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S. HRG. 111–100, PT. 7

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2010

HEARINGS

BEFORE THE

COMMITTEE ON ARMED SERVICES
UNITED STATES SENATE

ONE HUNDRED ELEVENTH CONGRESS

FIRST SESSION

ON

S. 1390

TO AUTHORIZE APPROPRIATIONS FOR FISCAL YEAR 2010 FOR MILITARY ACTIVITIES OF THE DEPARTMENT OF DEFENSE, FOR MILITARY CONSTRUCTION, AND FOR DEFENSE ACTIVITIES OF THE DEPARTMENT OF ENERGY, TO PRESCRIBE PERSONNEL STRENGTHS FOR SUCH FISCAL YEAR, AND FOR OTHER PURPOSES

PART 7
STRATEGIC FORCES

MAY 20 AND JUNE 3, 2009

Printed for the use of the Committee on Armed Services

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2010—Part 7 STRATEGIC FORCES

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DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2010

WEDNESDAY, MAY 20, 2009

U.S. SENATE,
SUBCOMMITTEE ON STRATEGIC FORCES,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

MILITARY SPACE PROGRAMS

The subcommittee met, pursuant to notice, at 2:08 p.m., in room SR–232A, Russell Senate Office Building, Senator Bill Nelson (chairman of the subcommittee) presiding.

Committee members present: Senators Bill Nelson, Sessions, and Vitter.

Committee staff member present: Jennifer L. Stoker, security clerk.

Majority staff member present: Madelyn R. Creedon, counsel.

Minority staff members present: Michael V. Kostiw, professional staff member; and Daniel A. Lerner, professional staff member.

Staff assistants present: Kevin A. Cronin and Brian F. Sebold.

Committee members' assistants present: James Tuite, assistant to Senator Byrd; Christopher Caple, assistant to Senator Bill Nelson; Jennifer Barrett, assistant to Senator Udall; Rob Soofer, assistant to Senator Inhofe; Pete Landrum, assistant to Senator Sessions; and Michael T. Wong, assistant to Senator Vitter.

OPENING STATEMENT OF SENATOR BILL NELSON, CHAIRMAN

Senator BILL NELSON. Good afternoon. I will insert my prepared statement for the record at this point, and now turn to our ranking member, Senator Vitter.

[The prepared statement of Senator Bill Nelson follows:]

PREPARED STATEMENT BY SENATOR BILL NELSON

I would like to welcome all of our witnesses today to the Strategic Forces Subcommittee hearing on military space programs and issues. Today we have Gary Payton, the Deputy Under Secretary of the Air Force for Space; General Robert Kehler, Commander of Air Force Space Command; Lt. Gen. Larry James, Commander of 14th Air Force and the Joint Functional Component Commander for Space; Vice Admiral Harry Harris, the Deputy Chief of Naval Operations for Communications Networks; and Cristina Chaplain, the Director of Acquisition and Sourcing Management at the Government Accountability Office. All of your statements will be included in the record.

I would also like to welcome Senator Vitter, who, as of last week, is the new ranking member on the Strategic Forces Subcommittee, replacing Senator Sessions. I look forward to a productive working relationship.

It has been a pleasure to work with Senator Sessions over these past several years. We have tackled a lot of difficult issues together. I am glad he will stay on the subcommittee.

Space is essential for modern life and for a modern military, but getting satellites built and on orbit is not easy and not cheap.

Most of the space programs continue to struggle, although there has been improvement in some programs, others, such as Space-Based Infrared Satellite-Geosynchronous Orbit and the advanced extremely high frequency satellite continue to be delayed. What are the problems and how do they get fixed?

While the United States has been very lucky that satellites, once launched, generally have a history of lasting longer than planned, in some cases much longer. With the delays in the replacement programs there is a potential for gaps in the various programs. This is particularly true for missile warning.

We will also look at what role small satellites can play in meeting certain requirements, augmenting or replacing capabilities, and in reducing the overall size, complexity, and cost of space systems.

We look forward to hearing from all of you this afternoon.

We will have a very short closed session in the Office of Senate Security relating to the launch of the North Korean missile at the conclusion of the opening session. We will plan on moving over there at a little after 3 o'clock.

STATEMENT OF SENATOR DAVID VITTER

Senator VITTER. Thank you very much, Mr. Chairman. It is great to be here as the ranking member of this subcommittee for the first time. I look forward to working with you and all the other members on these significant issues.

I will submit my full opening statement for the record, but I do want to highlight a number of concerns.

The Government Accountability Office (GAO) is here today, and I look forward to hearing from all the witnesses, including them. For sometime, they have highlighted a number of systemic problems associated with our major space acquisition programs. Generally, they have said that competition for dollars leads to low-cost estimation and unrealistic scheduling, and then that gets us in a bind down the line when the true costs of programs and true schedules come into clear focus. So I would like everyone's reaction to that ongoing critique and what we should do in light of it.

I want to thank Chairman Levin and Ranking Member McCain for their acquisition reform bill, which I am happy to support and would love folks' reaction to what is in that bill, how that can make a difference and what more we need to do.

I am also encouraged with many—not all, but certainly many—of Secretary Gates' strong recommendations to cancel certain programs that were not proving out like the Transformational Satellite (TSAT) program and to focus resources and certainly would like folks' detailed thoughts on that and how we move forward in a productive way.

Then finally, I would point out a recent Institute for Defense Analyses (IDA) report, chartered by the Department of Defense (DOD), to address significant congressional concerns. One conclusion of the report is an assertion that "no one is in charge," that leadership is fragmented with respect to strategy, budgets, requirements, and acquisitions, and it recommends that the President establish and lead the execution of a much more focused national space strategy. It also recommends a top-to-bottom overhaul, and

I very much look forward to hearing everyone's reaction to that critique and those recommendations.

But, again, Mr. Chairman, thanks for your leadership and I look forward to working with you.

[The prepared statement of Senator Vitter follows:]

PREPARED STATEMENT BY SENATOR DAVID VITTER

Thank you very much, Mr. Chairman, I join you in welcoming our witnesses. This is my first hearing as ranking member of the Strategic Forces Subcommittee and I look forward to working with you on the many important issues under this subcommittee's jurisdiction.

The administration's fiscal year 2010 budget provided a significant funding increase for Defense-wide, "white space" programs. This year's request at about $11.1 billion—$9.2 billion of which is for Air Force space programs represents a $412 million increase over fiscal year 2009 appropriated levels. I look forward to hearing from our witnesses today how this money will be spent wisely and what will be done to guarantee that the programs we fund in fiscal year 2010 break away from past practices of cost overruns and long delays.

The Government Accountability Office (GAO), which I am pleased is here today to testify, has for some time highlighted a number of systemic problems associated with our major space acquisition programs. GAO has found that because the Department of Defense (DOD) starts more weapon programs that it can afford—competition for dollars lead to low cost estimation and unrealistic scheduling. GAO notes that DOD tends to start many of its space programs before it has a sound understanding and the appropriate assurance that the technologies it seeks are achievable within available funding. As a result of this broken acquisition process, the Department all too frequently puts itself in a bind with respect to supporting the warfighters' needs. Not only are we constantly underestimating cost, but according to GAO, delays in schedule are increasing the overall risk for capability gaps in areas such as positioning, navigation, and timing; missile warning; and weather monitoring.

Under the leadership of Chairman Levin and Ranking Member McCain, this committee broadly recognized those problems in developing the "Weapon Systems Acquisition Reform Act of 2009." That bill emphasizes starting major weapons systems off right by having them obtain reliable and independent cost estimates and subjecting them to rigorous developmental testing and systems engineering early in their acquisition cycle. In so doing, the bill (which will likely be signed into law by the President within the next few days) intends to ensure that programs not proceed from one stage of the acquisition cycle to the next until they have achieved the maturity to clearly lower the risk of cost growth and schedule slippage. I look forward to hearing from our witnesses how they believe the bill will help manage technology and integration risk in DOD military space programs.

I am encouraged by Secretary Gates' recommendation to cancel the Transformational Satellite (TSAT) program, an example of an overly ambitious project, lacking a meaningful technology, schedule, and funding path. I am also pleased to hear that the Department will not let the $3.3 billion already invested in TSAT go to waste. With the recommendation to eliminate TSAT and purchase two additional advanced extremely high frequency satellites, it is clear that the Department recognizes that smaller, more incremental steps forward, are far less risky ventures, and are a significantly more responsible path forward with respect to the taxpayers' money. I am encouraged that the Department does not plan to let our hefty investment in TSAT go to waste and does plan to harvest some of TSAT's more successful research and development efforts. I look forward to hearing from our witnesses more about the plan to address our satellite communications needs, how we will utilize TSAT technologies on the procurement of already proven and technologically mature systems, and how TSAT can be a lesson moving forward for our future space acquisition endeavors.

A recent Institute for Defense Analyses report charted by DOD to address congressional concerns with the leadership, management, and organization for National Security Space found that "significant improvements are imperative . . . in order to maintain U.S. space preeminence and advert the loss of the U.S. competitive national security advantage." The report asserts that "no one's in charge," leadership is fragmented with respect to strategy, budgets, requirements, and acquisition, and recommends that the President establish and lead the execution of a national space strategy. The report recommends a top-to-bottom overhaul and I look forward to

hearing from the witnesses what steps are being taken to address the report's recommendations.

I recognize that space acquisitions are inherently risky and are like no other venture the DOD undertakes. The challenges are many and the unknown and need for pushing the technology envelope is great. However, we must do a better job at managing the risk and spending the taxpayers' money wisely. Nonetheless, I look forward to hearing from the witnesses what is being done to address the space acquisition shortcomings, if you believe the condition is getting better, and what more needs to happen within the Department.

Mr. Chairman, thank you.

Senator BILL NELSON. As is the procedure, each of your statements will be entered in the record at this time.

STATEMENT OF GARY E. PAYTON, DEPUTY UNDER SECRETARY OF THE AIR FORCE FOR SPACE PROGRAMS

[The prepared statement of Mr. Payton follows:]

PREPARED STATEMENT BY GARY E. PAYTON

INTRODUCTION

Chairman Nelson, Senator Vitter, and distinguished members of the subcommittee, it is an honor to appear before this subcommittee as the Deputy Under Secretary of the Air Force for Space Programs, and to discuss with you our military activities. I support the Secretary of the Air Force with his responsibilities as the Service Acquisition Executive for Space Programs.

1I believe the overall soundness of our Air Force space program is best illustrated by our consecutive string of 61 successful national security space launches over the past 10 years and the sustainment of 4 distinct satellite constellations over the past 3 decades (navigation, weather, missile warning, and military communication). This record is the result of a world-class team of space professionals across our government and industry, all dedicated to the single purpose of providing essential capabilities to our joint warfighters and allies around the world. As a Nation, we have cultivated, modernized, and integrated space capabilities for over a half century into our national instruments of power—diplomatic, information, military, and economic. The nation's reward for this commitment is a space capability which tilts the geopolitical and military advantage to our leaders with the most current and accurate information around the world. With superior space systems we provide our leadership with intelligence that otherwise would be impossible to collect. Space enables us to employ military force in both irregular warfare and conventional situations—we see the battlefield more clearly and destroy targets with greater precision. While acknowledging the ever increasing advantages that these space capabilities provide, we acknowledge that many of the satellites and associated infrastructure have outlived their intended design lives.

To ensure the availability of these systems, the military space portion of the President's fiscal year 2010 budget submission is focused on the continuity of key mission areas including global missile warning, worldwide communication, global positioning and timing, weather, and launch. Simultaneously, we are taking added measures to enhance the protection of our space capabilities through improved Space Situational Awareness (SSA), defensive counterspace, and reconstitution efforts.

Global Missile Warning through Overhead Persistent Infrared (OPIR) is our unblinking eye ensuring that we know whenever a rocket launches from anywhere on Earth. Our missile warning system is fast, persistent, and accurate in determining missile vectors. At the strategic level, it quickly aids leadership as they determine courses of action to defend America and our allies, and at the tactical level our real-time warning provides theater commanders with superior battlespace awareness.

Worldwide communication is enabled through a ubiquitous space-based system with government and commercial platforms. Our users stretch from the Oval Office to the mountains of Afghanistan. Using protected, wideband, or narrowband communications, the President can command the Nation's nuclear forces, our UAV pilots can fly Predators over Iraq and Afghanistan from the United States, and Special Forces teams can call for exfiltration or tactical air support.

Global positioning and timing is a free worldwide service. It provides position accuracy down to the centimeter and time accuracy to the nanosecond over the entire

planet, 24-hours a day, 7-days a week, and in any weather. The Department of Defense (DOD) and the Intelligence Community depend on our Global Positioning System (GPS) to support a myriad of missions and capabilities including weapon system guidance, precise navigation, satellite positioning, and communication network timing. The civil and commercial communities are equally reliant on GPS as the underpinning for a vast infrastructure of services and products including search and rescue, banking, map surveying, farming, and even sports and leisure activities.

Weather observation and forecasting has greatly improved over the last four decades primarily due to space-based environmental sensing. Global, high resolution measurements of atmospheric temperature, density, and humidity populate mathematic models for weather prediction. Our warfighters need accurate, time-sensitive weather data as a key enabler for maneuver planning, weapons employment, and intelligence collection.

With events like the Chinese ASAT demonstration and the Iridium/Russian satellite collision as examples of the increasing political and physical complexity of the space environment, our on-orbit assets face greater threats that could deny, damage, or destroy our access to space capabilities. We must anticipate potential disruptions, either accidental or intentional, to our space operations or risk losing continuity of service. As such, we are expanding our ability to detect, identify, characterize, and attribute threats, as well as clearly discriminate between a hostile act and one that is naturally occurring. In parallel, we are developing the organizational, operational, and technical enablers including command and control architectures that will allow us to react swiftly and decisively when threats materialize.

Though challenges remain, Congress' support has been a vital component in improving our acquisition of space systems, maintaining continuity of service, and charting a course for the next generation of space capabilities that will enhance American security, freedom, and prosperity.

UPDATE ON SPACE

I would like to briefly discuss some of the achievements we have had over the last year and the progress we are making with regard to the mission areas I described earlier.

Missile Warning

For over 35 years, our legacy Defense Support Program (DSP) satellites, in conjunction with ground based radars, have unfailingly met the Nation's missile warning needs. This legacy constellation, however, continues to age, while threats such as the proliferation of theater ballistic missiles and advanced technologies continue to grow. These threats are driving the need for increased coverage and resolution provided by the Space Based Infrared System (SBIRS).

SBIRS supports four mission areas: missile warning, missile defense, technical intelligence, and battlespace awareness, and is comprised of both geosynchronous earth orbit (GEO) satellites and highly elliptical orbit (HEO) payloads. In 2008, the first HEO payload was fully certified by United States Strategic Command to perform the strategic missile warning mission. The second HEO payload is on-orbit and proceeding through operational checkout. Launch of the first SBIRS GEO satellite is scheduled for late 2010.

Our funding request continues development of the GEO satellite, HEO payloads, plus the necessary ground elements. Additionally, this budget requests advanced procurement for a fourth GEO satellite, and procurement of our fourth HEO payload. We continue to work with our industry partners to resolve challenges on the SBIRS GEO–1 spacecraft, specifically with respect to the Flight Software Subsystem. Our budget request also funds Wide Field-of-View (WFOV) technology development within the Third Generation Infrared System funding line. By partnering with the commercial space industry, we will have the opportunity to conduct early on-orbit scientific experiment of WFOV infrared data phenomenology using a Commercially Hosted IR Payload (CHIRP) in 2010. WFOV offers considerable potential for reducing cost, schedule, and performance risks for the next generation of missile warning satellites.

Communications

The United States military is a highly mobile and dispersed force that relies heavily on wideband, protected, and narrowband satellite communications (SATCOM) for command, control, and coordination of forces. SATCOM enables forces to receive real-time images and video of the battlefield, thereby accelerating decision-making from the strategic to the tactical levels. These images and video often come from Unmanned Aerial Vehicles (UAVs) controlled via SATCOM links, allowing the

UAVs to fly far beyond the line of sight and to collect information without endangering U.S. forces.

On April 3, 2009 we successfully launched the second Wideband Global SATCOM (WGS) satellite as part of the Department's constellation of wideband satellites providing increased capability for effective command and control of U.S. forces around the globe. In August 2009 we are planning to launch the third WGS satellite. As we populate the WGS constellation, each individual satellite provides greater wideband capacity than the entire legacy Defense Satellite Communications System (DSCS) III constellation. Our fiscal year 2010 funding request continues on-orbit support for WGS–2 and WGS–3, as well as, non-recurring engineering development and advanced procurement for WGS–7.

In the protected SATCOM portfolio, we are completing testing of the first Advanced Extremely High Frequency (AEHF) system with a projected launch in late 2010. This initial AEHF launch will complete the worldwide Medium Data Rate (MDR) ring, increasing the data-rate for low probability of intercept/detection and anti-jam communications from tens-of-kilobytes per second to approximately a megabyte per second. Last September, the Secretary of the Air Force declared a critical breach of the average procurement unit cost (APUC) against the AEHF Acquisition Program Baseline. The cost growth was dominated by the 4-year production break between the SV–3 being placed on contract in January 2006 and SV–4 contract award projected for early 2010. Subsequently, the Under Secretary of Defense for Acquisition, Technology, and Logistics USD (AT&L) led a team of DOD organizations that reviewed the AEHF program to determine if: (1) the program was essential to national security, (2) there were any alternatives that could provide equal capability at less cost, (3) the new estimates of the unit cost were reasonable, and (4) the management structure was adequate to control costs. On 29 December 2008, USD (AT&L) certified the AEHF program as a four satellite constellation with the launch dates of: SV–1 in September 2010, SV–2 in September 2011, SV–3 in September 2012, and SV–4 in September 2016. Also as part of the recertification, AEHF costs were rebaselined per DOD Cost Analysis Improvement Group estimates. Our funding request supports the assembly, integration, and test of AEHF SV–1 through SV–3 as well as the launch and start of on-orbit check out of SV–1, continued development, integration, and test of the AEHF Mission Control Segment, and the production contract award for SV–4.

On 6 April 2009, the Secretary of Defense announced key decisions and recommendations for the fiscal year 2010 President's budget submission. Among them was the cancellation of the Transformational Satellite Communications program in favor of two more AEHF satellites (SV–5 and SV–6). This recommendation was the result of careful consideration to balance valid warfighter requirements against fiscal constraints. The Air Force plans to work closely with the other Services, the Office of the Secretary of Defense, Joint Staff, and the combatant commands to meet the DOD's protected and wideband communication needs. To this end, the Air Force will evolve the MILSATCOM architecture to provide connectivity across the spectrum of missions, to include land, air and naval warfare; special operations; strategic nuclear operations; strategic defense; homeland security; theater operations; and space operations and intelligence.

Positioning, Navigation, and Timing

The United States Global Positioning System (GPS) continues to be the world standard for positioning, navigation, and timing. As a result, GPS has been incorporated into military, commercial, and civilian applications, to include navigation, agriculture, banking, cartography, telecommunications, and transportation. Last year the GPS Program Office seamlessly implemented the Architecture Evolution Plan upgrade to the existing GPS Operational Control System. This upgrade increased sustainability and provided the ability to control the new GPS IIF satellites. Perhaps most notably, these upgrades were implemented with no impact to day-to-day operations and did not require any modifications to existing user equipment.

This year we are going to launch the final GPS IIR satellite, a program which was initiated over 20 years ago and represents one of our most successful, enduring space acquisition programs. This year, we will also begin launching the next generation GPS IIF satellites which will sustain the constellation over the next 10 years. GPS IIF will also populate the GPS constellation with additional M-code capability and introduce a new "L5" civil signal.

Moving beyond GPS IIF, GPS III will offer significant improvements in navigation capabilities by improving interoperability and jam resistance. The procurement of the GPS III system will occur in multiple blocks, with the initial GPS IIIA contract award in May 2008. GPS IIIA includes all of the GPS IIF capability plus up to a ten-fold increase in signal power, a new civil signal compatible with the European

Union's Galileo system, and a new spacecraft bus that will support a graceful growth path to future blocks.

Weather

The Defense Meteorological Satellite Program (DMSP) continues to be the Nation's workhorse for terrestrial forecasting and space environmental sensing. We have three DMSP satellites remaining with DMSP Flight 18 scheduled for launch this October. Flight 19 and 20 are currently undergoing a Service Life Extension Program to repair, replace, and test components that have exceeded their shelf life. Flight 19 will launch in October 2012 and Flight 20 will launch in May 2014 or October 2016, depending on operational requirements.

In the future the Nation will transition to the next workhorse for terrestrial weather—National Polar-Orbiting Operational Environmental Satellite System (NPOESS)—a tri-agency effort with National Aeronautics and Space Administration (NASA) and Department of Commerce. Similar to the previous generation of satellites, NPOESS will provide visible and infrared cloud imagery and other atmospheric, oceanographic, and terrestrial information. It will become the Nation's primary source of global weather and environmental data for operational military and civil use.

