support; and (6) related policy, strategy, doctrine, concepts of operations, and TTPs. These last topics are best left to my colleagues here today and throughout the national security space community.

Budget:

There is a two-fold impact that has resulted from the consequences of The Budget Control Act, sequestration, and the high likelihood that substantial resources to fund major space acquisition program "new starts" are very unlikely to either be proposed or funded for the next several years. Despite significant progress in space acquisition and the promise of even more cost reduction resulting from Better Buying Power affordability initiatives, the simple truth is that most space systems are and will remain highly capital intensive, relatively expensive investments. Moreover, many of the changes likely to be required to adapt to the changed threat, and resulting from other changes described here will require additional, new investments at precisely the same time as the Department is managing a significant drawdown in most other warfare areas. Finally, the costs for most of the architectural "block changes" that offer

opportunities to adapt and improve our capabilities will be incurred over roughly the same time period, raising the prospect of the "stacking" of a number of unaffordable budgetary and programmatic bow waves. Even as we continue to address affordability in individual programs, we are concerned about our overall ability to maintain stable budgets for the capabilities we will need in the future.

*"*Friends and Neighbors":

The cost related "barriers to entry" for access to space remain high. Nevertheless, the economic and security advantages provided by space capabilities, coupled with the proliferation of many of the required technologies have incentivized a growing number of nations to develop indigenous space capabilities. In addition, the costs and complexity to use space–related goods and services has become both easier and in many cases relatively inexpensive. Many nations can simply partner with spacefaring nations and commercial entities, and invest, for example, in hosted payloads, thereby forgoing the high cost of developing and maintaining a launch infrastructure and space industrial base. A range of commercial and government-to-government arrangements can provide access to end-to-end communication, imagery, and/or positioning, navigation, and timing services. These developments offer both opportunities and threats for U.S national security. For the space acquisition community to take advantage of these opportunities, we will need to significantly shorten our requirements development and decision-making cycle times. More basically, we will need to think differently about the levels of services and capabilities that will be "good enough" to satisfy our requirements, rather than continue to focus

our attention on developing capabilities ourselves that satisfy all of our most stressing requirements. This cultural change alone represents a major adjustment in thinking for the national security space community in general and the space acquisition community in particular.

Changing Technology:

The role reversal that began almost 25 years ago and turned the U.S Government to more of a technology "follower" than leader continues to accelerate, and broaden in scope. In parallel, the proliferation of space faring nations and the growth of a vibrant worldwide commercial space sector has accelerated development of, and lowered the costs of manufacturing for many technologies whose development and production previously required large scale U.S. Government investment. Like the emergence of new space-faring nations and commercial providers, the sustained space-related technology developments and deployments certainly require that we alter the calculus for our future space acquisitions; and for the emphasis we place on, and the resources we allocate to our own science and technology investments. More than ever before, we also need to devote greater attention and resources to intelligence collection and analysis devoted to predicting and understanding technology change. As perhaps just one simple, but critical example of the "new normal" we must realize: we have to shorten the time from requirements definition to "authority to proceed".

The "Dial Tone:"

Perhaps no change has had more profound impact than the fundamental shift in the breadth, depth, and diversity to both the uses to which space capabilities are

applied, and to the user population. Space capabilities, and the expectations and demands of those who use them have been transformed. At their creation and for much of the first 30 years of the "space age," satellites comprised a largely highly classified niche capability focused on a relatively small, geographically limited user clientele, with relatively limited, homogenous requirements and relatively modest performance expectations often constrained by technology and engineering limitations. In the past 25 years, space capabilities have become to defense and intelligence users what the dial tone on the telephone long ago became for all of us: a commodity service whose presence we take for granted until the moment its availability is interrupted. Our dependence on space has become inextricably linked to our other critical capabilities. Our belated realization that space would become a contested battlespace leaves us with few planned or exercised alternative means to meet our needs, should the availability of our space assets be interrupt.

The consequences and implications of this "transformation" for our military and intelligence users have now become familiar to the members of this committee; I also described some of them earlier in my statement. This fundamental change, when combined with the other shifts described here confront the space acquisition community -- and, in my view, to all aspects of our national security space community and its industrial base foundation -- with two, largely opposing sets of challenges: simultaneously maintaining service continuity and technology innovation. Absent significant changes in "how we do space writ large," it is likely to be increasingly difficult to reconcile these challenges. For the space acquisition and supporting science and

technology community, the dilemma is to: sustain the resources and capabilities to concurrently maintain a continuity of services that is a sine qua non of U.S. national power; cope with increasingly potent threats; foster a level of science, technology, and development investment to catalyze the next generation "breakthrough" capabilities; and effectively make use of commercial and allied goods and services. All of this must be accomplished in an environment of flat and potentially diminishing resources. Nevertheless, maintaining U.S. national security in the future will depend on developing, acquiring, partnering, and/or buying space capabilities and services that strike an affordable balance between "sustaining the dial tone" while maintaining critical niche superiority and overall pre-eminence.