Seemingly a straightforward idea to integrate DMSP and POES (Polar Operational Environmental Satellite) in the early 1990s, the NPOESS program has encountered unforeseen engineering challenges. Integration of requirements across the spectrum of space and terrestrial weather into several 'first-of' sensors partially caused the 2006 Nunn-McCurdy breach whereby two sensor suites were de-manifested from the program. Currently, the Visible Infrared Imaging Radiometer Suite (VIIRS) sensor has bedeviled the program, but it is planned to deliver later this year. As a result, NASA's NPP (NPOESS Preparatory Project) satellite will become a defacto operational spacecraft when it is launched in 2011. Like the DSP/SBIRS missile warning architecture, NPOESS C–1 and C–2, scheduled to launch in 2013 and 2016, respectively, will initiate the phase out of four decades of DMSP service to the country.

Operational Responsive Space

As a complement to the Nation's assured access to space, the Operational Responsive Space (ORS) program builds on the "back-to-basics" approach we have cultivated over the past several years by providing enhanced mission capability through incremental blocks of small satellites and integration of other responsive space capabilities. Key tenants of the ORS program are to keep costs low, react rapidly to urgent warfighter needs, and reconstitute capability in contested environments. A clear example of these tenants is exemplified in the first ORS (ORS–1). It is being built for United States Central Command (USCENTCOM) to monitor denied areas and will be taskable like other USCENTCOM organic airborne ISR assets.

Leveraging on the ORS–1 experiences, the Air Force will apply this model to other mission areas like communications and space situation awareness. In the fiscal year 2010 budget request we will begin the steps of on-demand space support with Rapid Response Space Capability, whereby plug-and-play satellite busses will be assembled, integrated, and tested with Modular Open System Architecture payloads.

Launch and Ranges

National Space Policy requires assured access to space. Currently this requirement is satisfied by the Evolved Expendable Launch Vehicle (EELV) program from the United Launch Alliance (ULA) consisting of the Delta IV (developed by Boeing) and Atlas V (developed by Lockheed Martin) launch vehicles. The first 23 EELV launches have all been successful, and are part of our consecutive string of 61 successful national security space launches. ULA achieves efficiencies through combined engineering, production, and launch operations while maintaining the separate Delta IV and Atlas V families of launch vehicles. The fiscal year 2010 budget request funds EELV launch capability, or infrastructure activities for two EELV launch systems and on going support for over twelve launch services ordered by the Air Force that are working toward launch. In addition, DOD requests funding for five EELV launch services which will take place in 2012.

Space Protection

The need for increased space protection of our space assets is paramount and requires enhanced SSA capabilities—improved accuracy, responsiveness, timeliness, and data integration to support the warfighter. To do this we must combine various inputs into a single picture for decision makers. Currently, operators and warfighters must assemble an understanding of the global space picture from many

disparate sources, including e-mails, telephone calls, classified chat rooms, intelligence web sites, and imagery feeds. We have acknowledged this shortcoming, and in our fiscal year 2010 budget request we are consolidating the Integrated Space Situational Awareness, Rapid Attack Identification Detection Reporting System Block 20, and Space Command and Control (C2) programs into a new program element—the Joint Space Operation Center (JSpOC) Mission System (JMS). The JMS program will continue risk reduction engineering and focus on incremental deliveries to deploy a services-oriented architecture (SOA) environment and tools to progressively advance operational capabilities toward an integrated JMS. JMS produces and delivers services in four major categories: Infrastructure provides a SOA net-centric collaborative information environment at the Top Secret/Sensitive Compartmented Information, Secret, and Unclassified levels; Mission Applications enhance and modernize accuracy, sustainability, and responsiveness of space surveillance capabilities from the legacy functionality; Command & Control (C2) provides design, development, and integration functions that create, visualize, and share decision-relevant views of space operational environment at all echelons; and, Data Integration migrates non-traditional sensors and data sources into a net-centric based enterprise enabling distribution of data obtained across traditional sensors within the space surveillance network critical to the JSpOC mission.

Two programs critical to providing SSA data to the JMS are the Space Fence and Space-Based Space Surveillance (SBSS). The Space Fence is a three station, worldwide, radar system to detect and track smaller sized space objects, while the SBSS satellite is an optical system to search, detect, and track objects in earth orbit, particularly those in geosynchronous orbit. The Space Fence replaces the Air Force Space Surveillance System and SBSS builds upon our success with the Space Based Visible technology demonstration. In the fiscal year 2010 budget, the Space Fence program will complete a System Design Review and the SBSS program will support on-orbit operations of SBSS Block 10 which is expected to launch this summer.

Space Industrial Base

A stable industrial base is vital to successful space systems. Numerous studies and reports have documented that the U.S. market share of the global space business is steadily decreasing (CSIS Study, January 2008). Maintaining a stable space industrial base is not solely an Air Force or even DOD concern, and must be addressed with our civil and commercial partners as one team.

We are working with our agency and service partners to strengthen interagency awareness and support processes to better synchronize efforts across the civil, commercial and national security space domains. The Space Industrial Base Council and its subsequent working groups consistently address industrial base and critical technologies risks and opportunities. Their efforts lead to better management practices, identification of cross-cutting technology risk areas and subsequent mitigations, and improve communication with industry. Specifically, the DOD is working to support U.S. industrial capacity in several areas key to space including batteries, radiation hardened read out integrated circuits, energy efficient solar cells, and traveling wave tube amplifiers.

Continued and enduring attention to the space industrial base, particularly the sub-tier industry, is vital to maintaining a robust and viable capability to respond to national security space interests.

Space Cadre

DOD has over 15,000 military and civilian space professionals. They are essential to our full spectrum of operations from keeping the peace to fighting the overseas contingency operations, or engaging a peer competitor. Consequently, we are committed to providing the best possible education, training, and career development to these professionals who operate, acquire, and enable our systems. Institutions like the Naval Postgraduate School, the Air Force Institute of Technology, Defense Acquisition University, and the National Security Space Institute are at the forefront of our efforts to educate and train these warriors. These organizations provide education and training throughout a space professionals' career.

We recognize that we must be able to measure how we are doing with respect to Space Professional Development. We have a set of metrics that help us gauge the numbers of cadre needed, our current supply, and the health of our cohort in terms of accessions and separations. All of these measures will help make us more efficient and better at developing our cadre, and ensuring we have the right professionals to fill billets across DOD.

CONCLUSION

Our space systems are the envy of the world. Our infrared surveillance satellites are able to detect missile launches anywhere in the world; no other nation can do that. Our strategic communications systems allow the President precise and assured control over nuclear forces in any stage of conflict, and our wideband SATCOM systems rapidly transmit critical information between the continental U.S. to our front line forces; no one else has global, secure, anti-jam communications. Our weather satellites allow us to accurately predict future conditions half a world away as well as in space. Our GPS constellation enables position knowledge down to centimeters and timing down to nanoseconds; no one else has deployed such a capability. These sophisticated systems make each deployed soldier, sailor, marine, and airman safer, and more capable.

In the fiscal year 2010 budget, continuity of service across our space portfolio and improved space protection is paramount. Our 'back to basics' strategy over the recent years is demonstrating results, as we continue toward securing the world's best space capabilities today and ensuring the same for our Nation's future.

The space constellations and the space professionals that deliver these capabilities are our critical asymmetric advantage. We must ensure the recapitalization and health of these constellations and continue the professional development of our future space leaders. Delivering space capabilities is complex, challenging, costly, yet rewarding. Although we have faced significant challenges, we are also making significant progress. I am honored to represent a dedicated cadre of space professionals who are delivering space capabilities that support our deployed warfighters, our allies, and our Nation.

I look forward to continuing to work with this committee and thank you for your continued support of military space programs.

STATEMENT OF GEN. C. ROBERT KEHLER, USAF, COMMANDER, AIR FORCE COMMAND

[The prepared statement of General Kehler follows:]

PREPARED STATEMENT BY GEN. C. ROBERT KEHLER, USAF

INTRODUCTION

Mr. Chairman, Senator Vitter and distinguished members of the subcommittee, it is an honor to appear before you today as an Airman and as the Commander of Air Force Space Command (AFSPC).

I am proud to lead and represent the nearly 40,000 Active Duty, Guard, and Reserve airmen; government civilians; and contractors who assure strategic deterrence and deliver space-based capabilities to United States Strategic Command (USSTRATCOM), Joint Force Commanders, the Services, the Intelligence Community, civil agencies, commercial entities and allies. The men and women of AFSPC serve around the globe from AFSPC Headquarters, 14th Air Force (14 AF), 20th Air Force (20 AF), the Space and Missile Systems Center (SMC), the Space Innovation and Development Center (SIDC), and a host of deployed and forward locations.

This has been an exciting and eventful year for AFSPC. Within the Air Force, we witnessed two historic decisions in 2008: the assignment of cyberspace responsibilities to AFSPC and the establishment of Air Force Global Strike Command (AFGSC). While in the midst of implementing these decisions for the nuclear and cyberspace missions, reinvigorating the Air Force's Nuclear Enterprise remains the highest priority for the Air Force and Air Force Space Command.

Our mission is to provide an integrated constellation of space and cyberspace capabilities at the speed of need, and our vision is to be the leading source of emerging and integrated space and cyberspace capabilities. At AFSPC, we look forward to assuming the lead role for cyberspace within the USAF. Air Force operations in the air, space, and cyberspace domains are mutually-supporting and reciprocally-enabling; the cyberspace domain is inextricably linked to the other domains in which the U.S. military operates. Not only must we protect these domains, we must also properly integrate them with the other operational domains to create joint warfighting effects significantly greater than the sum of the parts. Our capabilities are woven through Joint operations, weapons networks, and civil and economic activities ranging from missile warning to the position, navigation, and timing signals we provide both for military use and as a free, international utility.

Space and cyberspace capabilities shape the American approach to warfare, are embedded in an ever-more effective arsenal of modern weaponry and are threaded throughout the fabric of our warfighting networks. Our space-based capabilities are

absolutely vital to the joint fight. Yesterday's irregular warfare is today's regular warfare; asymmetric warfare is the new norm. Space capabilities contribute across the spectrum of regular and irregular combat and non-combat operations and provide Joint commanders a decisive advantage. Space is no longer just the high ground; it is a critical joint enabler and force multiplier.

The airmen of AFSPC provide land-based strategic deterrence through our Intercontinental Ballistic Missile (ICBM) fleet led by 20 AF, conduct space operations and acquisition via 14 AF and SMC, and will soon execute cyberspace operations as part of the future 24 AF. These missions are being accomplished by our space professionals every day at 15 wings and 44 locations spanning the globe. It is my distinct pleasure to outline the strategic way forward for AFSPC and to describe for you our plan to develop, acquire, employ and execute Air Force space, missile, and cyberspace capabilities in an increasingly complex, dynamic and challenging global environment. The space, nuclear, and cyberspace capabilities acquired with your help and support, and delivered by AFSPC airmen, will help maintain America's freedom, security, and prosperity.

THE WAY FORWARD

AFSPC activities in 2008 included comprehensive, concerted efforts to deliver space and missile capabilities, develop and care for our airmen and their families, and encourage collaboration across the space enterprise. In addition, we made significant progress in modernizing our force and made great strides toward improving our acquisition processes with new strategies and actions. AFSPC is proud of its 2008 achievements; achievements that will serve as building blocks towards progress in 2009. AFSPC's strategic way forward will focus on delivering the space, nuclear, and cyberspace capabilities our Joint Force Commanders require today and into the future. To do this, we have outlined five goals that serve to guide our efforts.

AFSPC Goal: Guarantee a Safe, Credible, Ready Nuclear Deterrent Force with Perfection as the Standard

To support the Air Force's priority of "Reinvigorating the Air Force Nuclear Enterprise," AFSPC will guarantee a safe, credible, ready, nuclear deterrent force with perfection as the standard. Nuclear deterrence remains the ultimate backstop of U.S. security, dissuading opponents and assuring allies of America's military commitment to defend our Nation, its allies and friends. Our Nation's security relies heavily on the remarkable attributes of the ICBM force and the dedication and professionalism of those who proudly secure, maintain, and operate the Minuteman III weapon system. Over the course of 2009–2010, we will meet daily USSTRATCOM operational requirements; invest in sustainment, infrastructure, and our industrial base; continue to restore our nuclear culture; and transition the ICBM force to Air Force Global Strike Command.

In response to feedback and direction from the Secretary of Defense, Air Force Blue Ribbon Panel, Defense Science Board, Admiral Donald Investigation and others, we undertook a comprehensive set of actions to address deficiencies and re-establish excellence across the Air Force nuclear enterprise. Our roadmap, "Reinvigorating the USAF Nuclear Enterprise," is the strategic plan to restore a culture of discipline, establish clear organizational structures, and increase investment in critical operational and sustainment areas. Perfection, precision, and reliability are our performance standards. In recent months, all of our missile wings have undergone rigorous Nuclear Surety Inspections (NSI) to ensure the utmost standards—and all three wings satisfactorily passed their follow-on inspections.

As for the Minuteman III fleet, we are within 2 years of completing an extensive 10-year sustainment effort. As part of this comprehensive initiative, all three solid propellant motor stages have been removed and re-poured. In addition, the guidance systems and post-boost vehicles have been replaced with current technologies. These upgrades will ensure the Minuteman III is fully operational until at least 2020.

The American people depend on the U.S. Air Force to deliver safe, credible and reliable nuclear deterrence capabilities, and we will do so. Our airmen perform the nuclear deterrence mission with pride, professionalism, and a solemn commitment to the highest standards.

AFSPC Goal: Deliver Assured Combat Power to the Joint Fight

AFSPC will continue to deliver assured combat power to the joint fight. In addition to the airmen deployed "in-place" manning ICBM launch control centers and space operations centers around the clock, in 2008 we forward-deployed nearly 4,000

AFSPC airmen to Operations Enduring and Iraqi Freedom and Joint Task Force-Horn of Africa in support of ongoing counterinsurgency operations. As a result, 49 AFSPC airmen were awarded Bronze Stars while engaged in military operations in the United States Central Command (USCENTCOM) area of responsibility. Today, we have over 1,200 AFSPC airmen continuously forward-deployed.

In an environment that's more uncertain, complex, and changing than ever before, most historic military leaders would not recognize today's irregular warfare landscape. Although our Nation and its interests must still be protected from hostile forces and strategic threats, today's security challenges are more diverse and dispersed. Emerging threats are fleeting, scattered globally, may strike anywhere, anytime, and increasingly take advantage of the space and cyberspace domains. There is a growing reliance from Joint Force Commanders on space-based capabilities to provide vital services across the global commons. Our airmen are enabling GPS signals to ensure we're putting Joint Direct Attack Munitions on targets from aerial platforms and assuring the reliability of Blue Force Tracking for soldiers on the ground. Warfighters depend on military satellite communications (MILSATCOM) in austere environments for data, imagery, and streaming video feeds from Unmanned Aircraft Systems (UAS). Today, our forces are interconnected, have world-wide cognizance, and strike with greater speed and precision than any military in history providing overwhelming and decisive results with minimal collateral damage. Our continuous need for global communications, GPS, missile warning, weather forecasting and world-wide intelligence, surveillance, and reconnaissance continues to be met by space systems in the face of evolving warfare.

In 2009–2010, we will continue to improve Space Situational Awareness (SSA), execute the Space Protection Strategy, increase GPS navigational accuracy and signal security, modernize MILSATCOM, assure and exploit new Overhead Persistent Infrared (OPIR) capabilities, and transform the launch enterprise.

Space Protection Program

Another history-making "first" occurred in March 2008 when AFSPC and the NRO established the Space Protection Program (SPP). The purpose of this program is to develop an integrated approach to protect critical defense, intelligence, civil, and commercial space systems that support national security.

In response to Congressional direction, AFSPC and the NRO delivered the first Space Protection Strategy to Congress in August 2008. The SPP strategy was approved by the Deputy Secretary of Defense and identified mission critical investments, capability improvements, and critical interdependencies. Complementing the SPP Strategy, AFSPC also finalized a new roadmap for the SSA mission area along with an interim architecture.

Space Situational Awareness

In concert with the SPP initiative, AFSPC continued efforts to develop a cost effective strategy to protect space capabilities, while striking the right balance among awareness, hardening, countermeasures, reconstitution, and alternate means. The Integrated Space Situational Awareness (ISSA) program provides USSTRATCOM, Joint Functional Component Command for Space and the joint community an integrated source of historical, current and predictive space events, threats, and space activities.

In a dramatic display of teamwork and excellence, AFSPC developed the first-ever training procedures and exercises for a real-world intercept mission, Operation Burnt Frost. We ensured personnel at the Joint Space Operations Center (JSpOC) at Vandenberg Air Force Base, CA, were properly trained and our senior leaders possessed accurate and timely location of the target satellite, potential impact locations, and possible environmental effects. During the mission, we provided a glimpse of the future by transforming the legacy "hub and spoke" space surveillance network into a collaborative, net-centric operation providing real-time SSA and sensor-to-sensor hand-offs. Through subsequent orbital tracking and cataloguing efforts, we've determined every bit of debris created from the intercept has since de-orbited.

The importance of SSA continues to grow as the space domain becomes an increasingly contested and crowded environment. Issues common to other domains remain unresolved for space. As a Nation, we have gaps in the operational space domain not found in other domains across the global commons. The Iridium collision with a Russian communication satellite is a recent example highlighting the critical need for advanced Space Situational Awareness.

Commercial and Foreign Entities (CFE) support is one of our top initiatives. The CFE Support Program was created in 2004 to focus on safety of flight in orbit for government, commercial, and foreign satellite operators in the US and around the world. Under our current pilot program, we are equipped, manned, and resourced

to provide Conjunction Assessment (CA) analysis for capabilities critical to national security and homeland defense. An ever-changing space environment continues to become further crowded with increasing amounts of debris and new entrants. This has challenged our capability in the midst of declining resources and greater demand for basic CA and advanced services.

In an effort to improve our capabilities, we are augmenting our CFE resources and communicating the expanded services to the CFE community. AFSPC will expand and automate our processing and analytical capabilities thereby enabling expanded CA services and in the fall of 2009, we will transition our CFE pilot program to USSTRATCOM to continue long-term operations and support from the JSpOC. Our goal remains to provide SSA services to legitimate and trusted CFE users ensuring space flight safety and freedom of action in space.

Schriever War Game Series

The recurring AFSPC Schriever Title 10 War Game series has proven insightful in identifying key operational and policy issues. Having just wrapped up our Schriever V War Game in March 2009, we are now reviewing key issues involving space deterrence, capability employment, and national space policy considerations with senior Air Force and other national decisionmakers. Schriever V clearly identified areas requiring additional emphasis, policy development, resources and analysis. It also demonstrated the far-reaching importance of space to combat operations, policy execution, and diplomacy. We are now underway with plans for Schriever VI, and we look forward to increased international and industry participation.

Position, Navigation and Timing

The Global Positioning System (GPS) continues to provide highly accurate position, navigation and timing signals enabling Joint combat operations around the world. GPS is a free global utility that serves as an enabler for economic transactions influencing the global economy by more than $110 billion annually. Throughout 2008, AFSPC operated the most precise, largest-ever GPS constellation and took its first big step towards deploying GPS III when we awarded a contract in May 2008 to build eight of the Block IIIA satellites. Complementing the space segment, we replaced the unsustainable legacy GPS Master Control Station ground segment with the Architecture Evolution Plan (AEP) and Launch Anomaly and Disposal Operations (LADO) Systems. AEP improves GPS accuracy, provides the capabilitiy to operate the GPS IIF satellites, and affords increased protection of the military's GPS M-code. LADO provides critical launch operations support and on-orbit operations for the GPS constellation. The transition to both the AEP and LADO system was seamless and transparent to users across the globe. In 2008, our acquisition team began developing the Next-Generation Operational Control Segment (OCX). This segment is not only required to launch and sustain GPS IIIA space vehicles on orbit, but is essential to moving the GPS towards robust, effects-based operations.

At the same time, plans are well underway to launch, deploy and begin operating the first GPS IIF space vehicle by December 2009. These new vehicles will broadcast the first operational L5 signals, thereby providing civilian users an additional, higher powered signal. This signal is protected by internationally recognized safety of life spectrum rules ensuring robust quality of service with minimal interference.

Military Satellite Communications

As our MILSATCOM capability continues to grow, so does the age of our fleet. Aged in many cases beyond their design lives, the Military Strategic and Tactical Relay Satellite (MILSTAR) and the Defense Satellite Communications System-III (DSCS–III) will have to continue to provide critical communications services for the Nation's protected and non-protected military and diplomatic activities while we deploy the next generation of advanced MILSATCOM capabilities.

With the commencement of mission operations over the first Wideband Global SATCOM (WGS) satellite in April 2008, we demonstrated a ten-fold increase in our wideband SATCOM capabilities providing the warfighter increased data, voice, video, and imagery. Additionally, we validated and accepted the geographically separated Backup Satellite Operations Center at Vandenberg Air Force Base. This $2.7 million effort supports MILSTAR, DSCS, and WGS operations.

Looking towards the future of MILSATCOM, we began preparations to accept the first Advanced Extremely High Frequency (AEHF) communications satellite in 2010. We look forward to the AEHF system as it will increase the protected communications data rate more than five-fold and afford more coverage opportunities than what MILSTAR provides today. Not only will AEHF provide enhanced national command and control satellite networks for the President, Secretary of Defense, and our

combatant commanders, it will also ensure warfighters receive critical information such as the air and space tasking orders, operational plans, and time-phased force and deployment data. We transitioned to an innovative $1.25 million operations center and began training Subject Matter Experts (SME) in preparation for our next generation satellite system. Deployment of WGS and AEHF allows us to close the gaps in the areas of volume, data rates, protected communications, and net-centricity for the warfighter and our Nation's leadership.

Intelligence, Surveillance, and Reconnaissance

The Space Based Infrared System (SBIRS) will provide the Nation with critical comprehensive missile warning, missile defense, technical intelligence, and battlespace awareness information well into the 21st century.

In November 2008, the SBIRS Mission Control System Backup—Highly Elliptical Orbit (HEO) facility and HEO–1 payload were accepted for operational use, followed by USSTRATCOM certification in December 2008. The second HEO payload is now on-orbit and undergoing checkout. The exceptionally high quality of HEO infrared data has led to additional exploitation initiatives providing major long-term benefits to our Joint Force Commanders.

As the SBIRS HEO–1 system was certified for operations and is providing critical data to warfighters, the SBIRS Geosynchronous Earth Orbit (GEO–1) and GEO–2 space vehicles made significant assembly, integration and test progress. We will continue satellite testing and integration and look forward to launch readiness testing in fiscal year 2010.

The future of OPIR is the Third Generation Infrared Satellite currently undergoing research and development. In 2009–2010, we will continue down the path of wide field of view technology maturation activities. We have received wide field of view sensor prototypes and are on contract for a scientific experiment on a commercial rideshare mission in 2010.

Space Control

As the Air Force enters its 18th year of continuous combat operations in the Persian Gulf, AFSPC continues to provide sustained counterspace capability to USCENTCOM and is in its fifth year of continuous presence in theater with the defensive counterspace system—Silent Sentry. The resounding success of the Silent Sentry has led to the Rapid Attack Identification Detection and Reporting System (RAIDRS) Block 10 program, which detects and geolocates satellite communications interference via fixed and transportable ground systems.

Operationally Responsive Space

The Operationally Responsive Space (ORS) program is also focused on the joint fight. AFSPC partnered across the space enterprise and responded to three urgent warfighter needs in communications, SSA, and ISR. We addressed the warfighters' requirements through a variety of innovative approaches to include: accelerated delivery of demonstration efforts, explored alternative uses of on-orbit capability, expanded use of commercial assets, and military utility experimentation with a tactical communications satellite. In addition, we began development of ORS Sat–1 to meet a critical USCENTCOM ISR requirement.

Launch Enterprise Transformation

Assured access to space is paramount to providing space capabilities to the warfighter. AFSPC continues to deliver 100 percent space launch mission success—one mission at a time. Within our launch community, we witnessed the continuation of our winning streak with an unprecedented string of 61 successful national security space launches including the 23rd consecutive successful launch of the Atlas V and Delta IV Evolved Expendable Launch Vehicles (EELVs). Following a 22-month, $300 million launch site modification effort, the first west coast Atlas V successfully delivered a critical NRO satellite into orbit. We recently launched the GPS IIRM–20 onboard a Delta II in March, as well as the second WGS satellite in April onboard an Atlas V. Additionally, AFSPC supported two world-wide tests of the Ground-based Mid-course Defense long-range missile interceptor system.

In a broader context, AFSPC continues to advance our Space Launch Enterprise Transformation (LET) effort to posture our command for the future of assured access to space. The LET focuses on three initiatives: transformation of launch services acquisition, upgrading the launch range architecture, and fully leveraging Total Force Integration (TFI). While the military launch business has long been recognized as a key contributor to space, we understand the significance of fostering the growth of commercial launch capabilities.

AFSPC Goal: Forge a Battle-Ready Team by Attracting, Developing and Retaining America's Best

To support the Air Force's priority of "Developing and Caring for Airmen and Their Families," AFSPC is forging a battle-ready team by attracting, developing and retaining America's best. During 2009–2010, we will improve training and professional development programs, establish viable career pathways, and guarantee quality of life programs for our members and their dependents. We are taking the necessary steps to care for our airmen and their families. While we undertake comprehensive organizational realignment, AFSPC is working hard to ensure a seamless transition of the land-based nuclear deterrent to Air Force Global Strike Command and to establish processes for deliberate development of nuclear expertise among our ICBM professionals. At the same time, we're preparing for the integration of the cyberspace mission by carefully crafting a professional development program that guarantees appropriate education, training and skill sets for this unique and challenging mission area and its synergies with our space professionals.

Developing Airmen

AFSPC further defined space and missile training as well as professional qualification and development relationships with Air Education and Training Command allowing us to focus on our Organize, Train and Equip (OT&E) activities. Contributing to our educational efforts, the National Security Space Institute (NSSI) continued to enhance its reputation as the center for top-quality space education and training for students of all ranks across the Department of Defense and related government agencies. In 2008, the NSSI taught 77 courses to over 1,500 students. We also established an ICBM Advanced Course at the NSSI providing 2 weeks of mission-focused education for the operations, maintenance, security and helicopter personnel who operate, sustain and secure our ICBM force. Furthermore, we institutionalized attendance at the Air Force Nuclear Weapons Center's Nuclear Management Fundamentals Course for all inbound commanders who will serve at our nuclear units, and we are developing a focused ICBM Weapons Instructor Course (WIC) at the USAF Weapons School (USAFWS) at Nellis Air Force Base, NV.

Families and Quality of Life

AFSPC recognizes the critical roles our families play as integral members of the Air Force team. In AFSPC, we extended the Air Force's wingman culture to our families to help nurture success on the home front. AFSPC aggressively improved the quality of life where airmen work and live by awarding $143 million in 2008 for a host of revitalization initiatives to include family housing, a dormitory, and child development center. In addition, American Recovery and Reinvestment Act stimulus funds of $145.5 million are being invested across the command for modernization of base infrastructure and military construction (MILCON). For 2009, we have $31.5 million in MILCON projects for dorm renovation, facilities construction, and other key projects across the Command.

AFSPC Goal: Modernize and Sustain AFSPC's Enduring Missions and Mature Emerging Missions

To support the Air Force's priority of "Modernizing Our Air and Space Inventories, Organizations and Training," AFSPC will modernize and sustain AFSPC's enduring missions and mature emerging missions. Throughout 2009–2010, we will transition cyberspace capabilities to AFSPC and standup a new operational Numbered Air Force (NAF). We will also finalize a basing location and establish cyberspace training and acquisition processes through which we will present cyber forces to the Joint Force Commanders.

In 2008, AFSPC increased the depth and breadth of Air Reserve Component (ARC) support to AFSPC missions. AFSPC's first-ever TFI Strategy was developed to fully leverage the unique strengths of the ARC in both existing and emerging missions. New TFI partnerships are underway across the launch, SSA, space control, and cyberspace operational mission sets. In April 2008, we activated the 310th Space Wing at Schriever Air Force Base, CO, as the Air Force's first-ever Reserve space wing. In addition, we activated the 380th Space Control Squadron at Peterson Air Force Base, CO, as the Reserve Associate Unit for the RAIDRS mission.

AFSPC Goal: Reengineer Acquisition to Deliver Capability at the Speed of Need

To support the Air Force's priority of "Acquisition Excellence," AFSPC will reengineer acquisition to deliver capability at the "speed of need." During 2009–2010, we will continue working a "back to basics" philosophy and block-build approach, fund

to the most probable cost, increase our acquisition work force, improve relations with industry, and control requirements. Our Space and Missile Systems Center will deliver five major new systems and mission capabilities in the next 6 to 24 months for SBIRS, AEHF, WGS, GPS IIF, and the Space-Based Space Surveillance (SBSS) system. The GPS III and OCX programs are on the right vectors for success, and we are improving our space development expertise, processes and culture.

In today's world of rapid technological advancement and proliferation, we cannot afford to do business as usual when it comes to delivering space capabilities. The nature of warfare, as influenced by the information age, has changed dramatically in terms of symmetry, ambiguity, time, distance, and boundaries. This environment requires a paradigm shift necessary to deploy space capabilities at the "speed of need" while still executing efficient acquisition practices.

CONCLUSION

Defending the United States of America and its allies and friends is a continuous mission that requires the utmost planning and execution. As technology advances, so do the means that can be employed by those who threaten our way of life. AFSPC seeks to perfect the most formidable, capable and remarkable military space, missile and cyberspace force the world has ever known. This will allow warfighting commands to meet the challenge of protecting the American people, their livelihoods and interests with precision at the moment of need. With the continued support of Congress, AFSPC is postured to maintain a crucial leadership role as we realize our vision to be the leading source of emerging and integrated space and cyberspace capabilities.

STATEMENT OF LT. GEN. LARRY D. JAMES, USAF, COMMANDER, 14TH AIR FORCE, AIR FORCE SPACE COMMAND AND COMMANDER, JOINT FUNCTIONAL COMPONENT COMMAND FOR SPACE, UNITED STATES STRATEGIC COMMAND

[The prepared statement of Lieutenant General James follows:]

PREPARED STATEMENT BY LT. GEN. LARRY D. JAMES, USAF

Mr. Chairman, Ranking Member Vitter, and distinguished members of the subcommittee, I am honored to be here today for my first opportunity to appear before you as United States Strategic Command's (USSTRATCOM) Commander of the Joint Functional Component Command for Space (CDR JFCC SPACE).

It's a distinct privilege to address you on our space posture, and to represent the men and women of JFCC SPACE who employ space capabilities around the globe every day. These soldiers, sailors, airmen, and marines are a dedicated and innovative joint force, working hard to ensure efficient and effective space operations. Their professionalism ensures our joint forces can exploit space-based capabilities to the maximum extent.

Today I will focus my discussion on employment of space capabilities, the events shaping our future planning, and identify some of the challenges we face as we work to operate effectively and safely in an increasingly complex and congested space environment.

EMPLOYMENT OF SPACE CAPABILITIES

USSTRATCOM provides space effects to Department of Defense (DOD) global users that are critical to military operations. CDR JFCC SPACE is designated by CDRUSSTRATCOM as the single point of contact for military space operations. As such, I am tasked to provide tailored, responsive, local, and global space effects to the various combatant commanders. My USSTRATCOM-delegated authorities include Global Space Coordinating Authority, which makes me the primary interface with supported joint commanders for operational-level planning and execution to provide space effects in support of those combatant commanders' objectives. CDR JFCC SPACE also is assigned Operational Control and Tactical Control authorities for designated worldwide space forces. These authorities provide USSTRATCOM a single, globally focused component commander to enhance functional integration of space capabilities for the joint warfighter and for the Nation.

Every significant military operation uses space capabilities in some way—space capabilities are truly integral to military operations in the 21st century. The criticality of space effects to the warfighter is readily apparent in ongoing operations in Afghanistan where Global Positioning System (GPS) services provide foundational data, enabling us to track the location of U.S. and coalition forces. But it is not just

Blue Force Tracking; for the military users, there are multiple examples of space-based successes.

For example, precision accuracy of the GPS-guided Excalibur artillery rounds have enabled the U.S. Army to strike top al Qaeda operatives in close proximity to our infantrymen, without exposing soldiers to undue risk. On 27 March 2009, following an enemy ambush against a coalition unit, a B–1B Lancer used GPS-guided 500 lb. bombs to destroy a series of enemy fighting positions and a fortified heavy machine gun position near Tarin Kowt, Afghanistan. On 26 April 2009, four F/A–18 Super Hornets flown from the deck of the Eisenhower Carrier Strike Group delivered four 500 lb. GPS-guided JDAMs onto enemy fortified compounds and machine gun fighting positions, ending a fire fight with coalition forces. Clearly, the GPS constellation enables our forces worldwide to maneuver into a militarily advantageous position and then, through various GPS-aided munitions, exploit that tactical advantage to create effects ranging from tactical to strategic.

Our military satellite communications capabilities provide ample, readily accessible bandwidth, delivering joint warfighters secure military communication, and enabling the free-flow of battlespace characterization data and critical intelligence. The recent introduction of Wideband Global Satellite Communication operations boosted area of responsibility communications tenfold for 140,000 warfighters. Wideband satellites allowed theater commanders to rely on real time, high-capacity broadcast video feeds from Predators to enhance their execution of tactical battlespace management, and to providecombat support information for deployed forces.

Our space-based missile warning systems were absolutely essential to providing tracking and assessment of the latest Taepo-Dong 2 (TD–2) missile launch from North Korea. Multiple space-based missile warning systems provided initial launch detection, enabling rapid threat/non-threat characterization, and confirming the event as a space launch. Clearly, space-based assets provide critical data to produce effects for successful military operations across a multitude of engagements. Strong communication links, operational relationships, and reach back to the Joint Space Operations Center (JSpOC) ensure USSTRATCOM is able to provide users the effects they need.

Space capabilities are no longer just the province of large nations. Access to space and space products becomes cheaper and more widely available every year. The commercialization of space has allowed many developing nations and non-state actors to acquire space-based capabilities, such as imagery and satellite communications, that were previously the exclusive purview of superpowers. With more space players, space is more crowded than ever. In 1980 only 10 countries were operating satellites in space. Today, 9 countries operate spaceports, more than 50 countries own or have partial ownership in satellites and citizens of 39 nations have traveled in space. In 1980 we were tracking approximately 4,700 objects in space; 280 of those objects were active payloads/spacecraft, while another 2,600 were debris. As of 1 May 2009 we are tracking approximately 19,900 objects; 1,300 active payloads and 8,700 pieces of debris. In 29 years, space traffic has quadrupled. We have already seen one catastrophic collision in space with the Iridium/COSMOS conjunction, and as the number of objects in space increase, so do the chances of another collision. Clearly, managing this environment and our assets is a key focus of our efforts.

KEY EVENTS OF 2008/2009

Although we have made progress in improving our space situational awareness (SSA), February's unfortunate collision between an active Iridium communications satellite and an inactive Russian satellite, and last month's test of another North Korean TD–2 missile, continue to tangibly demonstrate the complexity of the environment, the challenge of emerging space faring nations, and the demands on our space systems. To date we have cataloged over 940 pieces of debris that resulted from the Iridium/COSMOS collision and there are likely thousands of smaller pieces our sensors can't track. Only 18 items of debris have reentered so far, with the remainder expected to be in orbit for decades. This debris will slowly decay due to natural forces, but it will remain a hazard to manned and unmanned spaceflight in low Earth orbit, and to satellites transiting that region, for several years.

We've derived many lessons from the TD–2 missile event, chief among them the requirement to integrate and fuse many sources of space, ground and intelligence data, in many disparate systems and security channels. This is a lesson we identified during the 2007 Chinese anti-satellite (ASAT) test, and experienced again during the 2008 NRO satellite intercept, and although we have implemented tactics, techniques, and procedures to mitigate potential delays in information flow, the

challenge of collecting, integrating and fusing this data still exists. It again took the significant efforts of many to manually assemble information and then pass it to senior decision makers. While we were very successful once again due to outstanding cooperation between the intelligence and operations communities, we clearly need improved processing and analytic systems that can continually compile and automatically fuse SSA, intelligence and other all-source information in real-time to keep us abreast of space events. Our lessons learned from the TD–2 test will continue to guide future improvements and our developmental efforts for the JSpOC to ensure USSTRATCOM is able to provide users the effects they need.

However, collisions and space traffic growth are not the only challenges or threats to our space assets. The January 2007 Chinese test of an ASAT demonstrated the kinetic kill capability of space assets and this capability will continue to be a threat in the future. Even more ubiquitous is the capacity to jam satellite communications links; this is within the capability of many nations, as well as non-state actors. Space-related ground sites can be damaged by direct attack. Several nations are working on high-energy lasers that could damage or destroy our satellites. With the exception of the high-energy laser, all of these threats to our space systems exist today. Our Nation's growing dependence on space-based capabilities, coupled with the increasing threats and operational risks we face, creates corresponding potential military and economic vulnerabilities. We must protect our space assets against intentional and unintentional acts in order to preserve our essential space capabilities, and accordingly, we must change our mindset from passive to active protection measures to ensure USSTRATCOM's ability to execute and integrate operations across all lines of operations.

SPACE SITUATIONAL AWARENESS

Space situational awareness is more than understanding the space environment, tracking objects, and conducting conjunction assessments. We need to be able to discriminate between natural and manmade threats. We need to understand the location, status and purpose of these objects, their capabilities, and their owners' intent. This comprehensive knowledge enables decision makers to rapidly and effectively select courses of action to ensure our sustained freedom of action and safety in what is clearly a contested space environment.

The U.S. space surveillance architecture currently detects and tracks thousands of objects, but critical gaps remain in our ability to fully track and characterize all on-orbit objects, analyze and predict conjunctions, and protect not just military satellites, but also the commercial and civil satellites that are critical to national security. The Space Surveillance Network provides acceptable coverage in the northern hemisphere, but we have a significant coverage gap in the southern hemisphere. By filling this gap we increase the JSpOC's ability to rapidly detect, track, and characterize new payloads and maintain awareness of maneuvering spacecraft.

Our sensor network is currently able to track objects as small as 10 centimeters across. We do this well for low Earth orbits; however, our ability decreases as we track objects in the more distant geosynchronous orbit. We need to improve our capability to track and assess smaller objects in all orbits if we are to keep pace with the potential threats from emerging small satellite technologies, and to gain better awareness of the hazards posed by small space debris.

We must sustain the momentum gained through investments such as the Space Fence and Space-base Space Surveillance system and strive to close SSA gaps, bringing us ever closer to combining an operational picture of space with command and control systems, and moving us from "watching and reacting" to "knowing and predicting" in the space domain.

INTELLIGENCE, SURVEILLANCE, AND RECONNAISSANCE

Obtaining intelligence of other nations' intentions in space is a particularly challenging issue. Our Intelligence Community is working towards building the necessary foresight to improve our ability to anticipate what others may do in space, whether to use the space environment to benefit their military operations, terrorist attempts, or to deny the U.S. space-provided services which we have grown dependent on.

Improved analytic systems and connectivity will help us fuse operations and intelligence data. Backing that up must be a cadre of space intelligence experts, both within the Intelligence Community (IC) and within the JSpOC, who can readily focus and apply information to support our command and control activities, and ultimately provide necessary support to the warfighter. The DOD, IC, and National Air and Space Intelligence Center are working together to improve systems and develop

our intelligence experts. These efforts are a tremendous start, but must remain a priority in order to provide near real time, actionable intelligence to the warfighter.

Furthermore, we have barely begun to scratch the surface in terms of the potential data to be exploited from current and future space systems. Air Force Space Command (AFSPC) has recognized this need and formed a Battlespace Awareness and Technical Intelligence Capability Team to develop the exploitation and dissemination systems, processes and architecture that will allow us to more fully integrate AFSPC sensor capabilities with those of the rest of the Air Force, our sister Services, and the IC, to provide multi-source intelligence from DOD space-based sources to support joint warfighters and national decisionmakers. We fully endorse these efforts and are partnering closely with AFSPC to prepare ourselves for the key role JFCC SPACE will play in commanding and tasking these assets.

SPACE AND CYBERSPACE INTEGRATION

Emerging threats may originate anywhere, at anytime, and increasingly take advantage of space and cyberspace domains. Global effects, speed of attack, availability of information, and the ability to strike from remote locations are common attributes across both domains. As such, our adversaries have unprecedented, immediate access to information utilizing minimal resources. Space and cyberspace are truly contested domains, and our Nation's critical information is more vulnerable than ever and must be protected.

Space and cyberspace capabilities continue to shape the world's approach to warfare. They are embedded in an increasingly, diverse arsenal of modern weaponry, and are threaded throughout warfighting networks. When integrated, space and cyberspace operations will become an even more powerful force multiplier. We must take actions to integrate space and cyberspace operations to protect the United States' freedom of action and information.

We will continue to face many challenges in space and cyberspace. To ensure their integration, we must take the same operational mentality we have of the space environment and apply this mindset to cyberspace.

COMMAND AND CONTROL

JFCC SPACE commands and controls worldwide space forces to ensure space-based effects meet warfighter needs. To ensure we can continue to effectively support the warfighter and senior decisionmakers, we require more automated, net-centric capabilities to command and control space forces, and networked sensors and information systems that seamlessly share information to more effectively leverage our current resources. This will give us the ability to rapidly react via real-time dataflow to the JSpOC for processing and analysis, and then real-time flow of the refined product back to the user.