We have an enormous amount of work to do to adapt effectively and in a timely manner to these changes. The required work and adaptations will affect the entirety of national security space activities in both government and industry. From policy, strategy, requirements, through all phases of the acquisition cycle, and also to doctrine, training, concepts of operations and tactics, techniques, and procedures, our national security community must "think about and 'do' space" very differently. I have already mentioned some of the changes that are required, and we have already begun the process of "retooling" some of our processes, as well embedding a heightened sense of urgency to executing affordable and lower cost acquisitions.

Despite these changes, a great deal of work remains to be done. Just two examples illustrate our challenges: we need to elevate the importance of implementing measures to improve resiliency for our space capabilities--providing an ability to

withstand attempts to damage or destroy them and continue to function--so that these modifications and improvements are able to compete for resources, as or even more effectively than has historically been true for improvements to performance. Second, our processes and decision timelines, but first our thinking, must recognize the increasing potential of many of these goods and services to play an integral role in our future architectures and to meet an increasing share of our requirements. These capabilities must come to be thought of as the "first option" for meeting our needs, rather than as an adjunct or afterthought when we decide what systems to replenish and/or maintain as U.S. Government developed, acquired, and operated.

We are at a strategic crossroads or inflection point for the future of national security space capabilities. We still enjoy the advantages of capabilities brought about by past large-scale investments and expenditures that often enjoyed a largely unfettered call on resources. Without wholesale sacrifices in other domains, we simply can't afford that path in the future. As we move forward, we must address affordability – effectively as a performance requirement-- as well as measurability, and demonstrable effectiveness as we evaluate the mission-based needs of the future. We have to explore the entire range of alternatives, including space-based and non-space-based systems to determine what will provide the level of service we need, while meeting those criteria.

We are already beginning to make measurable progress. Our current approach improving resilience consists of three elements: (1) improving our on-orbit systems, using software upgrades from the ground, as well as implementing combat-relevant tactics, techniques, and procedures in our operations; (2) making prudent changes to

systems already in acquisition, thereby minimizing costly redesigns and disruption to factory flows; and (3) applying a more comprehensive and holistic approach to improving resilience as we implement block changes to the next generation of capabilities and architectures.

The pre-requisite for improved resilience, our situational awareness, must be transformed from an historic focus on flight safety and collision avoidance, to a high performance battle management and command and control capability and infrastructures capable of managing operations in a contested theater of operations. Currently, in its air, maritime, and terrestrial domains, the Air Force, Navy, Army, and Marines and the combatant commanders they support enjoy a level of situational awareness that is impossible in the space domain, but will be essential in the future. In other domains, warfighters plan for attrition as a natural consequence of the campaign or engagement. Force structures are developed and fielded that account for this inevitability. Consistent with reassessed priorities, affordability, and likely effectiveness, we need to bring similar thinking to our architectural and force structure planning for space capabilities.

The Fiscal Year 2015 (FY15) President's Budget reflects the DoD's commitment to measured, "pragmatic progress" as we plan our future space capabilities. Programs are beginning to accept some degree of manageable risk, measured against affordability and the availability of alternate means to meet our requirements. As only one example, the Fiscal Year 2015 (FY15) President's Budget built on the results of an Analysis of Alternatives to accept additional risk of a gap in weather forecasting and environmental

sensing capability by moving the Weather Satellite Follow-on program schedule to the right. Risk was judged to be acceptable because we believe that we could count on civil, commercial and/or foreign partners for the immediate future and use the additional time to craft a longer term replenishment strategy.

The Department modified and re-phased a number of space programs for the FY15 President's Budget. These are reflected in several key program initiatives that leverage planning for future follow-on systems and take advantage of operational benefits associated with support to the warfighter.

In keeping with Departmental strategic guidance, the Space Based Infrared System (SBIRS), Advanced Extremely-High Frequency (AEHF), and Global Positioning System (GPS) are utilizing Space Modernization Initiative (SMI) investments to ensure affordability, capability, and resiliency for these mission areas in order to remain competitive in the strategic environment. SBIRS, AEHF, and GPS have developed SMI strategies to invest in program efforts that create trade space for future acquisition decisions through investments to sustain or improve their current Programs of Record and to plan for the future by exploring affordable technology alternatives and architectures. Depending on several factors such as the health of the constellation, parts obsolescence, and technology breakthroughs, each SMI investment plan addresses program-specific challenges and threats to ensure continued capability.

The Department is delaying the GPS-III space vehicle procurement timeline to reflect the on-orbit constellation's long lifetime. Although this action moves the procurement of 3 GPS-III satellites outside the FYDP, the new constellation profile does

not impact the 24 GPS satellite requirement.

The Department ensured full funding for a Space Fence Site 1 contract in FY14, the Space-Based Surveillance System (SBSS) Follow-on, and a number of other classified initiatives. SBSS Follow-on funding will be delayed by one year as we review space-based capabilities to meet mission requirements.

Working with the Congress, the Department has ensured stability in the acquisition of SBIRS geosynchronous Earth orbit (GEO) satellites 5 and 6. Awards of long-lead advanced procurement contracts in FY12 and FY13 have provided the necessary hedge against schedule and technical risk to the SBIRS GEO 5-6 Satellite Replenishment Production (SRP) effort currently pending contract award. Regardless of any delays, these long-lead advanced procurement activities have poised the program for successful transition to GEO 5-6 production when the production contract is awarded.

Finally, the Department adjusted the profile for the Evolved Expendable Launch Vehicle (EELV) program. The December 2013 contract award took advantage of efficiencies jointly identified by the Government and the EELV contractor. The Department took special care to simultaneously ensure changes in EELV balanced Economic Order Purchasing that will lower costs and stabilize the industrial base while also implementing the procedures and processes to enable certified new entrants to enter into a competitive marketplace. These decisions are consistent with our broader goals for mission-based acquisition planning and we are ensuring that architecture efforts inform these decisions. Some of those architecture efforts, such as the

Protected SATCOM and SBIRS Follow-on Analyses of Alternatives and a number of new NRO architecture plans and initiatives are in various stages of execution, but they represent opportunities for effective evolution and adaptation to our changed circumstances and operating environment.

I would like to amplify details about a few specific programs that offer insight into how we are balancing our acquisition approaches with our look to the future:

Evolved Expendable Launch Vehicle (EELV)

Our assured access to space provides national security decision-makers with unfettered global access and unprecedented advantages in national decision-making, military operations, and homeland security. Maintaining the benefits afforded to the United States by space is central to our national security, and we cannot achieve this without an efficient and reliable space launch capability, that is robust, responsive and resilient, and enables our space operations. The incredible success of 68 successful operational EELV missions since 2002 and 99 National Security missions since 1998 came after a string of failures in the late 1990's that caused us to refocus on mission assurance. The cost of a single launch failure, especially one with a multibillion dollar satellite on board, can very quickly overwhelm any savings achieved by aggressive acquisition strategies. This is why we consider certification of new entrants, and mission assurance for all providers to be essential elements of our launch program .As we implement the certification process for New Entrants to the EELV program we are continuing this focus in cooperation with each of the prospective EELV New Entrants. Our rigorous multi-step certification process will ensure all new launch service providers

meet the existing high USG levels of design and operational reliability. This USG Mission Assurance process has evolved over the last 15 years, and is tailored to the risk tolerance of the payload to be launched. We will continue to evolve this process as new entrants are on-ramped onto the EELV program.

The Department shared a congressional concern over the past few years over the high costs of maintaining a successful domestic space launch capability. The Air Force took steps to significantly restructure the EELV program in 2012 and we subsequently devised a strategy to take advantage of this restructure, balancing efficient procurement with the stabilization of the industrial base and the ability to expand the program to allow for competition as early as possible. As a direct result of this strategy, and our concerted efforts to apply the Department's Better Buying Power principles to the program, we successfully negotiated and awarded a contract which will acquire new EELV cores and the capability to launch those and previously procured cores. This effectively stabilizes the U.S. launch industrial base while continuing to support a strategy that has saved the Department and taxpayers more than $4.4 billion dollars.

The Air Force's strategy to introduce competition into the EELV program provides the opportunity for multiple potential launch providers, such as SpaceX and Orbital Sciences Corporation and potentially others, to successfully complete the New Entrant Certification process through the joint development of New Entrant Assessment Certification Plans for each of the certification launches, opportunity for joint Cooperative Research and Development Agreement (CRADA) with the Air Force, explicit

Statements of Intent and initial assessments. The Air Force has also procured competitive launch services from SpaceX for the joint National Aeronautics and Space Administration (NASA) / National Oceanic and Atmospheric Administration (NOAA) Deep Space Climate Observatory payload and a Space Test Program mission, STP-2. These missions represent more risk tolerant launch opportunities that will provide operational experience to the company with the Government's current Mission Assurance processes, positioning them to compete more effectively for future EELV-class National Security Space (NSS) missions.

The AF has also begun the process of developing an early integration contact with SpaceX to ensure that once the company is certified as an EELV provider they will be prepared to aggressively compete for any available NSS launch service.