We are aggressively pursuing command and control capabilities to consolidate intelligence information, predict adversary threats to U.S. space systems, improve our ability to monitor assigned and attached force status, and predict impacts to operational users due to system outages. Together, these capabilities provide a predictive knowledge of the space operating environment and impacts to operations, as well as enable a broader set of options to proactively posture U.S. space forces to mitigate threats.

The U.S. must continue to lead the community of space-faring nations and encourage responsible behavior in all facets of space operations. The JSpOC is the focal point for ensuring safe, effective operation of our space forces and those of our partners. We need to gather real-time, quality data, have the ability to exploit that data rapidly and accurately, and then export decision-quality information across a range of customers from the intelligence community to deployed forces to produce effects for the warfighter in an integrated, holistic way.

Finally, we must continue to focus on capability requirements of the joint warfighter. Matching future users' requirements with technological advances will allow USSTRATCOM to provide the most advanced and reliable space effects in response to the growing demands of the Nation's warfighters.

CONCLUSION

The nature of space operations is rapidly evolving, as is the United States' and coalition partners' dependence on space. While we continue to exploit current space-based capabilities to the maximum extent, we still need increased efforts to close intelligence and SSA gaps, and increased efforts to enhance our command and control capabilities, ensuring USSTRATCOM's ability to continually provide the right effect, to the right user, at the right time anywhere on the globe. Working in collaboration with other departments and agencies in the U.S. Government, the DOD

must continue to build the relationships, processes, and capabilities within the global space community that allow us to operate effectively together to meet our national security objectives. I am truly honored to lead such a talented group of men and women. Perfection is our standard and you can be proud of your soldiers, sailors, airmen, and marines that expertly tackle the challenges we face every day. I thank the subcommittee for your continued strong support as we work to preserve our vital space capabilities for our Nation.

STATEMENT OF VADM HARRY B. HARRIS, JR., USN, DEPUTY CHIEF OF NAVAL OPERATIONS FOR COMMUNICATION NETWORKS

[The prepared statement of Vice Admiral Harris follows:]

PREPARED STATEMENT BY VADM HARRY B. HARRIS, USN

Mr. Chairman, distinguished members of the subcommittee, as the Deputy Chief of Naval Operations for Communication Networks, I am honored to appear before you today to address your Navy's space activities. Let me begin by thanking Congress for its sustained and significant support to the men and women in our Armed Forces. I am the Navy's resource sponsor for space; in that capacity, I am responsible for funding Navy space programs. This sponsorship includes the Mobile User Objective System (MUOS), which is the next generation Ultra High Frequency (UHF) Satellite Communication system. MUOS will provide more capable tactical communications to our joint, mobile warfighter. I am also responsible for developing the Navy Space Strategy, writing the Navy's Space Needs letter, and supporting the Navy Space Cadre.

If I had to summarize my testimony to you today in a one sentence sound bite, it would be that the Navy is critically dependent on space to conduct not only our wartime mission, but also our core capabilities of forward presence, deterrence, sea control, power projection, maritime security, humanitarian assistance, and disaster response. A day without space is a long day, indeed. A wide array of national, joint, and commercial satellites currently provides Navy commanders with essential worldwide communication capabilities; navigation; missile warning; meteorological data; and over-the-horizon intelligence, surveillance and reconnaissance. Although the Navy is one of the largest 'users' of space in DOD, we rely on the Air Force and the Intelligence Community to develop and field the majority of our space systems.

NAVY SPACE STRATEGY

Let me now address the Navy Space Strategy. One of the Navy's primary goals is to shape the outcome of joint deliberations on future space capabilities to maximize naval combat effectiveness. Within the Navy, space-related functions and responsibilities are distributed among different commands, which together constitute a functional "Navy Space Team" that works collaboratively to advance our many goals in space.

In 2008, the Chief of Naval Operations published the Navy Space Strategy, which provides key elements and guidance to implement the DON Space Policy. The Navy Space Strategy focuses on two broad themes. First, to influence the large DOD and national investments in space systems through direct, active participation in the National Security Space enterprise. Second, to leverage DOD and national space resources through improvement of the integration of space systems capabilities into the Navy's combat systems. Our strategy addresses five key goals: (1) mitigating the impact of the risk that adversaries pose to critical space systems upon which the Navy depends; (2) identifying, documenting, and advocating Navy's specific requirements for future space systems; (3) posturing the Navy Space Cadre to ensure we place the right person in the right job at the right time; (4) prioritizing and funding essential science, technology, research and development efforts to meet Navy's needs in space; and (5) expanding Navy leadership engagement with senior Department of Defense, Joint, and National Intelligence Community space leaders to better advocate for, and positively influence, Navy issues in space.

Your Navy is actively engaged with key national and joint space-related organizations to ensure current and future Navy needs in space are identified. Venues for this engagement include the DOD Space Posture Review, the Quadrennial Defense Review, and National Security Space Program assessments.

A specific example of this is our active participation with other Services and the intelligence community in addressing the current and future electro-optical satellite architecture. Secretary Gates' and Director Blair's recent decision on electro-optical

modernization validates the importance these systems play in our national security. Through this modernization we will create an enabling collection of capabilities to support current and future naval operations. In addition, we continue to assess the military utility of commercial sensing capabilities to support our current operations worldwide. For example, within the Sixth Fleet area of responsibility we are currently looking at the value of commercial sensing to support Theater Security Cooperation and Maritime Domain Awareness.

Navy is also working with the newly established Space Protection Program sponsored by Air Force Space Command and the National Reconnaissance Office.

ULTRA HIGH FREQUENCY NARROWBAND SATELLITE COMMUNICATIONS

The Navy's major space segment responsibility to the joint community is the UHF narrowband satellite communications constellation. Today this constellation consists of eight UHF Follow-On satellites, two residual Fleet Satellites (FLTSAT), one Leased Satellite (LEASAT 5), and leased capacity on SKYNET 5C. The MUOS will begin to replace these systems in 2011.

MUOS, which is designated as a Major Defense Acquisition Program, is the next generation UHF satellite constellation; it will consist of four operational satellites and an on-orbit spare. MUOS will support Unified Commands and Joint Task Force Components, DOD and non-DOD agencies, and allied and coalition users. With both a legacy UHF payload that provides the same capability as the current UHF Follow-On satellite, and a new UHF waveform payload, MUOS will significantly increase the number of accesses and throughput available to the warfighter by more than an order of magnitude while retaining backward compatibility with legacy UHF terminals. It will provide tactical narrowband netted, point-to-point, and broadcast services of voice and data worldwide in challenging environments including double canopy foliage, urban environments, and high sea states, as well as mitigate threats to deny use of the satellite.

MUOS is critical to satisfying the demand for tactical satellite communications. During Operations Enduring Freedom and Iraqi Freedom, the UHF system (UHF Follow-On, FLTSAT, and LEASAT 5) was only able to support 20 percent of the narrowband tactical UHF satellite communication capability requested by operators even though 80 percent of the capacity was devoted to these operations. LEASAT 5 will reach its end of service life in early 2011, and the UHF Follow-On constellation is predicted to reach an unacceptable level of availability in May 2010. The good news is that the FLTSAT and UHF Follow-On satellites are operating well past their design lives—we are getting every bit of our investment out of them . . . and then some. In order to minimize the operational impact of any gap in UHF satellite availability, we are executing a mitigation plan, and developing further paths to maximize system capability until MUOS satellites and MUOS-capable terminals come online. We have increased the use of leased commercial bandwidth on LEASAT 5, and have recently added a lease on Skynet. One of our major mitigation efforts involves the maximization of available satellite communications channels on the newest UHF Follow-On satellite. The program office for UHF Follow-On took advantage of the satellite's digital capability and component redundancy to allow use of 10 additional channels, beginning 5 months ago in December 2008. This was achieved at virtually no cost. Similar gains may be possible on the legacy payload that MUOS satellites will carry, once on orbit. We are now exploring this option as part of our effort to maximize accesses during the transition from legacy to MUOS-capable terminals. The MUOS advanced waveform will deliver capabilities such as increased capacity, higher data rates, and ability to operate with smaller terminals. The fielding of MUOS-capable Joint Tactical Radio System terminals, and/or the upgrade of existing UHF legacy software-programmable terminals, are required for the use of this new MUOS capability.

Today, the UHF Follow-On satellite supports approximately 600 simultaneous accesses worldwide. Based on evolving warfighting concepts in support of the Guidance for Development of Forces, UHF satellite communications requirements are expected to grow, and MUOS, as designed, will be able to support that requirement.

The MUOS program office currently projects a schedule delay to satellite #1's on-orbit capability, from March 2010 to no earlier than February 2011. The prime contractor has experienced challenges with two of the key pieces of technology. Several challenging technical hurdles still remain, including final satellite assembly and certification. The program office has been aggressively addressing and mitigating cost and schedule issues.

The delivery of MUOS is a high priority for Navy. Warfighters need MUOS not only for the advanced capabilities that it will provide, but also for the warfighter-

critical legacy payload, which will replenish our rapidly aging UHF Follow-On constellation.

OPERATIONALLY RESPONSIVE SPACE

With regard to Operationally Responsive Space (ORS), satellites provide global access and are a key enabler for our Navy's worldwide missions. To maintain our asymmetric expeditionary advantage, we must be able to surge additional space-based capabilities such as intelligence, surveillance, and reconnaissance; position, navigation, timing; and satellite communications, on accelerated timelines. We must be able to add capabilities in any area of focus, as well as rapidly reconstitute lost capability. ORS solutions have the potential to fill the gaps for warfighters going in harm's way, and represent a capability which the Navy needs to maintain our operational advantage.

We are excited about the potential of the ORS concept, as it offers maritime forces the flexibility to meet critical warfighting capabilities and counter increasingly agile adversaries. As part of the joint Tactical Satellite (TACSAT) and ORS effort, the Office of Naval Research invests $15 million of science and technology funds each year in moderate-to-high-risk projects that result in significant prototypes through the Space Innovative Naval Prototype program. Investments are focused on naval capability gaps that space-based systems can fill, such as ship tracking, acoustic data exfiltration from sonobuoys, mobile communications, submarine detection, red force cueing, and littoral environment characterization. The Naval Research Laboratory is managing the ORS Payload Technology initiative for the Office of the Secretary of Defense.

TACSAT–3, which is scheduled to launch this month, includes a payload sponsored by the Office of Naval Research, which provides an IP-based data exfiltration capability to collect information from a wide variety of underwater, surface, and land-based sensors.

The Office of Naval Research and the Naval Research Laboratory are leading development of TACSAT–4 for the joint community, and funding a UHF Communications payload which will support mobile communications as well as sensor data exfiltration. TACSAT–4 uses a prototype spacecraft bus which was designed as part of a government-industry team effort to develop and mature standards for increased modularity. The TACSAT–4 spacecraft is scheduled to be launched this September. It will primarily support the U.S. Central Command Area of Responsibility, although other combatant commanders may benefit from its coverage as well.

The TACSAT series of experiments reflect the partnerships that must be developed and nurtured between the services, combatant commanders, the Intelligence community, and industry, to produce innovative solutions that leverage the best talent available across the national security space community to solve warfighting challenges.

The ORS attributes of flexibility and agility not only provide advantages in the current operational environment but also have the potential to positively affect the space industrial base. The shorter project cycles should provide a broader base of rapid response experience for the space industry and space cadre, and will establish a faster acquisition rhythm in the long run.

SUMMARY

In summary, space systems are a critical enabler for maritime operations. Your Navy has a long and proud history in space, having developed a number of technological breakthroughs. The list of Navy 'firsts' in space includes: the first space communications used for operations; the first controllable space launch vehicle; the first satellite tracking system; the first successful electronic intelligence reconnaissance satellite; the first space object tracking system; the first demonstration of on-orbit atomic clocks; the first military broadcast satellite; and the first astronauts to orbit the earth, orbit the moon and crew the Space Shuttle. The Navy looks forward to more innovative space "firsts" to come in the decades ahead.

The Navy's mission of keeping air and sea lanes open and ensuring the security of our citizens at home and abroad requires a global reach and persistent presence. We must be constantly ready, whether it is to deliver on a mission of mercy on one hand, or more lethal measures in combat on the other . . . and everything in between. Our ability to respond, as well as work with our Sister Services and coalition partners, depends on space capabilities with inherent flexibility and speed to support our worldwide responsibilities.

The Navy must leverage DOD's and the intelligence community's space capabilities and must be involved in future space developments to ensure our ability to successfully conduct maritime operations. Future U.S. satellite programs are now being

developed that promise additional benefit and capabilities to Navy warfighters. Due to the long lead times involved in complex space programs, it is even more critical that naval requirements and maritime missions continue to be factored into the prelaunch design and planned on-orbit operation of all future satellite systems being considered for acquisition. Without active Navy involvement today in ongoing deliberations over future satellite programs, your Navy risks operating in future scenarios with space systems not optimized for the maritime environment and ill-equipped to contribute to key important issues affecting our national security.

Thank you for the opportunity to share our efforts with you today. So let me end as I began—the help of Congress in general, and this subcommittee in particular, is deeply appreciated.

STATEMENT OF CRISTINA T. CHAPLAIN, DIRECTOR, ACQUISITION AND SOURCING MANAGEMENT, GOVERNMENT ACCOUNTABILITY OFFICE

[The prepared statement of Ms. Chaplain follows:]

PREPARED STATEMENT BY CRISTINA T. CHAPLAIN

Mr. Chairman and members of the subcommittee: I am pleased to be here today to discuss the Department of Defense's (DOD) space acquisitions. The topic of today's hearing is critically important. Despite a growing investment in space, the majority of large-scale acquisition programs in DOD's space portfolio have experienced problems during the past two decades that have driven up cost and schedules and increased technical risks. The cost resulting from acquisition problems along with the ambitious nature of space programs has resulted in cancellations of programs that were expected to require investments of tens of billions of dollars, including the recently proposed cancellation of the Transformational Satellite Communications System (TSAT). Moreover, along with the cost increases, many programs are experiencing significant schedule delays—at least 7 years—resulting in potential capability gaps in areas such as positioning, navigation, and timing; missile warning; and weather monitoring.

My testimony today will focus on the condition of space acquisitions, causal factors, and recommendations for better positioning programs for success. Many of these have been echoed by the Allard Commission,[1] which studied space issues in response to a requirement in the John Warner National Defense Authorization Act for Fiscal Year 2007, and by a study by the House Permanent Select Committee on Intelligence (HPSCI),[2] among other groups. The two studies highlighted concerns about diffuse leadership for military and intelligence space efforts and declining numbers of space engineering and technical professionals. Members of the Allard Commission were unanimous in their conviction that without significant improvements in the leadership and management of national security space programs, U.S. space preeminence will erode "to the extent that space ceases to provide a competitive national security advantage."

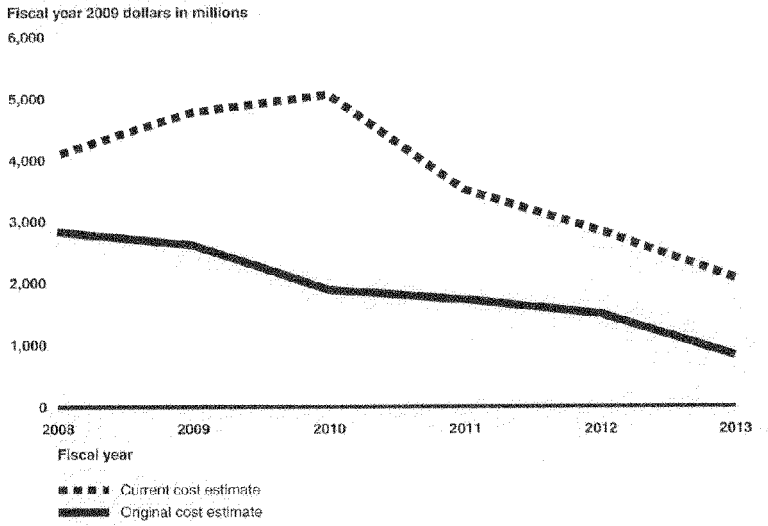
SPACE ACQUISITION PROBLEMS PERSIST

Figure 1 compares original cost estimates and current cost estimates for the broader portfolio of major space acquisitions for fiscal years 2008 through 2013. The wider the gap between original and current estimates, the fewer dollars DOD has available to invest in new programs. As shown in the figure, estimated costs for the major space acquisition programs have increased by about $10.9 billion from initial estimates for fiscal years 2008 through 2013. The declining investment in the later years is the result of the Evolved Expendable Launch Vehicle (EELV) program's no longer being considered a major acquisition program and the cancellation and proposed cancellation of two development efforts that would have significantly increased DOD's major space acquisition investment.

[1] Institute for Defense Analyses, Leadership, Management, and Organization for National Security Space: Report to Congress of the Independent Assessment Panel on the Organization and Management of National Security Space (Alexandria, VA: July 2008).

[2] House Permanent Select Committee on Intelligence, Report on Challenges and Recommendations for United States Overhead Architecture (Washington, DC: October 2008).

Figure 1: Comparison between Original Cost Estimates and Current Cost Estimates for Selected Major Space Acquisition Programs for Fiscal Years 2008 through 2013

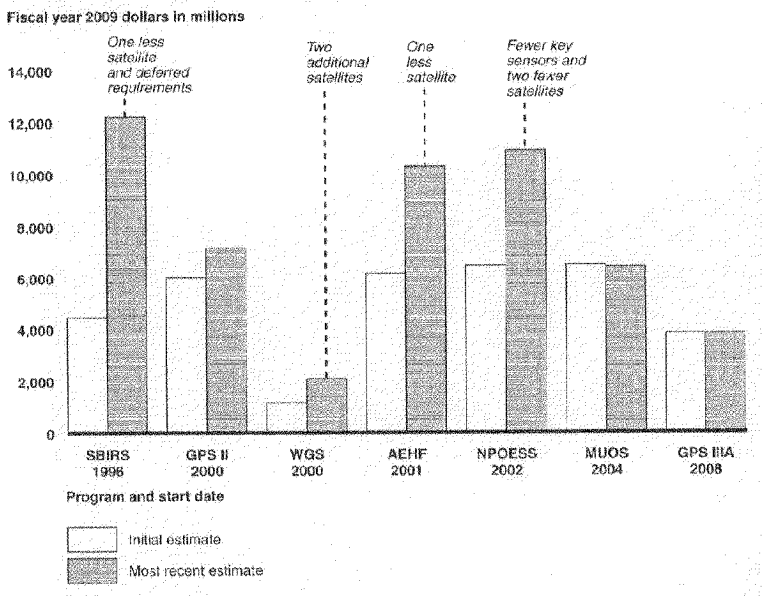


Source: GAO analysis of DOD data.

Note: The acquisition programs include Advanced Extremely High Frequency, Global Broadcast Service, Global Positioning System II, Global Positioning System IIIA, Mobile User Objective System, National Polar-orbiting Operational Environmental Satellite System, Space Based Infrared System, and Wideband Global SATCOM.

Figures 2 and 3 reflect differences in total life-cycle and unit costs for satellites from the time the programs officially began to their most recent cost estimate. As figure 2 notes, in several cases, DOD has had to cut back on quantity and capability in the face of escalating costs. For example, two satellites and four instruments were deleted from National Polar-orbiting Operational Environmental Satellite System (NPOESS) and four sensors are expected to have fewer capabilities. This will reduce some planned capabilities for NPOESS as well as planned coverage.

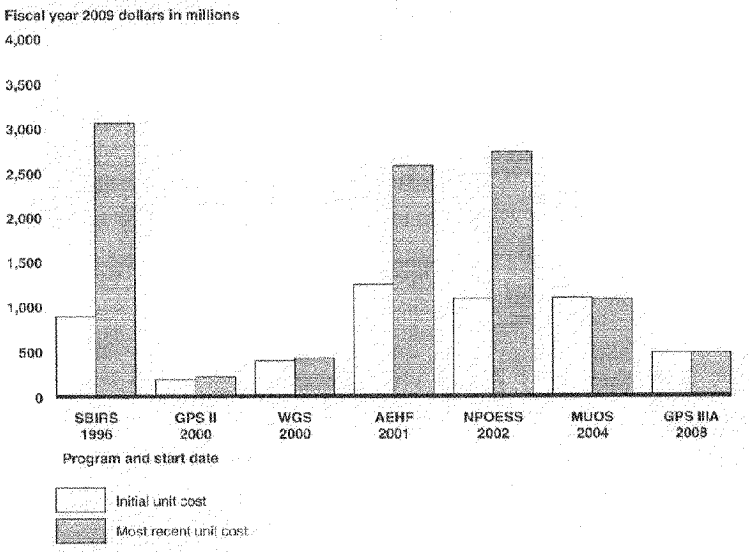
Figure 2: Differences in Total Life-Cycle Program Costs from Program Start and Most Recent Estimates



Source: GAO analysis of DOD data.

Legend: SBIRS = Space Based Infrared System, GPS = Global Positioning System, WGS = Wideband Global SATCOM, AEHF = Advanced Extremely High Frequency, NPOESS = National Polar-orbiting Operational Environmental Satellite System, and MUOS = Mobile User Objective System.