The certification launches are only a portion of the rigorous multistep certification process that I discussed earlier. The AF EELV New Entrant Certification Team continues to assess launch operations activities, associated readiness reviews, design certification reviews, and reliability certification activities.

Operationally Responsive Space (ORS)

We share the interest of Congress in achieving shorter development times for space capabilities. But fully implementing operationally responsive space would require significant resources to address the satellite to launch vehicle integration and lack of reserve or spare satellite inventory that are binding constraints. In May 2013 the Defense Space Council directed the development of a strategy for best use of ORS appropriated funds to address the way forward. In addition, CDRUSSTRATCOM

identified four need areas, based on the Joint Force Commanders' stated Immediate Needs, to make the best use of the remaining FY13 appropriated ORS funds.

The Department has not allocated separate resources for ORS in FY13, 14 or 15; we have empowered the Program Executive Officer (PEO) for Space to use the streamlined authorities and processes developed in ORS to address critical gaps, tackle risk mitigations needs in the development of follow-on programs and apply affordability measures where applicable. We are maintaining oversight of this approach through the ORS Executive Committee at the OSD level.

In addition to the careful management by PEO Space, we will continue to keep the ORS program focused on developing solution options to satisfy COCOM urgent needs as we develop the strategy to leverage ORS enablers and infrastructure and integrate ORS principles into DoD Space acquisition. We believe this meets the intent of the FY07 NDAA which chartered the ORS office to contribute to the development of capabilities to fulfill joint military operational requirements and to coordinate and execute ORS efforts across the Department's planning, acquisition and operations functions. It also meets the direction of the FY13 NDAA for the PEO Space to be the Acquisition Executive and to provide streamlined authorities for ORS projects.

Commercial Satellite Communications Services

The Office of the Chief Information Officer and AT&L have jointly undertaken a study to address options for providing wideband satellite communications capability in the near, mid, and long term. As you know, our current capability is comprised of Department of Defense systems (Defense Satellite Communications System Phase III

(DSCS III) and Wideband Global SATCOM (WGS) satellite) and commercial SATCOM leases. The current distribution of capability was driven by the exigencies of Operations Enduring Freedom (in Afghanistan) and Iraqi Freedom (in Iraq) and the availability of Overseas Contingency Operations (OCO) supplemental funds. The CIO and AT&L study team is analyzing the utilization of the leased capabilities to inform recommendations on acquisition and governance approaches to improve efficiency and lower cost as we move forward. The report on this first phase is in final editing and review.

Additionally, AF Space and Missile Systems Center (SMC) is still pressing forward with the Commercial SATCOM Pathfinder project to buy an on-orbit wideband transponder. They have already released a draft RFP, conducted industry days, plan to release the final RFP on 8 April, and award the contract by the end of June.

Dependence on Russian Engines (RD-180)

The majority of NSS payloads are launched on vehicles acquired under the Evolved Expendable Launch Vehicle (EELV) program which acquires the Atlas V and Delta IV families of launch vehicles. The Russian produced RD-180 rocket engine is used to power the Atlas V first stage and provides access to space for some of our most critical national security space payloads. There were sound policy and cost savings reasons for the original decision to allow the incorporation of this engine into a US launch vehicle. One of the considerations explicitly addressed at the time of that decision – and periodically since that time -- was the risk associated with utilizing a non-US-manufactured article for a critical national security capability. Recent events have renewed our existing concerns about this practice.

Since the origins of the EELV program, the Department has prepared for the possibility of a potential RD-180 supply disruption and has put in place several measures to mitigate the risk and impact. This strategy includes multiple independent hedges against this supply risk and is cost effective. First, the nation has maintained an additional domestic capability with the Delta IV variant of the EELV to launch national security payloads. In addition, the Department is introducing competition that will increase and diversify its ability to launch national security payloads. Lastly, our industry partner maintains a multi-year supply of RD-180 engines in the United States, thereby insulating the Department against any near-term disruptions to the launch manifest. Nevertheless, we are evaluating whether it's in the long term U.S. national security interests, and that of significant elements of our space industrial base, to develop a next generation US designed and built engine. This approach and others is part of the Department's reexamination of its strategy to ensure it is still capable of providing assured access to space. The study will include both immediate and longer-term responses to a potential interruption of supply including manifesting of missions to the Delta IV launch vehicle, evaluating the options for developing a replacement engine, as well as the possible utilization of EELV New Entrants to supplement existing government space lift capability. The Department is coordinating its efforts with those underway at the National Security Council and the Office of Science and Technology Policy on the National Rocket Propulsion Strategy requested by Congress in the Section 1095 of the National Defense Authorization Act of 2012. We expect this study to be complete later

this Spring and its results will help to guide us in developing a future assured access to space strategy for every NSS payload.