Figure 3: Differences in Unit Costs from Program Start to Most Recent Estimates

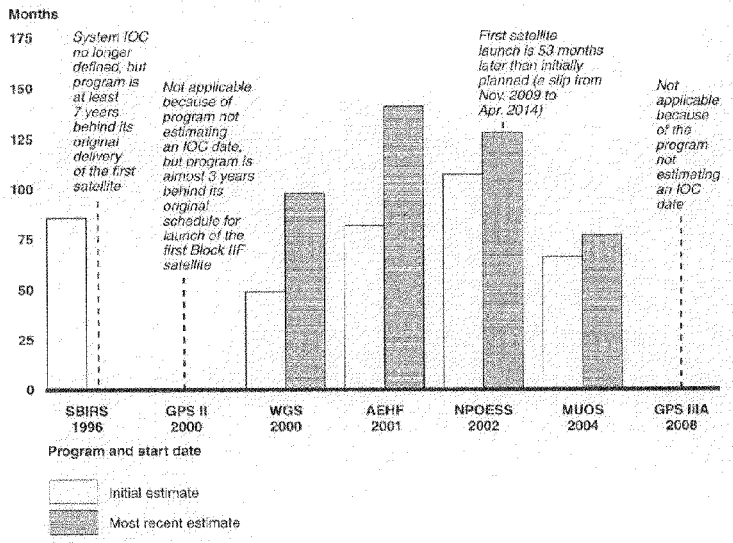


Source: GAO analysis of DOD data.

Legend: SBIRS = Space Based Infrared System, GPS = Global Positioning System, WGS = Wideband Global SATCOM, AEHF = Advanced Extremely High Frequency, NPOESS = National Polar-orbiting Operational Environmental Satellite System, and MUOS = Mobile User Objective System.

Figure 4 highlights the additional estimated months needed to complete programs. These additional months represent time not anticipated at the programs' start dates. Generally, the further schedules slip, the more DOD is at risk of not sustaining current capabilities. For this reason, DOD began a follow-on system effort, now known as Third Generation Infrared Surveillance, to run in parallel with the Space Based Infrared System (SBIRS) program.

Figure 4: Differences in Total Number of Months to Initial Operational Capability (IOC) from Program Start and Most Recent Estimates



Source: GAO analysis of DOD data.

Legend: SBIRS = Space Based Infrared System, GPS = Global Positioning System, WGS = Wideband Global SATCOM, AEHF = Advanced Extremely High Frequency, NPOESS = National Polar-orbiting Operational Environmental Satellite System, and MUOS = Mobile User Objective System.

This fiscal year, DOD launched the second Wideband Global SATCOM (WGS) satellite. WGS had previously been experiencing technical and other problems, including improperly installed fasteners and data transmission errors. When DOD finally resolved these issues, it significantly advanced capability available to warfighters. Additionally, the EELV program had its 23rd consecutive successful operational launch in May. However, other major space programs have had setbacks. For example:

- In September 2008, the Air Force reported a Nunn-McCurdy unit cost breach of the critical cost growth threshold[3] for the Advanced Extremely High Frequency (AEHF) communications satellite because of cost growth brought on by technical issues, schedule delays, and increased costs for the procurement of a fourth AEHF satellite. The launch of the first satellite has slipped further by almost 2 years from November 2008 to as late as September 2010. Further, the program office estimates that the fourth AEHF satellite could cost more than twice the third satellite because some components that are no longer manufactured will have to be replaced and production will have to be restarted after a 4-year gap. Because of these delays, initial operational capability has slipped 3 years—from 2010 to 2013.
- The Mobile User Objective System (MUOS) communications satellite estimates an 11-month delay—from March 2010 to February 2011—in the delivery of on-orbit capability from the first satellite. Further, contractor costs for the space segment have increased about 48 percent because of the additional labor required to address issues related to satellite design complexity, satellite weight, and satellite component test anomalies and associ-

[3] 10 U.S.C. § 2433 establishes the requirement for unit cost reports. If certain unit cost thresholds are exceeded (known as Nunn-McCurdy breaches), DOD is required to report to Congress and, in certain circumstances, if DOD determines that specific criteria are met, certify the program to Congress.

ated rework. Despite the contractor's cost increases, the program has been able to remain within its baseline program cost estimate.

• The first Global Positioning System (GPS) IIF satellite is now expected to be delayed almost 3 years from its original launch date to November 2009. Also, the cost of GPS IIF is now expected to be about $1.6 billion—about $870 million over the original cost estimate of $729 million. (This approximately 119 percent cost increase is not that noticeable in figures 2 and 3 because the GPS II modernization program includes the development and procurement of 33 satellites, only 12 of which are IIF satellites.) The Air Force has had difficulty in the past building GPS satellites within cost and schedule goals because of significant technical problems—which still threaten its delivery schedule—and challenges it faced with a different contractor for the IIF program, which did not possess the same expertise as the previous GPS contractor. Further, while the Air Force is structuring the new GPS IIIA program to prevent mistakes made on the IIF program, the Air Force is aiming to deploy the GPS IIIA satellites 3 years faster than the IIF satellites. We believe the IIIA schedule is optimistic given the program's late start, past trends in space acquisitions, and challenges facing the new contractor.

• Total program cost for the SBIRS program is estimated around $12.2 billion, an increase of $7.5 billion over the original program's cost, which included 5 geosynchronous earth orbit (GEO) satellites. The first GEO satellite has been delayed at least 7 years in part because of poor oversight, technical complexities, and rework. Although the program office set December 2009 as the new launch goal for the satellite, it is currently assessing the satellite launch schedule and expects to have a new plan in place by June 2009. Subsequent GEO satellites have also slipped as a result of flight software design issues.

• The NPOESS program has experienced problems with replenishing the current constellation of aging weather satellites and was restructured in July 2007 in response to a Nunn-McCurdy unit cost breach of the critical cost-growth threshold. The program was originally estimated to cost about $6.5 billion for six satellites from 1995 through 2018. The restructured program called for reducing the number of satellites from six to four and included an overall increase in program costs, delays in satellite launches, and deletions or replacements of satellite sensors. Although the number of satellites has been reduced, total costs have increased by almost 108 percent since program start. Specifically, the current estimated life-cycle cost of the restructured program is now about $13.5 billion for four satellites through 2026. This amount is higher than what is reflected in figure 2 as it represents the most recent GAO estimate as opposed to the DOD estimates used in the figure. We reported last year that poor workmanship and testing delays caused an 8-month slip in the delivery of a complex imaging sensor. This late delivery caused a delay in the expected launch date of a demonstration satellite, moving it from late September 2009 to early January 2011.

This year it is also becoming more apparent that space acquisition problems are leading to potential gaps in the delivery of critical capabilities. For example, DOD faces a potential gap in protected military communications caused by delays in the AEHF program and the proposed cancellation of the TSAT program, which itself posed risks in schedule delays because of TSAT's complexity and funding cuts designed to ensure technology objectives were achievable. DOD faces a potential gap in ultra high frequency communications capability caused by the unexpected failures of two satellites already in orbit and the delays resulting from the MUOS program. DOD also faces potential gaps or decreases in positioning, navigation and timing capabilities because of late delivery of the GPS IIF satellites and the late start of the GPS IIIA program. There are also concerns about potential gaps in missile warning and weather monitoring capabilities because of delays in SBIRS and NPOESS.

Addressing gaps in any one of these areas is not a simple matter. While there may be opportunities to build less complex "gap filler" satellites, for example, these still require time and money that may not be readily available because of commitments to the longer-term programs. There may also be opportunities to continue production of "older" generation satellites, but such efforts also require time and money that may not be readily available and may face other challenges such as restarting production lines and addressing issues related to obsolete parts and materials. Further, satellites on orbit can be made to last longer by turning power off

at certain points in time, but this may also present unacceptable trade-offs in capability.

UNDERLYING REASONS FOR COST AND SCHEDULE GROWTH

Our past work has identified a number of causes behind the cost growth and related problems, but several consistently stand out. First, on a broad scale, DOD starts more weapon programs than it can afford, creating a competition for funding that encourages low cost estimating, optimistic scheduling, overpromising, suppressing bad news, and, for space programs, forsaking the opportunity to identify and assess potentially more executable alternatives. Programs focus on advocacy at the expense of realism and sound management. Invariably, with too many programs in its portfolio, DOD is forced to continually shift funds to and from programs—particularly as programs experience problems that require additional time and money to address. Such shifts, in turn, have had costly, reverberating effects.

Second, DOD has tended to start its space programs too early, that is, before it has the assurance that the capabilities it is pursuing can be achieved within available resources and time constraints. This tendency is caused largely by the funding process, since acquisition programs attract more dollars than efforts concentrating solely on proving technologies. Nevertheless, when DOD chooses to extend technology invention into acquisition, programs experience technical problems that require large amounts of time and money to fix. Moreover, when this approach is followed, cost estimators are not well positioned to develop accurate cost estimates because there are too many unknowns. Put more simply, there is no way to accurately estimate how long it would take to design, develop, and build a satellite system when critical technologies planned for that system are still in relatively early stages of discovery and invention.

While our work has consistently found that maturing technologies before a program's start is a critical enabler of success, it is important to keep in mind that this is not the only solution. Both the TSAT and the Space Radar development efforts, for example, were seeking to mature critical technologies before program start, but they faced other risks related to the systems' complexity, affordability, and other development challenges. Ultimately, Space Radar was cancelled, and DOD has proposed the cancellation of TSAT. Last year, we cited the MUOS program's attempts to mature critical technologies before the program's start as a best practice, but the program has since encountered technical problems related to design issues and test anomalies.

Third, programs have historically attempted to satisfy all requirements in a single step, regardless of the design challenge or the maturity of the technologies necessary to achieve the full capability. DOD has preferred to make fewer but heavier, larger, and more complex satellites that perform a multitude of missions rather than larger constellations of smaller, less complex satellites that gradually increase in sophistication. This has stretched technology challenges beyond current capabilities in some cases and vastly increased the complexities related to software. Programs also seek to maximize capability because it is expensive to launch satellites. A launch using a medium- or intermediate-lift EELV, for example, would cost roughly $65 million.

Fourth, several of today's high-risk space programs began in the late 1990s, when DOD structured contracts in a way that reduced government oversight and shifted key decisionmaking responsibility onto contractors. This approach—known as Total System Performance Responsibility (TSPR)—was intended to facilitate acquisition reform and enable DOD to streamline its acquisition process and leverage innovation and management expertise from the private sector. Specifically, TSPR gave a contractor total responsibility for the integration of an entire weapon system and for meeting DOD's requirements. However, because this reform made the contractor responsible for day-to-day program management, DOD did not require formal deliverable documents—such as earned value management reports—to assess the status and performance of the contractor. The resulting erosion of DOD's capability to lead and manage the space acquisition process magnified problems related to requirements creep and poor contractor performance. Further, the reduction in government oversight and involvement led to major reductions in various government capabilities, including cost-estimating and systems-engineering staff. The loss of cost-estimating and systems-engineering staff in turn led to a lack of technical data needed to develop sound cost estimates.

ACTIONS NEEDED TO ADDRESS SPACE AND WEAPON ACQUISITION PROBLEMS

Over the past decade, we have identified best practices that DOD space programs can benefit from. DOD has taken a number of actions to address the problems on

which we have reported. These include initiatives at the department level that will affect its major weapons programs, as well as changes in course within specific Air Force programs. Although these actions are a step in the right direction, additional leadership and support are still needed to ensure that reforms that DOD has begun will take hold.

Our work—which is largely based on best practices in the commercial sector—has recommended numerous actions that can be taken to address the problems we identified. Generally, we have recommended that DOD separate technology discovery from acquisition, follow an incremental path toward meeting user needs, match resources and requirements at program's start, and use quantifiable data and demonstrable knowledge to make decisions to move to next phases. We have also identified practices related to cost estimating, program manager tenure, quality assurance, technology transition, and an array of other aspects of acquisition-program management that could benefit space programs. Table 1 highlights these practices.

Table 1: Actions Needed to Address Space and Weapon Acquisition Problems

Before undertaking new programs
• Prioritize investments so that projects can be fully funded and it is clear where projects stand in relation to the overall portfolio.
• Follow an evolutionary path toward meeting mission needs rather than attempting to satisfy all needs in a single step.
• Match requirements to resources—that is, time, money, technology, and people—before undertaking a new development effort.
• Research and define requirements before programs are started and limit changes after they are started.
• Ensure that cost estimates are complete, accurate, and updated regularly.
• Commit to fully fund projects before they begin.
• Ensure that critical technologies are proven to work as intended before programs are started.
• Assign more ambitious technology development efforts to research departments until they are ready to be added to future generations (increments) of a product.
• Use systems engineering to close gaps between resources and requirements before launching the development process.
During program development
• Use quantifiable data and demonstrable knowledge to make go/no-go decisions, covering critical facets of the program such as cost, schedule, technology readiness, design readiness, production readiness, and relationships with suppliers.
• Do not allow development to proceed until certain thresholds are met—for example, a high proportion of engineering drawings completed or production processes under statistical control.
• Empower program managers to make decisions on the direction of the program and to resolve problems and implement solutions.
• Hold program managers accountable for their choices.
• Require program managers to stay with a project to its end.
• Hold suppliers accountable to deliver high-quality parts for their products through such activities as regular supplier audits and performance evaluations of quality and delivery, among other things.
• Encourage program managers to share bad news, and encourage collaboration and communication.

Source: GAO.

DOD is attempting to implement some of these practices for its major weapon programs. For example, as part of its strategy for enhancing the roles of program managers in major weapon system acquisitions, the department has established a policy that requires formal agreements among program managers, their acquisition execu-

tives, and the user community that set forth common program goals. These agreements are intended to be binding and to detail the progress a program is expected to make during the year and the resources the program will be provided to reach these goals. DOD is also requiring program managers to sign tenure agreements so that their tenure will correspond to the next major milestone review closest to 4 years. Over the past few years, DOD has also been testing portfolio management approaches in selected capability areas—command and control, net-centric operations, battlespace awareness, and logistics—to facilitate more strategic choices for resource allocation across programs.

Within the space community, cost estimators from industry and agencies involved in space have been working together to improve the accuracy and quality of their estimates. In addition, on specific programs, actions have been taken to prevent mistakes made in the past. For example, on the GPS IIIA program, the Air Force is using an incremental development approach, where it will gradually meet the needs of its users, use military standards for satellite quality, conduct multiple design reviews, exercise more government oversight and interaction with the contractor and spend more time at the contractor's site, and use an improved risk management process. On the SBIRS program, the Air Force acted to strengthen relationships between the government and the SBIRS contractor team, and to implement more effective software development practices as it sought to address problems related to its flight software system. Correspondingly, DOD's Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics is asking space programs to take specific measures to better hold contractors accountable through linking award and incentive fees to program milestones. DOD interim space guidance also asks space programs to make independent technology readiness assessments at particular points in the acquisition process and to hold requirements stable.

Furthermore, the Air Force, U.S. Strategic Command, and other key organizations have made progress in implementing the Operationally Responsive Space (ORS) initiative. This initiative encompasses several separate endeavors with a goal to provide short-term tactical capabilities as well as identifying and implementing long-term technology and design solutions to reduce the cost and time of developing and delivering simpler satellites in greater numbers. ORS provides DOD with an opportunity to work outside the typical acquisition channels to more quickly and less expensively deliver these capabilities. In 2008, we found that DOD has made progress in putting a program management structure in place for ORS as well as executing ORS-related research and development efforts, which include development of low cost small satellites, common design techniques, and common interfaces.

Legislation introduced in recent years has also focused on improving space and weapon acquisitions. In March, the Senate Committee on Armed Services introduced an acquisition reform bill which contains provisions that could significantly improve DOD's management of space programs. For instance, the bill focuses on various measures, including increasing emphasis on systems engineering and developmental testing, instituting earlier preliminary design reviews and strengthening independent cost estimates and technology readiness assessments. Taken together, these measures could instill more discipline in the front end of the acquisition process when it is critical for programs to gain knowledge. The bill also requires greater involvement by the combatant commands in determining requirements and requiring greater consultation among the requirements, budget, and acquisition processes. In addition, several of the bill's sections, as currently drafted, would require in law what DOD policy already encourages, but it is not being implemented consistently in weapon programs. In April, the House Committee on Armed Services introduced a bill to similarly reform DOD's system for acquiring weapons by providing for, among other things, oversight early in product development and for appointment of independent officials to review acquisition programs. Both bills are moving forward in the Senate and House.

The actions that the Air Force and Office of the Secretary of Defense have been taking to address acquisition problems are good steps. However, there are still more significant changes to processes, policies, and support needed to ensure reforms can take hold. With requirements, resource allocation, and acquisition processes led by different organizations, it is difficult to hold any one person or organization accountable for saying no to a proposed program or for ensuring that the department's portfolio of programs is balanced. This makes it difficult for DOD to achieve a balanced mix of weapon systems that are affordable and feasible. For example, diffused leadership has been problematic with the GPS program in terms of DOD's ability to synchronize delivery of space, ground, and user assets. GPS has a separate budget, management, oversight, and leadership structures for the space, ground, and user equipment segments. Several recent studies have also concluded that there is a need to strengthen leadership for military and intelligence space efforts. The Allard Com-

mission reported that responsibilities for military space and intelligence programs are scattered across the staffs of the DOD and the Intelligence Community and that it appears that "no one is in charge" of national-security space. The HPSCI expressed similar concerns in its report, focusing specifically on difficulties in bringing together decisions that would involve both the Director of National Intelligence and the Secretary of Defense. Prior studies, including those conducted by the Defense Science Board and the Commission to Assess United States National Security Space Management and Organization (Space Commission)[4] have identified similar problems, both for space as a whole and for specific programs. While these studies have made recommendations for strengthening leadership for space acquisitions, no major changes to the leadership structure have been made in recent years. In fact, an "executive agent" position within the Air Force that was designated in 2001 in response to a Space Commission recommendation to provide leadership has not been filled since the last executive resigned in 2007.

In addition, more actions may be needed to address shortages of personnel in program offices for major space programs. We recently reported that personnel shortages at the EELV program office have occurred, particularly in highly specialized areas, such as avionics and launch vehicle groups. Program officials stated that 7 of 12 positions in the engineering branch for the Atlas group were vacant. These engineers work on issues such as reviewing components responsible for navigation and control of the rocket. Moreover, only half of the government jobs in some key areas were projected to be filled. These and other shortages in the EELV program office heightened concerns about DOD's ability to use a cost-reimbursement contract acquisition strategy for EELV since that strategy requires greater government attention to the contractor's technical, cost, and schedule performance information. In previous reviews, we cited personnel shortages at program offices for TSAT as well as for cost estimators across space. While increased reliance on contractor employees has helped to address workforce shortages, it could ultimately create gaps in areas of expertise that could limit the government's ability to conduct oversight.

Further, while actions are being undertaken to make more realistic cost estimates, programs are still producing schedule estimates that are optimistic while promising that they will not miss their schedule goals. The GPS IIIA program, for example, is asking the contractor to develop a larger satellite bus to accommodate the future GPS increments and to increase the power of a new military signal by a factor of 10, but the schedule is 3 years shorter than the one achieved so far on GPS IIF. We recognize that the GPS IIIA program has built a more solid foundation for success than the IIF program. This foundation offers the best course to deliver on time, but meeting an ambitious schedule goal should not be the Air Force's only measure for mitigating potential capability gaps. Last year, we also reported that the SBIRS program's revised schedule estimates for addressing software problems appeared too optimistic. For example, software experts, independent reviewers, as well as the government officials we interviewed agreed that the schedule was aggressive, and the Defense Contract Management Agency has repeatedly highlighted the schedule as high risk.

CONCLUDING REMARKS

In conclusion, senior leaders managing DOD's space portfolio are working in a challenging environment. There are pressures to deliver new, transformational capabilities, but problematic older satellite programs continue to cost more than expected, constrain investment dollars, pose risks of capability caps, and thus require more time and attention from senior leaders than well-performing efforts. Moreover, military space is at a critical juncture. There are critical capabilities that are at risk of falling behind their current level of service. To best mitigate these circumstances and put future programs on a better path, DOD needs to focus foremost on sustaining current capabilities and preparing for potential gaps. In addition, there is still a looming question of how military and intelligence space activities should be organized and led. From an acquisition perspective, what is important is that the right decisions are made on individual programs, the right capability is in place to manage them, and there is someone to hold accountable when programs go off track.

Mr. Chairman, this concludes my prepared statement. I would be happy to answer any questions you or members of the subcommittee may have at this time.

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[4] Department of Defense. Report of the Commission to Assess United States National Security Space Management and Organization (Washington, DC: Jan. 11, 2001).

CONTACTS AND ACKNOWLEDGEMENTS

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Senator BILL NELSON. Once Senator Vitter and I get through with our questions, we are going to adjourn to the Office of Senate Security for a discussion on classified matters. So I will start out with just a couple of questions, and then flip it to you, and we will just keep going back and forth.

Ms. Chaplain, GAO recently issued a report about a potential gap in the Global Positioning System (GPS) satellites. Can you explain that gap and what happens in the gap period and the assumptions that you made in determining there is potential for a gap?

Ms. CHAPLAIN. Thank you. We recently reported on the GPS, and the bottom line, in terms of the gap analysis we did, we did an analysis that replicates what the aerospace corporation does, and we even matched up our results with the aerospace corporation. So we have a lot of confidence in the results of our gap analysis.

With regard to the potential gap in satellite capability, our analysis showed that if both the GPS IIF and the GPS IIIA programs are executed on schedule, there is still just an 80 to 90 percent probability that the constellation will stay above 24 satellites, which is the commitment the United States has to provide. If there were a 2-year delay—our analysis in the 2-year delay in the GPS IIIA program, that is—our analysis showed that the probability would drop to as low as 10 percent.

I have a couple parameters on this. I think our analysis has been exaggerated in some of the recent media reports. They are painting a bit more dire picture than we had in our report. There are also measures that can be taken to extend the life of satellites, such as turning off secondary payloads, but they need to be discussed among all the players involved with that action.

Our concerns are with the issue of aging satellites in the constellation, the delays in the IIF program, and whether that schedule can even be achieved as it is now because they still have some technical problems they are working on.

Then on the IIIA program, we were very pleased to see the Air Force has taken a lot of actions to prevent mistakes that were made on the IIF programs, and those actions mirror the things that we all want done for all the space programs, including trying to keep requirements manageable, hold more design reviews, follow military design standards, and things of that nature.

But even with that, the schedule, in our view, will be challenging, given the nature of satellite development, the fact that they want a bigger satellite bus on the IIIA program, they are increasing the signal by a power of 10. It is a lot of challenge for the contractor to meet and there may be not enough room in the schedule to accommodate problems that could come up. So that is where we had a concern on the IIIA program.

Senator BILL NELSON. Mr. Secretary and General, what is your assessment of a probability of a gap, and how can you mitigate it?

Mr. PAYTON. Yes, sir. The GAO concerns are the same concerns that we had initially going back 3 years ago as we were architecting the IIIA program, the GPS III program. That was the first program where the Air Force applied what we call "back-to-basics" in our space acquisition. Back-to-basics includes intense conversations with the warfighters to understand their needs. It includes evolutionary block deliveries of new capabilities and GPS III, for example, has three separate blocks, and each one delivers more capabilities for the warfighter as opposed to trying to leap dramatically to a brand new, almost Battle Star Gallatica kind of a delivery.

So additionally, we have gone through independent cost estimates. We went through 4 years of systems engineering and technology risk reduction in a competitive industrial environment to buy down the risks on the program and to better understand how different designs can satisfy the warfighters' needs. So we have much more confidence in the acquisition of GPS III due to these back-to-basics fundamentals that we are implementing compared to the systemic problems that prior space programs had suffered. So GPS III, IIIA, IIIB, and IIIC is the first and currently still successful implementation of the back-to-basics philosophy in our space acquisition.

To date, it has IIIA. The GPS III design work has been progressing faster than schedule. In fact, today is the first major design review on the IIIA spacecraft, and the program is progressing much faster and with much higher confidence simply because of those 4 years we spent before we settled on a particular industry team and before we settled on a particular spacecraft design.

Senator BILL NELSON. General, do you have anything to add?

General KEHLER. Sir, just a couple of things. First of all, thank you for inviting us today—you and Senator Vitter both. We appreciate the committee's attention and concern on all the space issues. I would just add a couple things to what Secretary Payton has said.

First, the world depends on GPS. We know it. We are responsible for it. We take that responsibility seriously and we are committed to keeping the level of service and actually improving the level of service that the world has come to expect out of us.

The second thing I would point out to you is that today we have the largest, most capable GPS constellation on orbit that we have ever had. There are over 30 satellites on orbit today, and they are performing well. They are not all in the same state of health. Some are older than others. Some have some problems that others that are newer do not have, but it is a large and very robust constellation on orbit today.

That gives us a little bit of breathing space, if you will. We understand where the problems are here. We know and believe that we have worked through the problems on the IIF satellites. We are not disagreeing with GAO over the nature of the problems that have arisen, but we are ready by the end of the summer/early fall to put the first GPS IIF satellite on orbit. We believe, as Mr. Payton said, that GPS III is progressing very well. There are other steps that we can take and will take to work through the gap if this gap arises.

By the way, it is not a gap in terms of coverage. It is a reduction in the global coverage. It is hard to explain, but characterizing it as a gap, I think, is a little bit of a mischaracterization.

But having said that, we are not pushing back on where the issues have been. We do think that we have measures in place to work our way through this time period. We are looking forward to GPS III because we have brought forth the very acquisition improvements that have been suggested to us into that program and believe that will be very helpful for us.

I think as we look at this today and we look at IIF now getting ready to launch, III going through its acquisition cycle, and us having committed the right people, the right funding, the right cost estimates, et cetera, sir, as you had mentioned earlier on, the fact that we have new signals entering into the constellation, the fact that we have some ways to manage power and other things, we think that we can manage our way through this.

Senator BILL NELSON. Senator Vitter?

Senator VITTER. Thank you.

Just to follow up directly on that, Mr. Secretary, in general, what would be your bottom line on this in terms of, what do you think the probability is of any sort of gap, however broadly defined developing? Is there, in fact, a backup plan besides just the roll-out of what you have scheduled? If that slows, if that fails to continue to meet targets, what is the backup plan to mitigate or avoid any so-called gap?

Mr. PAYTON. Senator, I would suggest we push that question to General James because he is the operator of the constellation, the warfighter that delivers that GPS capability, and he has those sorts of operational mitigations that you referred to.

General JAMES. Yes, sir. Just to address that, there are several things that we look at. First of all, we manage the constellation in totality, as General Kehler said, 30 satellites. If we start to lose satellites before we can launch replacements, we can adjust those orbits to ensure that we provide the best possible coverage for GPS. The fundamental requirement is 24 satellites. So we will continue to manage that constellation to make sure that we adjust orbits to improve and provide the best possible GPS capability we can.

In addition, we actually have——

Senator VITTER. I do not mean to interrupt. But the best capable. What is the possibility of falling short of what is our expectation and defining a gap as anything short of that?

General JAMES. Sir, again, the fundamental requirement is 24 satellites. We are at 30 now. Plus, we have three on-orbit spares that we can actually bring back into the mix. So again, just an opinion that the probability is relatively low that you would see major problems with a GPS signal worldwide. There could be areas where, for example, over the poles or northern latitudes that you have less accurate coverage, but still within requirements, et cetera. So again, it is a very dynamic position, as the satellites move around in the sky, in terms of the coverage you get and what you would see. But you would really have to drop from 33 today, 30 plus 3 on-orbit spares that we have, down to that 24, which is the very basic requirement that we are required to meet and provide from the United States.

Senator VITTER. Gentlemen, any of you can respond. What are your general thoughts regarding this IDA report and the specific conclusion that we suffer from no one really being in charge in a global sense with regard to space? Do you think there is some fairness in that? What should be done about it? How can we bring more focus in terms of developing an overall space road map and investment plan?

Mr. PAYTON. I would say, Senator, when we say no one is in charge, that is a misnomer. I would say the warfighter is in charge. Those of us on the acquisition side turn to the warfighter to determine what capabilities we deliver, at what pace we deliver those capabilities, and at what price. Again, part of our back-to-basics is a very tight integration of warfighter conversations with the acquisition community so that we do satisfy those needs that they advertise.

Senator VITTER. Let me ask it a little differently. Warfighter is a lot of different people, and we salute them and we certainly want to service them. Who is in charge of integrating all of that input and those needs into a clear, unified road map?

Mr. PAYTON. Since space is global inherently, we turn to Strategic Command for that.

Senator VITTER. Do you think they are effective in truly integrating that into an overall road map and investment plan?

Mr. PAYTON. Yes, sir.

Senator VITTER. Where is that sort of overall road map laid out and defined?

Mr. PAYTON. Through the normal Pentagon planning processes. Strategic Command quantifies their priorities, representing the theater combatant commanders. They quantify their priorities and the pace that they need those priorities filled, and whether it is Air Force or Navy or even the National Reconnaissance Office, we marry our deliveries to those warfighter needs.

General KEHLER. Sir, if I could add a little bit to that as well. Again, on the DOD side of this equation, Strategic Command, as a combatant command, sits in a very critical place in terms of space operational capabilities. That is where the requirements originate, and when the warfighting requirements for space-related things originate, there is a process that ultimately hands those requirements, once they're validated, in large part—not exclusively, but in large part—to the Air Force. When they come to the Air Force, then the Air Force Space Command, my command, is responsible for taking those requirements and turning them into actual capabilities.

On the operational side, a very similar thing happens. Strategic Command is responsible for the day-in and day-out operations of our space assets as well, our DOD space assets. General James is the commander day-in and day-out that exercises that operational responsibility, the operational control, if you will, over those assets.

So there are two chains here. In terms of the warfighters and warfighting requirements, we think this works pretty well. This is something we have arrived at after a great deal of effort to get us into this particular position where warfighting requirements follow the standard chain that other warfighting requirements follow, and space operations follow a standard set of activities that actually

puts the capability in the hands of the people who are forward who need it.

So we are pretty comfortable that, as we sit here today, we understand how requirements turn into programs that turn into capabilities and who is responsible for that. We are also pretty comfortable today that the operational use of these platforms and how we make that available to the warfighters is also pretty well understood.

General JAMES. Sir, if I could just expand quickly. Again, under the Joint Forces Component Commander, then we have responsibility for Army, Navy, and Air Force space forces. We also reach out to the combatant commanders around the globe. We receive inputs from them on a daily basis in terms of what are the requirements for current operations today, and we build all that into a tasking order and provide those capabilities on a regular basis. So we are, indeed, integrating those space capabilities across all the Services, provide that combatant commander with what he needs on a regular basis.

General KEHLER. I would add one final point, sir, if I may. The IDA reports and other reports have really not just looked inside the DOD, but they have looked across the interagency where they have raised some of their concerns. You have a defense activity. You have an intelligence activity. You have other activities. The question that they have raised is how do those interact, and those are questions that, among other things, will be looked at in the space posture review.

Senator VITTER. The final question for now. I would love thoughts from any of you, including the GAO, about the suggestion by some that we do not have enough focus—it is not all or nothing—but enough focus on small satellites, things that are more focused, simpler, much cheaper, and we focus too much on mega, extremely complex systems, and that we could get some benefit in certain areas from focusing on smaller, simpler things, including spurring more entrants in the field and more competition because not everyone is going to get in the business of building the mega, most complicated satellites. Do you have reactions to that very broad suggestion?

Mr. PAYTON. It is a very timely topic, Senator. Last night we launched out of Wallops Island a spacecraft called Tactical Satellite (TACSAT)–3, a small satellite launched off of a Minotaur to low-earth orbit. It was a project run by Air Force Research Lab but with participation from Navy Research Lab, and it was part of our operational responsive space program. Again, a technology demonstration, but demonstrating that we can field and deploy a spacecraft for a particular theater combatant commander's needs.

So that demonstration, again launched last night, will have about a year of on-orbit operation to demonstrate some new technologies, but mostly how to operate more efficiently with an on-orbit asset. So, again, that is one example of small satellites through the operational responsive space program, how small satellites can benefit military combatant commanders.

General KEHLER. Sir, we would agree. We see that there is great potential in smaller platforms that do single-purpose kinds of things that can be put up faster and at lower cost. The warfighters

have said that there are requirements for platforms like that. The Commander of Strategic Command has told us that he is interested in being able to augment or reconstitute pieces of the constellations that the warfighters depend on.

As Mr. Payton said, this is a next step that we just took last evening on this road. We are very encouraged by what we are seeing so far. We would like it to go faster, and we are trying to work on that in terms of investment, but we see the great potential in being able to put another strategic arrow in our quiver with smaller satellites. In some cases, we may be able to do a substantial amount of some of these missions. In some cases, we are going to have to have larger platforms.

General JAMES. Sir, just from an operational perspective, we are preparing, once they are done with the experimental phase of these, to actually take them over operationally and build the concepts, tactics, techniques, and procedures to actually provide that data right into the theater and develop those procedures where we accept requests from the theater and use these operationally as well as experimentally. So we are all on board with moving forward in that arena.

Admiral HARRIS. Sir, from the Navy's perspective, we are a strong believer in the Operationally Responsive Space (ORS) concept. Our Navy Research Lab, in conjunction with the Office of Naval Research and the Air Force Research Laboratory and various applied physics labs across the country—we partner with them to participate in the ORS program. We think it is great for the country. It is great for industry, and it gives the warfighter the potential for on-call services down range. So we are committed to it, and we happily participate in it.

Ms. CHAPLAIN. We have been generally supportive of the ORS program, not just because of the focus on small satellites, but because it also provides the potential to standardize design techniques and to also lower the costs of launch, which is very important to reducing acquisition costs overall, and also of the potential of the program to bring in new players into the space business.

Also, just by virtue of working on smaller programs that go faster, you are providing a lot of learning opportunities for people that do not have those opportunities on these longer kinds of efforts. It encourages just more learning and risk-taking in general.

You have to be cautious in applying this concept across all of space because some of the requirements are very demanding and the solutions inherently have to be different at this point in time.

Senator VITTER. Thank you.

Thank you, Mr. Chairman.

Senator BILL NELSON. Senator Sessions.

Senator SESSIONS. Thank you. Thank you, Mr. Chairman. It is good to be back with you, and I am glad that my colleague, Senator Vitter, is your ranking member. I am sure you can get a lot more productive work out of him than you were able to get out of me. He is committed to our country's defense and has the brain power to understand the complexities that we deal with. [Laughter.]

General Kehler, you point out in your testimony that Air Force Command provides land-based strategic deterrence through the intercontinental ballistic missile (ICBM) fleet. Could you outline for

us, briefly, how you maintain the reliability of this force over time and what are the challenges in what you do?

General KEHLER. Sir, first of all, we are about to complete a very substantial investment in the Minuteman ICBM force that will take it to 2020. We are looking at what it might take in additional investment to take it to 2030.

Now, how do we do that? We do that through a variety of programs that sustain this force and analyze the force and where it may need investment and then take those investment steps. One of the key activities that we have is an aging and surveillance program. That aging and surveillance program looks very hard at the boosters themselves and the supporting equipment that goes with those to try to predict where failures might occur in the future.

For example, three times a year—and we are looking at going to a fourth, but for right now three times a year—we operationally test fly a full-up Minuteman round, if you will, from one of the operational bases where it is disassembled, taken to Vandenberg Air Force Base, reassembled, shot down the western range. We also fire static test assets at various locations around the country. We also dissect some of these missiles. We do analysis on the chemical content of the fuels, and we constantly look at the electronics. The system, as it sits there deployed operationally in the field every day, is constantly going through a set of self-checks and self-analysis to tell us what its health is.

Senator SESSIONS. I think you are to be commended for that. I think that has been an important part of the confidence we have in that system.

So you are doing as many as three flights a year?

General KEHLER. Yes, sir.

Senator SESSIONS. I remember we cut the ICBM force from 500 to 450. Part of the agreement to do that was that we needed those launches for testing. I believe that is right.

General KEHLER. Yes, sir.

Senator SESSIONS. So, Mr. Chairman, I do not know if we have lined up enough in our Ground-based Midcourse Defense program for testing. You have always felt we probably should have more rigorous testing, and then if we are going to keep this system in place for a while, we will need to make sure we have enough when we look at that number on testing.

Senator BILL NELSON. We are going to bring General O'Reilly in here.

Senator SESSIONS. Okay, very good.

ORS is something I know that the chairman has been interested in and supportive of. You announced, Secretary Payton, a launch yesterday?

Mr. PAYTON. Yes, sir. Last night.

Senator SESSIONS. So far, so good?

Mr. PAYTON. Yes, sir. It was a successful routine launch out of Wallops Island. The satellite separated from the last stage of the Minotaur launch vehicle. Solar rays unfurled, and they are going through on-orbit checkout right now.

Senator SESSIONS. Just briefly, how do you feel about how the progress is going on this? I think you said that earlier, but would

you summarize that for me what your best judgment is? Are we on schedule?

Mr. PAYTON. Yes, sir. In addition to the TACSAT operational experiments, we have another program that is responding to an urgent need from Central Command, a project we call ORS satellite number 1, not very descriptive. It is intended to respond to an urgent need from Central Command. So we have selected an industry team to go out and build the spacecraft with very mature technology, piece part technology designs. Part of that is to even use the existing link from space to the ground, use the existing link that the U2 uses today, so that when this satellite flies over Central Command, they will be able to receive it as if it is a very high altitude U2. It fits right into their analytical work stations for Central Command. So it is a very fast-paced program that the ORS program is managing.

Senator SESSIONS. Space News reported May 18 that the 2010 funding request is insufficient to launch the ORS 1 satellite mission planned for 2010. Is that a disappointment? How did we let that slip?

Mr. PAYTON. No, sir. We have a decision point in the program, again, part of our back-to-basics. If the program is still making good progress on its design evolution and its subcontracting and delivery of the piece parts for the spacecraft and the sensors, if that is going well in early July, we will make a conscious decision about how fast to continue that program. So the budget requests necessary to keep that program on a fast pace are in the process to come to Congress for approval.

Senator SESSIONS. So you have an urgent request. The original plan, as I understood it, was to do it by 2010, but our warfighter now is not going to have it.

Mr. PAYTON. No, sir. Again, we do not want to spend money to keep a program on a pace that technically it will not deliver. So the decision point this summer is what pace to deliver that spacecraft on.

Senator SESSIONS. It is not a question of money but a technological capability?

Mr. PAYTON. It is a question of can the industry prove that they can deliver on that 2010 pace.

Senator SESSIONS. If they can, you will have the money to fund it?

Mr. PAYTON. Yes, sir. If not, our plan is to continue the program, but not on the rapid pace.

Senator SESSIONS. Thank you, Mr. Chairman.

Senator BILL NELSON. General Kehler, you were mentioning other agencies. Of course, DOD has an imminent interest in knowing what the weather is. We have not had too good of an experience with a National Polar-Orbiting Operational Environmental Sensing Satellite (NPOESS). General James, how important is it that these sensors get fielded?

General JAMES. Sir, from the warfighting perspective, weather it is absolutely essential and maintaining our awareness of the weather in theater and out is extremely critical to planning and conducting operations. So it is certainly critical.

Looking to the ground weather perspective, there are many weather satellites that we rely on, of course, the current Defense Meteorological Satellite Program (DMSP) constellation, which we will have three satellites to be launched. So that will carry us forward for some period of time. Then other National Aeronautics and Space Administration (NASA) and civil weather satellites that we can utilize for weather forecasting. But it is absolutely critical to military operations and also space operations because there is space weather that our space satellites conduct and determine and monitor solar wind, solar flux, those sorts of things that are important for satellite operations that we also need to maintain the capabilities for from the warfighter and operational perspective.

Senator BILL NELSON. The structure on NPOESS between the Air Force and National Oceanic and Atmospheric Administration (NOAA) and NASA has not worked. There is a committee or a task force report that is coming out in a week or so headed by a very respected person in these matters, Tom Young. That report is going to say that basically, since it is underfunded, it needs to be funded, but that between the DOD and NOAA and NASA, they have to get their act together. The recommendation is going to be that basically NASA design and operate the satellite for NOAA with the cooperation of DOD. Do you have any problem with that?

General JAMES. Sir, I will just speak from the warfighter perspective. The warfighter has weather requirements. As long as the acquisition process meets those requirements, then no. But I would turn to the acquisition side to talk about the management of the program itself, but the requirements will still be the requirements and they need to be addressed in whatever form or program management structure exists.

Senator BILL NELSON. Okay. Mr. Secretary and General Kehler?

Mr. PAYTON. I would suggest that today NOAA operates not only the polar-orbiting satellite that they have sponsored, but also the DMSP military spacecraft. So from a shared operational perspective of constellation management and flying the spacecraft and tasking the spacecraft, NOAA does that for both the Air Force and the rest of the world right now. We rely on European sensors also from their program they have called MEDOP. So the operational relationship is already established.

The difficulty with NPOESS has been a very complex and sophisticated suite of sensors that have been troublesome in their development, in their engineering, most notably a sensor called visible and infrared sensor. That is the shared difficulty that NASA and NOAA and the Air Force have right now, and the delivery and development of that sensor has been the cause of our frustrations with the NPOESS program.

Senator BILL NELSON. I would suggest to you that another problem is its management by committee, and you have to have a lead. The Tom Young report is going to suggest that NASA be the lead.

Mr. PAYTON. If we do march down that path, we will have to have very strong confidence and guarantees from NASA that they could satisfy the warfighters' requirements. We would have to work out mechanisms to ensure that.

Senator BILL NELSON. Where does Ash Carter play into this?

Mr. PAYTON. Senator, I honestly do not know. He would be a critical decision-maker if we moved down that path.

Senator BILL NELSON. What I would like you to do is maybe we will get him and you back up here after you have looked at this Tom Young report. But this thing is going to take another billion, billion and a half dollars, to complete. I think the management structure has in large part been the problem, as well as the technical challenges. So we will visit that one on another day.

Mr. PAYTON. Yes, sir.

Senator BILL NELSON. In the meantime, I think it would be well if you would get with Ash Carter and you all get Dr. Young's report and see what conclusions and reach out to NOAA and to NASA.

Mr. PAYTON. Yes, sir. His organization is already working with us to scrutinize to date his suggestions and to look at alternative implementations.

Senator BILL NELSON. Let us talk about protected communications. It appears there may be a gap in 2018. What is the likely potential for this gap? General Kehler and Mr. Secretary?

General KEHLER. Sir, protected communications remains a critical warfighting requirement. That has not changed here recently, although some of the budget decisions with the fiscal year 2010 budget have adjusted the demand date for increased protected communications. Some of it was tied to the Army's future combat system and some other Service programs that have now been altered with other budget decisions.

Nevertheless, the requirement for protected communications for the forward forces remains an especially growing requirement for communications on the move that are protected. We have two programs underway right now. One is not protected. That is the Wideband Global Satellite (WGS) system. We have put two of those satellites on orbit. The first one was turned over to Pacific Command almost a year ago and is functioning very well. The second one is on orbit and going through its checkout phase, and all indications are that that one will be very successful. We have four more of those to launch in the coming several years to put much more unprotected capability on orbit, which is important for the warfighters as well.

Protected communications today is the Military Strategic and Tactical Relay satellite. That is the name of the satellite that does that. We are going to replace that with the Advanced Extremely High Frequency (AEHF) satellite. We expect to launch the first of the AEHF satellites within the next year or so, perhaps a little bit longer, the fall probably of 2010, and that will be the first of four AEHF satellites. Now with the budget decisions on TSAT, which was to be the follow-on, we are looking very hard at an architecture that will continue to put upgraded, if you will, AEHFs into the system beyond number 4.

So sitting here today, I am not concerned about a gap, as we would think of no satellites on orbit. The question is how quickly can we bring additional capability into AEHF as the warfighters' need goes up. I think we have a way forward to do that. I think it was Mr. Payton who used a great word a week or so ago in another appearance where he talked about "harvesting" the technology out of the TSAT program. We will need to go do that, find

out how quickly we can infuse some of that technology, both in WGS and in AEHF, and continue to rely on commercial as well and approach this in the sense of an architecture.

So I am not overly concerned, sitting here today, about a gap, if you will, in 2018 or 2019. I think the challenge for us is to decide how do we go forward here with advanced EHF and what does that mean in terms of being able to pull new things into advanced EHF. Those decisions have to be made and brought back probably in the next budget, not this one.

Senator BILL NELSON. Ms. Chaplain, do you think there is a gap?

Ms. CHAPLAIN. We have not done a formal gap analysis on this issue and would like to, but we are concerned about the potential gap in protected communications, as well as the ultra high frequency (UHF) communications, as well as missile warning capabilities, and of course, the GPS and the weather satellites.

AEHF is still not out of the woods yet either in terms of technical problems, it is important to remember that. While you can add evolutionary over-time capabilities to AEHF, you have to also be aware that at some point you might be adding so much you need, again, a larger satellite bus and more redesign that might take more time than you think to answer.

Senator BILL NELSON. I want to talk about TSAT. It was canceled, but after we spent $2 billion on it. Mr. Secretary, what plans are in place to preserve the work that was done for TSAT?

Mr. PAYTON. Yes, sir. The TSAT program had matured what I call piece part technologies to a very high technical readiness level. These are irradiation hardened processors, laser com, a multitude of technologies that the GAO identified several years ago and the Air Force agreed with, and we spent over $2 billion maturing those technologies before we would set the configuration of the spacecraft itself and before we would select a single particular industry to go build the spacecraft.

Those are the technologies that I used the term "harvest" from the TSAT program so that we collect the intellectual property that the government has rights to, we collect the equipment that the government justly, rightfully owns, and we start laying in the plans and the designs on how to apply those harvested technologies to both AEHF and WGS.

So that is in front of us over the next months, and again, we will turn to the warfighter to prioritize which new capabilities we add when out of that harvested collection of intellectual property and piece part technologies from the TSAT program.

Senator BILL NELSON. Is AEHF next?

Mr. PAYTON. Yes, sir. The first launch is a little bit more than a year from now. The fiscal year 2010 budget request includes money for the fourth AEHF, and again, our intention is to look at continuing that constellation with the properly phased upgrades to satisfy the warfighter needs.

Senator BILL NELSON. General Kehler, what are the lessons learned from the cancellation of TSAT?

General KEHLER. Sir, that is a really good question. We had begun the TSAT program, I think, doing a lot of things right. We were insisting on technology readiness that was high. We were dedicated to locking down requirements, et cetera. We thought that

if TSAT had continued, that we had started the program correctly and that we had addressed many of the concerns that GAO and others have raised about programs like this.

I think the lesson learned is this is, in part, an issue, I believe, about synchronizing capability with need over the longer term. We were producing TSAT on a schedule that was going to have it ready to provide increased support for warfighting systems that are now perhaps taking a little bit different direction. So I think it is about synchronizing need.

At some point, I think Ms. Chaplain is also correct here in that you can only add to advanced EHF to a certain point, and from there on, we will have to look at a follow-on system to advanced EHF. So we will see where this will have to go in the future, but certainly for the near term, continuing with advanced EHF through number 4 or perhaps beyond that, as we look at the next budgets, will be the right thing to do.

Senator BILL NELSON. Admiral, do you have heartburn as a result of TSAT being canceled?

Admiral HARRIS. No, sir, we do not have heartburn that TSAT was canceled as long as AEHF proceeds on the course that Secretary Payton and General Kehler have outlined. Protected communication, obviously, is important to the Navy, as it is to all the Services; and we are confident, sir, that the Air Force will manage AEHF through to fruition.

Senator BILL NELSON. Do you have heartburn that the Mobile User Objective System (MUOS) is 11 months late?

Admiral HARRIS. Yes, sir, we do have heartburn with MUOS. The Air Force does not have a monopoly on delayed satellite systems. MUOS is suffering an 11-month delay right now. I believe that we will get through it. There are some technical challenges that the builder is experiencing with the critical path through the antenna di-plexer. After it goes through that, the next phase of MUOS testing will involve the thermal vac where a lot of problems could come up; but right now, the problem is in the antenna piece. It is mating the legacy UHF payload to the new antenna bus, and that is a very significant problem.

The Air Force has offered to help us in that, and we are grateful for that offer of assistance. The Assistant Secretary of the Navy for Research, Development, and Acquisition has determined that he needs to put together a team of national experts to help industry to go through this problem that we are having with MUOS. We recognize the importance of the satellite to the warfighter for the UHF communications, and we are grateful for the assistance that the Air Force has offered in that regard.

Senator BILL NELSON. Is the Air Force going to pay for it for you?

Admiral HARRIS. No, sir. That is our program.

Senator BILL NELSON. How much extra is it going to cost?

Admiral HARRIS. Sir, I do not have that information now; but as soon as I get it, I will get that back to you as soon as we know what it is.

[The information referred to follows:]

There is no additional Mobile User Objective System (MUOS) funding required in fiscal year 2010. The MUOS Program Manager is currently projecting Satellite #1

On-Orbit Capability in 2011. Satellite subsystem testing has uncovered technical problems that are being addressed by the prime contractor; not surprisingly, this is causing delivery date slippage. The Assistant Secretary of the Navy for Research, Development, and Acquisition (ASN RD&A) has chartered a national team of space experts to assess the program and provide recommendations to reduce schedule and technical risks. Following the team's report, ASN RD&A will work with OPNAV N6 on a budget to meet MUOS requirements in support of PRESBUD 11. Since this assessment is ongoing the budget figures are not yet ready. Therefore, this is an interim response. Once the new cost is fully understood, I will forward the difference for fiscal year 2011 to you.

Senator BILL NELSON. Okay. We need to know that.

Admiral HARRIS. Yes, sir.

Senator BILL NELSON. The legacy UHF satellite is not lasting as long as it was supposed to. So now there appears to be the possibility of a UHF gap. Tell us about that.

Admiral HARRIS. Yes, sir. Sir, if MUOS suffers this 11-month delay, the first on-orbit capability will be in February 2011. The projected 70 percent line from which we would call a gap will happen in mid-2010.

There is a bit of good news here and that is that we are using the legacy satellites and our fleet satellites. Every day that those satellites do not fall out of the sky or fail, that extends that gap point further to the right. I think it is a tribute to good satellite design and acquisition practices that those satellites, as old as they are, continue to remain in orbit and are continuing to produce for us.

The Navy has also put in place several mitigation procedures, including using the digital part of UFO F11 in order to increase channel accesses. So that is good news.

We are optimistic that we will be able to manage through this, and if there is a gap, below 70 percent, that will be minimized, sir.

Senator BILL NELSON. Have you thought about putting a UHF transponder on a commercial satellite?

Admiral HARRIS. Yes, sir, we have. What we have determined is that the cost of doing that and the availability of a satellite to do that in terms of time—the earliest we could put one up would be in the 2012 timeframe, which is after the first MUOS should be on orbit.

Senator BILL NELSON. Are there other contractors involved besides Boeing?

Admiral HARRIS. For MUOS, the prime is Lockheed Martin. What we are trying to do with MUOS, sir, is put the legacy UFO, UHF payload onto the MUOS satellite, on the antenna bus. So the industry is trying to mate a Boeing legacy payload to a Lockheed Martin antenna bus, and that is where the first challenge, the critical path challenge, that we are facing is.

Senator BILL NELSON. We are going to go in just a minute over to the Office of Senate Security.

General James, we had an Iridium satellite collide with a Russian satellite. Joint Space Operations Center has the job to track and to warn of collisions. DOD submitted to us a legislative proposal that would enlarge and expand the program to assist commercial entities with additional support. Will this expanded program result in additional information being provided to the Joint Space Operations Center?

General JAMES. Sir, the commercial and foreign entity program is that to which you refer, and that is a program for us to provide data to various users who sign agreements, and that data would be the location of your satellite, the possible conjunction of your satellite with another object, and then anomaly supports if you have a problem with your spacecraft.

The potential for data coming into the Joint Space Operations Center would be that, as a part of those agreements, we would look to possibly share data from the commercial providers of the world such as INTELSAT, INMARSAT, and SES Americom, where they have very accurate knowledge of their satellite location and they could then provide that into the Joint Space Operations Center freeing up our sensors to go look at other satellites from which we do not have very accurate information. So from an information-sharing perspective, we are looking at some agreements that we would like to foster with the commercial entities to gather some of that location information on their satellites.

Senator BILL NELSON. Would the Air Force get reimbursed for the services you provide to nongovernmental entities in that Joint Space Operations Center?

General JAMES. Sir, the law allows that. At this point, the Department has not elected to charge for those services. I believe that will be a policy decision that needs to be made at the Office of the Secretary of Defense and above on how we implement that.

Senator BILL NELSON. In that operation center, do you not need upgrades?

General JAMES. Yes, sir. As we look at expanding our conjunction assessment capability, we are looking at additional processing capability requirements, as well as additional analyst capability requirements in order to meet some of those needs.

Senator BILL NELSON. In order to avoid these collisions, do you think anything else needs to be done?

General JAMES. Sir, where we are today is that we are bringing on that additional processing capacity here in the near term. We are adding, through funding provided by Air Force Space Command, additional analyst capability, and we are planning to be able to do this conjunction assessment for roughly 800 satellites, those that can maneuver, by this fall. So that is our current plan that we are marching down.

But in the broader sense, we certainly need to increase our capability for space situational awareness, increased sensor capability, increased radar capability, increased on-orbit sensor capability, because we do have shortfalls today in terms of how often we can track objects, how small of an object we can track, and how accurately we can track those objects. So broadly speaking, we need increased space situational awareness capacity.

General KEHLER. Mr. Chairman, may I add just a quick remark to this? Space is more crowded than ever. We catalog over 19,000 objects that are on orbit today. There are most likely thousands more that we do not catalog because of their size, nuts, bolts, washers, that sort of debris, if you will, that is up there, fragments from things that have gone wrong, for example. We know that all of them are traveling at extreme speed, 17,000 miles an hour roughly, and this problem is growing for us.

We have now an investment road map for how we improve our space situational awareness. You will see some of that investment request in this budget that comes to you this year. That includes not only some improvements in sensors, but there is a piece of this investment that will go to General James so he can fuse the data that is out there better. To get better, faster, it is not about putting more sensors out, although we will do some of that. It is about using the sensors we have more effectively. We have plans in place to do that that will be included in this investment plan that you see from us this year.

Senator BILL NELSON. Thank you all for your public service. We are grateful. This is highly technical stuff that we are getting into. We are going to get several layers deeper now. So the subcommittee will stand in recess and we will reconvene over in the Office of Senate Security area. Thank you. We are adjourned.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR MARK UDALL

AIR FORCE SPACE COMMAND

1. Senator UDALL. General Kehler, is there a need for a strategy to rapidly develop and deliver cyber capabilities for the Air Force missions?

General KEHLER. Yes, there is such a need. The cyber domain is characterized by a rate of change that is orders of magnitude faster than the other domains of military operations. The cyberspace threats are constantly changing and require rapid response in order to blunt attacks and secure our ability to fight in air, space, and cyberspace. Every day, Air Force systems are threatened from a variety of sources. It is essential that we have effective capabilities to protect ourselves and respond. Our abilities in this area are limited at this time and enhancements are underway. We are developing a strategy, in conjunction with the acquisition community, to strengthen and improve our capabilities in the burgeoning cyber arena.

2. Senator UDALL. General Kehler, what is Air Force Space Command's plan for rapidly developing and delivering cyber capabilities?

General KEHLER. Our plan is to quickly improve upon the capabilities and processes we currently have and define new ones where needed. We will do this by developing improved processes for rapid decisionmaking, making our capability delivery processes more responsive, better resourcing the real-time response capabilities we already have, and bringing in more cyber smart people and developing them as cyber warriors. We want to fully leverage the finest expertise of U.S. industry, academia, and national laboratories, as well as our sister Services and coalition partners.

Air Force Space Command is taking on the cyber mission for the Air Force, and the ensuing standup of 24AF, will enable development of improved processes for rapid decisionmaking. The dispersed Air Force cyber community will be unified under a single major command, providing efficient command and control of cyber. We must be able to operate faster than our adversaries' decision processes.

We need to strengthen our teaming relationships with key organizations by closely integrating intelligence, operations, requirements, acquisition, and testing. We need to streamline processes to eliminate existing seams in the rapid prototyping development and test environment.

Improved processes are not the total solution. The United States has some of the finest cyberspace minds in the world, and the Air Force has tremendously bright military personnel, civilians, and contractors executing the Air Force missions in cyberspace today. We intend to continue to recruit America's best and brightest, and develop them into technically skilled cyber warriors. We will develop within them the operational arts necessary to ensure mission dominance in the cyber domain. Finally, we will provide them the world-class tools and networks necessary to successfully execute their missions.

[Whereupon, at 3:07 p.m., the subcommittee adjourned.]

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2010

WEDNESDAY, JUNE 3, 2009

U.S. SENATE,
SUBCOMMITTEE ON STRATEGIC FORCES,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

STRATEGIC FORCES PROGRAMS

The subcommittee met, pursuant to notice, at 2:37 p.m. in room SR–232A, Russell Senate Office Building, Senator Bill Nelson (chairman of the subcommittee) presiding.

Committee members present: Senators Bill Nelson, Sessions, and Vitter.

Majority staff member present: Madelyn R. Creedon, counsel.

Minority staff member present: Daniel A. Lerner, professional staff member.

Staff assistants present: Kevin A. Cronin and Breon N. Wells.

Committee members' assistants present: Ryan Ferris, assistant to Senator Bill Nelson; Rob Soofer, assistant to Senator Inhofe; Lenwood Landrum, assistant to Senator Sessions; Matthew R. Rimkunas, assistant to Senator Graham; and Michael T. Wong, assistant to Senator Vitter.

OPENING STATEMENT OF SENATOR BILL NELSON, CHAIRMAN

Senator BILL NELSON. Good afternoon. We're going to welcome Tom D'Agostino, the Administrator of the National Nuclear Security Administration (NNSA), and General Donald Alston, Air Force Chief of Staff for Strategic Deterrence and Nuclear Integration, General Floyd Carpenter, Commander of the 8th Air Force, and Rear Admiral Stephen Johnson, Director of the Navy Strategic Systems Programs. It's a pleasure to have you.

My opening statement will be put in the record, and when Senator Vitter arrives, his will, as well, and we'll ask him if he would like to make any comments.

[The prepared statement of Senator Bill Nelson follows:]

PREPARED STATEMENT BY SENATOR BILL NELSON

We welcome our witnesses this afternoon. Today we have with us Tom D'Agostino, the Administrator of the National Nuclear Security Administration; Major General Donald Alston Assistant Air Force Chief of Staff, Strategic Deterrence and Nuclear Integration; Major General Floyd Carpenter, Commander, 8th Air Force; and Rear

Admiral Stephen Johnson, Director of Navy Strategic Systems Programs. It is a pleasure to have you all here.

I note that this is the last subcommittee hearing prior the markup of the National Defense Authorization Bill for Fiscal Year 2010, which will occur the week of June 22.

We have a number of topics to cover including the actions taken by the Air Force to improve its management of nuclear weapons and the nuclear weapons enterprise; long-range bomber and ballistic missile programs and the programs at the National Nuclear Security Administration. An overarching question and one that in many ways was a root cause of the problems that the Air Force had in the fall of 2007 is the need to maintain rigor in the management of all things nuclear while reducing the role of nuclear weapons in national security strategy. We are no longer in the Cold War but the care with which nuclear weapons are managed and maintained can never be diminished. In many ways a smaller stockpile will be more difficult to maintain and ensure that it remains safe, secure, and reliable.

[The prepared statement of Senator David Vitter follows:]

PREPARED STATEMENT BY SENATOR DAVID VITTER

Thank you very much, Mr. Chairman, I join you in welcoming our witnesses. This is my first hearing as ranking member of the Strategic Forces Subcommittee and I look forward to working with you on the many important issues under this subcommittee's jurisdiction.

The administration's fiscal year 2010 budget provided a significant funding increase for Defense-wide, "white space" programs. This year's request at about $11.1 billion—$9.2 billion of which is for Air Force space programs represents a $412 million increase over fiscal year 2009 appropriated levels. I look forward to hearing from our witnesses today how this money will be spent wisely and what will be done to guarantee that the programs we fund in fiscal year 2010 break away from past practices of cost overruns and long delays.

The Government Accountability Office (GAO), which I am pleased is here today to testify, has for some time highlighted a number of systemic problems associated with our major space acquisition programs. GAO has found that because the Department of Defense (DOD) starts more weapon programs that it can afford—competition for dollars lead to low cost estimation and unrealistic scheduling. GAO notes that DOD tends to start many of its space programs before it has a sound understanding and the appropriate assurance that the technologies it seeks are achievable within available funding. As a result of this broken acquisition process, the Department all too frequently puts itself in a bind with respect to supporting the warfighters needs. Not only are we constantly underestimating cost, but according to GAO, delays in schedule are increasing the overall risk for capability gaps in areas such as positioning, navigation, and timing; missile warning; and weather monitoring.

Under the leadership of Chairman Levin and Ranking Member McCain, this committee broadly recognized those problems in developing the "Weapon Systems Acquisition Reform Act of 2009." That bill emphasizes starting major weapons systems off right by having them obtain reliable and independent cost estimates and subjecting them to rigorous developmental testing and systems engineering early in their acquisition cycle. In so doing, the bill (which will likely be signed into law by the President within the next few days) intends to ensure that programs not proceed from one stage of the acquisition cycle to the next until they have achieved the maturity to clearly lower the risk of cost growth and schedule slippage. I look forward to hearing from our witnesses how they believe the bill will help manage technology and integration risk in DOD military space programs.

I am encouraged by Secretary Gates' recommendation to cancel the Transformational Satellite Communications (TSAT) program, an example of an overly ambitious project, lacking a meaningful technology, schedule, and funding path. I am also pleased to hear that the Department will not let the $3.3 billion already invested in TSAT go to waste. With the recommendation to eliminate TSAT and purchase two additional Advanced Extremely High Frequency (AEHF) satellites, it is clear that the Department recognizes that smaller, more incremental steps forward, are far less risky ventures and are a significantly more responsible path forward with respect to the taxpayer's money. I am encouraged that the Department does not plan to let our hefty investment in TSAT go to waste and does plan to harvest some of TSAT's more successful research and development efforts. I look forward to hearing from our witnesses more about the plan to address our satellite communications needs, how we will utilize TSAT technologies on the procurement of already

proven and technologically mature systems, and how TSAT can be a lesson moving forward for our future space acquisition endeavors.

A recent Institute for Defense Analyses (IDA) report charted by DOD to address congressional concerns with the leadership, management, and organization for National Security Space found that "significant improvements are imperative . . . in order to maintain U.S. space preeminence and advert the loss of the U.S. competitive national security advantage." The report asserts that "no one's in charge," leadership is fragmented with respect to strategy, budgets, requirements, and acquisition and recommends that the President establish and lead the execution of a national space strategy. The report recommends a top-to-bottom overhaul and I look forward to hearing from the witnesses what steps are being taken to address the report's recommendations.

I recognize that space acquisitions are inherently risky and are like no other venture DOD undertakes. The challenges are many and the unknown and need for pushing the technology envelope is great. However, we must do a better job at managing the risk and spending the taxpayers' money wisely. Nonetheless, I look forward to hearing from the witnesses what is being done to address the space acquisition shortcomings, if you believe the condition is getting better, and what more needs to happen within the Department.

Mr. Chairman, thank you.

Senator BILL NELSON. Gentlemen, we will put all of your opening statements in the record, so the record will be complete, and we'll get right into it.

STATEMENT OF HON. THOMAS P. D'AGOSTINO, ADMINISTRATOR, NATIONAL NUCLEAR SECURITY ADMINISTRATION, DEPARTMENT OF ENERGY

[The prepared statement of Mr. D'Agostino follows:]

PREPARED STATEMENT BY THOMAS P. D'AGOSTINO

Thank you for the opportunity to discuss our vision for the National Nuclear Security Administration (NNSA). My remarks today focus on the fiscal year 2010 President's budget request. The budget requested today will allow the NNSA to continue to achieve the mission expected of it by the President, Congress, and the American people.

In a recent trip to Prague, President Obama outlined his vision of a world without nuclear weapons. To this end, the United States will take concrete steps towards achieving such a world by reducing the role of nuclear weapons in our national security strategy and urging others to do the same. Until that ultimate goal is achieved, however, the United States will maintain nuclear forces sufficient to deter any adversary, and guarantee that defense to our allies. To support this vision, the NNSA will continue to:

- Ensure a safe, secure, reliable, and effective nuclear weapons stockpile, even if that stockpile is reduced under a Strategic Arms Reduction Treaty (START) Follow-On Treaty.
- Reduce the threat to the United States posed by the proliferation of nuclear weapons, and related nuclear materials and expertise.
- Provide safe, reliable, militarily-effective propulsion systems to the U.S. Navy.

By pursuing its mission to achieve these ends, and by providing our unique knowledge and support to our partners in national security, the NNSA will continue to meet its current statutory responsibilities while supporting the long-term goal of a world free from the threat of nuclear weapons.

While the President's long-term objectives are clear, the role of the nuclear weapons stockpile and America's deterrence policy are being reviewed as part of the ongoing Nuclear Posture Review (NPR). Efforts are underway in the NPR to establish the size and composition of the future stockpile and the means for managing geopolitical or technical risk—NNSA is fully engaged in these activities. Its role is to provide the technical and scientific input to inform policy decisions, and then to enable the implementation of the decisions.

NNSA is advancing our knowledge of the physical; chemical, and materials processes that govern nuclear weapons operation and is applying that knowledge in extending the life of existing weapons systems. We have recently completed construction of the National Ignition Facility at the Lawrence Livermore National Labora-

tory to explore weapons-critical regimes of high temperature and pressure and will begin our first ignition campaign to improve our scientific understanding of phenomena that could previously only be explored theoretically or in full-scale nuclear testing. The NNSA is also conducting warhead Life Extension Programs to ensure that our country remains secure without the production of new fissile materials, and without conducting underground nuclear tests. On the basis of the most recent assessment by the directors of our national nuclear weapon laboratories, today's nuclear stockpile remains safe, reliable, and secure. At the same time, we are concerned about increasing challenges in maintaining, for the long term, the safety and reliability of the aging, finely-tuned warheads that were produced in the 1970s and 1980s and are well past their original planned service life.

I am committed to continuing to transform our national laboratories and production plants into a smaller and more cost-effective Nuclear Security Enterprise. However, I am mindful that our design laboratories and production facilities are national assets that support a large number of defense, security, and intelligence activities. As the role of nuclear weapons in our Nation's defense evolves and the threats to national security continue to grow, the focus of this enterprise must also change and place its tremendous intellectual capacity and unique facilities in the service of addressing other challenges related to national defense. We are taking steps to move in this direction, including functioning as a national science, technology, and systems engineering resource to other agencies with national security responsibilities.

The NNSA fiscal year 2010 congressional budget request will allow continued progress in obtaining the essential goals I have outlined. It will allow us to:

- Continue transforming into a Nuclear Security Enterprise by:
  - Involving the next generation of our Nation's scientific, engineering, and technical professionals in the broad sweep of technical challenges;
  - Operating the National Ignition Facility, allowing the use of innovative technology to provide answers to important scientific questions;
  - Shrinking the Cold War complex by preparing buildings for decommissioning and decontamination, and replacing these antiquated facilities with modern and efficient facilities; as well as disposing of excess real property through demolition, transfer and the preparation of process-contaminated facilities for transfer to the Department of Energy (DOE) Office of Environmental Management (EM) for final disposition ;
  - Initiating a Site Stewardship program to ensure that NNSA increases the use of renewable and efficient energy, and reduces the number of locations with security Category I/II Special Nuclear Materials, including the removal of these materials from the Lawrence Livermore National Laboratory by the end of 2012, and
  - Reducing security, safety, and environmental risks by consolidating and disposing of excess nuclear materials wherever possible.
- Support the development and implementation of arms control, nonproliferation, and civil nuclear energy agreements by:
  - Providing technical and policy support to U.S. delegations negotiating arms control, nonproliferation, and peaceful nuclear energy cooperation agreements;
  - Developing the technologies and approaches needed to verify compliance with negotiated treaties and agreements, and
  - Providing training and technical support to the International Atomic Energy Agency.
- Support U.S. commitments through construction of the Mixed Oxide Fuel Fabrication Facility and Waste Solidification Building to provide a disposition pathway for excess U.S. fissile materials, and to help Russia implement its reciprocal commitments.
- Continue our successful programs to secure and/or eliminate vulnerable nuclear and radioactive material in other countries, enhance nuclear/radiological material detection capabilities at borders, airports, and seaports, and strengthen nonproliferation practices and standards worldwide.
- Embark on the design and development of an advanced reactor core and propulsion plant supporting the timely replacement of the *Ohio* class submarine.
- Overhaul of the land-based prototype reactor plant used to test advanced materials and techniques in a realistic operating environment prior to their inclusion in propulsion plants.
- Honor the commitments made to those who won the Cold War by ensuring their pensions are secure in times of financial uncertainty.

Today, I'd like to testify on our efforts in Weapons Activities, Defense Nuclear Nonproliferation, and Naval Reactors.

WEAPONS ACTIVITIES OVERVIEW

The NNSA will ensure that our nuclear stockpile remains safe, secure and effective to deter any adversary, and provide a defense umbrella to our allies. At the same time, NNSA will continue to pursue a modern more flexible Nuclear Security Enterprise that is significantly smaller than the Cold War complex, but is able to address a variety of stockpile scenarios.

As I have committed to you previously, NNSA continues to retire and dismantle nuclear weapons. By 2012 our stockpile will be one-quarter of the size it was at the end of the Cold War. As the United States prepares for the 2010 Review Conference of the Nuclear Nonproliferation Treaty, this fact alone should emphasize the commitment we make to both our Nation and to the world.

As a full partner in the NPR, the NNSA is working with the Departments of Defense and State to establish the plans, policies, and programs that will govern the future posture of our nuclear forces and supporting infrastructure. The recently issued report of the Bipartisan Congressional Commission on the Strategic Posture of the United States will help guide these efforts. These reviews will assist the U.S. Congress and the administration in clearly defining our future direction.

As the NPR proceeds, NNSA continues to carry out a number of activities in support of the stockpile including warhead surveillance, assessment, replacement of limited life components in existing weapon systems, and dismantlements. We are also continuing the W76 Life Extension Program and a feasibility study with the Air Force for a Life Extension Program for some models of the B61 gravity bomb. There are also activities planned in the six campaigns and the studies needed for Annual Assessment of the stockpile.

The NNSA will also continue transforming the Nuclear Security Enterprise into a modern, smaller, and more flexible complex. The NNSA inherited a system of laboratories and production plants designed to produce large volumes of weapons and designs needed to counter Soviet aggression. We have initiated a major effort to right-size the enterprise to meet the new, anticipated requirements. The NNSA is consolidating Category I and II Special Nuclear Materials; removing these items from selected sites and providing safe, secure storage for this material.

In fiscal year 2010, we will be reducing our infrastructure footprint through the deactivation and decommissioning of buildings such as buildings 9206 and 9201 at Y–12. We will also plan for the future infrastructure through continuing design of the Uranium Processing Facility at Y–12, the Pit Disassembly and Conversion Facility at the Savannah River Site, and the Chemistry and Metallurgy Research Replacement Facility at the Los Alamos National Laboratory, and begin the process of planning for an orderly migration of missions to a smaller and more flexible facility at the Kansas City Plant.

The NNSA has received assistance in our ability to alter our infrastructure in the form of an increase in the General Plant Projects limit. We are pleased with the decision to increase the ceiling on General Plant Projects from $5 million to $10 million. We believe that this aids in the maintenance and repair of the enduring enterprise. Following on this increase, the NNSA is submitting a legislative proposal to similarly increase the design cost limit for these construction projects from $600,000 to $1,500,000. We seek your support for the proposal.

But while NNSA is reducing its footprint, and while the total number of warheads in the stockpile continues to decline, there are capabilities that must be preserved. Not only are these capabilities needed to support the maintenance of any stockpile, but they are also needed to support the Nuclear Security Enterprise's initiatives in nonproliferation, nuclear counterterrorism, nuclear forensics, and nuclear incident response. It's important to note that the enterprise does not scale linearly with the size of the stockpile; and the need for baseline functional capabilities is not eliminated with cessation of research into new designs and the cessation of any production of new weapons systems. These capabilities are needed whether we have a few warheads, or a few thousand.

Although NNSA did not receive any funds directly from the American Recovery and Reinvestment Act, we are assisting other parts of the Department in implementing their plans for stimulus work at the NNSA sites and stand ready to do more.

As NNSA prepares for the future, we must focus on the retention of our scientific, technical, and engineering personnel throughout the complex. Without experienced scientific, technical, and engineering personnel, NNSA cannot succeed at its mission. Throughout the cold war we were able to attract the Nation's brightest scientists,

engineers, and technical professionals by providing challenges, facilities, and opportunities that were unique, were on the forefront of science, and that allowed them to put their talents to work to serve their country. Today we are transitioning our emphasis to a broader nuclear security mission, but our need to attract the best scientists, engineers and technical professionals remains. By developing new scientific tools such as the National Ignition Facility, new challenges such as the detection of smuggled uranium and plutonium, and the modernization of facilities such as the Chemistry and Metallurgy Research Replacement Facility, we can continue to attract bright technical minds who wish to serve their country. We believe that our response to the spectrum of threats to national security is not only the right steps for us to take to make the Nation more secure, but also will provide a significant set of technical areas that will motivate young scientists to join us in our mission.

The challenges are huge and meeting them calls upon both basic science and applied technology. Approximately 70 years ago, Hans Bethe advanced the state of science with his critical work explaining the physical processes governing the life cycles of stars. Today the National Ignition Facility (NIF) stands on the threshold of producing stellar conditions in the laboratory. By moving the enterprise forward in advancing the boundaries of science, we will continue to attract our Nation's brightest minds to our scientific endeavors. In fiscal year 2009, two significant technological milestones were achieved; crossing the one mega joule threshold with NIF and the one petaflop threshold in the Advanced Simulation and Computing Campaign.

DEFENSE NUCLEAR NONPROLIFERATION OVERVIEW

As part of the President's comprehensive strategy to address the international nuclear threat, the President also called for strengthening the Nuclear Nonproliferation Treaty, accelerating our efforts to secure vulnerable nuclear materials around the world, and increasing our work to detect, deter, and eliminate illicit trafficking of nuclear materials. The NNSA Nuclear Security Enterprise is actively engaged in these and other nonproliferation missions and will provide the technical expertise to ensure they are successful.

The movement of funding for the Mixed Oxide Fuel Fabrication Facility and the Waste Solidification Building into the Fissile Materials Disposition budget is the largest change in the fiscal year 2010 Congressional Budget for Defense Nuclear Nonproliferation program. These critical facilities provide the nonproliferation programs a disposition pathway for at least 34 metric tons of surplus U.S. weapons grade plutonium. I'm pleased to report that the U.S. and Russia have agreed on a revised Russian program to dispose of Russia's 34 metric tons of their surplus weapons plutonium. These changes will be codified in a Protocol that will amend the 2000 U.S.-Russian Plutonium Management and Disposition Agreement, and we expect to sign the Protocol this summer. In light of President Obama's recent statements in Prague and London, I am particularly pleased that the U.S. and Russian plutonium disposition programs are coming together at this time. As a result of these efforts, the U.S. and Russia will ultimately dispose of enough weapons plutonium for at least 17,000 nuclear weapons.

I should note also that with this budget request, we are submitting our last request for funding to eliminate the production of weapons-grade plutonium production in Russia by December 2010, through the shutdown of Russia's last weapons-grade plutonium production reactor in Zheleznogorsk.

The NNSA directly supports President Obama's goal to accelerate efforts to secure all vulnerable nuclear material from around the world within 4 years, including the expansion and acceleration of our existing efforts. The NNSA is the key agency supporting the administration's goal of minimizing the use of highly-enriched uranium (HEU) in the civil nuclear sector through our program to shutdown entirely or convert HEU fueled research reactors to the use of low-enriched uranium fuel. In fiscal year 2010, we will direct significant funding to the Global Threat Reduction Initiative mission to eliminate and protect vulnerable nuclear and radiological materials located at civilian sites worldwide.

In fiscal year 2010, we will also improve the physical security of nuclear material, as well as facilitate the development and implementation of material control and accountability procedures, and train personnel, to protect a total of 73 nuclear sites throughout Russia and the former Soviet republics. The NNSA will fulfill the administration's goal of securing nuclear weapons-usable material by ensuring that the material possessed by the Russian Navy, the Russian Ministry of Defense, Rosatom and Russian civilian sites is secured.

But improving the security of weapons-usable material at its source is only the start. We must also develop a Second Line of Defense in order to anticipate the pos-

sibility that nuclear weapons-usable material could be smuggled out and transported across international borders. In fact, we know that illicit trafficking in nuclear and other radioactive materials continues, especially in Eastern Europe, the Caucasus, and Central Asia. In response to the President's charge to do more to combat nuclear trafficking, we will install additional radiation detection equipment at 42 foreign sites across Europe, Asia, and North America, and provide detection equipment in 15 additional ports where cargo is loaded for shipment to the U.S.

This work started several years ago. Technology advances and foreign personnel turnover have occurred since NNSA first began securing sites and borders in foreign countries. Funds will be used not only to perform new installations and train personnel at new sites, but will also be used to upgrade older equipment at existing sites, and to provide refresher training to foreign security professionals.

Additionally, in fiscal year 2010, NNSA will expand and accelerate its Next Generation Safeguards Initiative (NGSI), adding $15 million to revitalize the U.S. technical and human capital base necessary to strengthen the international safeguards system and the International Atomic Energy Agency, in line with President Obama's charge in Prague. The NGSI complements related NNSA priorities to reduce proliferation risks associated with growing international interest in the use of nuclear power; to expand export control training and outreach; to develop and implement reliable fuel services as an alternative to the further spread of enrichment and reprocessing capabilities; and—consistent with the President's call for progress towards a world without nuclear weapons—to provide technical support for negotiations of the START follow-on agreement, Comprehensive Nuclear Test-Ban Treaty, and a verifiable Fissile Material Cutoff Treaty.

NAVAL REACTORS OVERVIEW

The NNSA also contributes to national security through the Naval Reactors Program. This program ensures that the nuclear propulsion plants aboard our Navy's warships remain safe and reliable for their complete service lives. Over 40 percent of the Navy's major combatants are nuclear-powered. All of the Nation's aircraft carriers, attack submarines, guided missile submarines, and ballistic missile submarines enjoy the significant operational advantage afforded by nuclear power, including speed, endurance, and enhanced combat payload. Through NNSAs efforts, nuclear-powered warships are on station where American interests are threatened, and ready to conduct sustained combat operations.

For over 60 years, the Naval Reactors program has had complete responsibility for all aspects of Naval Nuclear Propulsion. The Naval Nuclear Propulsion Program currently supports 82 active nuclear-powered warships and 103 operating reactors. This represents eight propulsion plant designs, in seven classes of ships, as well as a training platform.

Naval Reactors funding supports safe and reliable operation of the Nation's Nuclear Fleet. This includes providing rigorous oversight, analysis of plant performance and conditions, as well as addressing emergent operational issues and technology obsolescence for 71 submarines, 11 aircraft carriers, and 4 research and development and training platforms. This funding also supports new plant design projects (i.e., reactor plant for the *Gerald R. Ford*-class aircraft carrier and alternative lower-cost core for *Virginia*-class submarines), as well as ensuring proper storage of naval spent nuclear fuel, prudent recapitalization of aging facilities, and remediation of environmental liabilities.

The *Ohio*-class SSBNs, which are the most survivable leg of the U.S. Strategic Forces, are approaching the end of their service lives. The Navy recently completed studies for a follow-on replacement to the *Ohio*-class and is funding the commencement of design work in fiscal year 2010. NNSA funding in fiscal year 2010 supports reactor core and propulsion plant design and development efforts to support this replacement.

Since 1978, the land-based prototype reactor plant (S8G) has provided an essential capability to test required changes or improvements to components and systems prior to installation in operational ships. The prototype has also provided required, high-quality training for new sailors preparing to operate the Nation's nuclear-powered vessels. This land-based prototype will run out of fuel and require a refueling overhaul starting in 2018. This overhaul and the resultant opportunity to test advanced materials and manufacturing techniques in a caustic operating environment will significantly mitigate risk in the *Ohio* Replacement reactor plant design. To support the refueling overhaul schedule, concept studies and systems design and development efforts will begin in 2010.

The Expended Core Facility, located at the Naval Reactors Facility on the Idaho National Laboratory, is the central location for Naval spent nuclear fuel receipt, in-

spection, dissection, packaging for dry storage, and temporary storage, as well as detailed examination of spent cores and irradiation specimens. Continuous, efficient operation of this facility is vital to ensure the United States can support fuel handling operations in our shipyards conducting construction, repair, and restoration of nuclear ships. The existing facility and related infrastructure is over 50 years old and requires recapitalization. The mission need for recapitalizing this capability has been approved and conceptual design efforts begin in 2010.

The Program continues to explore and develop potentially advanced technologies that could deliver a compellingly better energy source for nuclear ships. For example, using a supercritical carbon dioxide energy conversion as a replacement for the traditional steam cycle is envisioned to be significantly smaller for the same power output, simpler, more automated, and more affordable. Leveraging existing university, industry, and Nuclear Security Enterprise scientific and engineering work in this technology, conceptual development and small-scale testing is underway to support eventual megawatt-scale testing and prototyping.

Acquisition of a new surface combatant (i.e., cruiser) in support of new ballistic missile defense and anti-air warfare mission requirements are currently under evaluation by the Navy. Based on these mission requirements, this new ship will potentially require higher energy capacity and output than is currently available from traditional fossil fueled power plants. Further, the National Defense Authorization Act (NDAA) for 2008 authorizes the Navy to construct all future major combatant vessels with integrated nuclear power systems unless this requirement is waived by the Secretary of Defense. The Navy is currently analyzing alternative shipboard systems that will determine final power plant requirements. Should the Navy decide to pursue a nuclear-powered cruiser in its current long-range shipbuilding plan, DOE-cognizant reactor core and propulsion plant design and development will be required.

The value of nuclear power for naval propulsion is well recognized and the demand for its inherent capabilities remains strong. By taking every opportunity for economies in our work and business practices, we have made a concerted effort to meet the Navy's demand for new propulsion plant designs while assuring the safe and reliable operation and maintenance of the existing fleet. However, the need to deal with a formidable collection of new challenges coupled with the Program's aging infrastructure and environmental legacies requires a fortified level of resource commitment.

NNSA Budget Summary by Appropriation

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2009 Supplemental Request	FY 2010 Request
National Nuclear Security Administration				
Office of the Administrator	402,137	439,190	0	420,754
Weapons Activities	6,302,366	6,380,000	0	6,384,431
Defense Nuclear Nonproliferation	1,656,922	1,482,350	89,500	2,136,709
[non-add MOX Project funded in other appropriations]	[278,879]	[487,008]	N/A	N/A
Naval Reactors	774,686	828,054	0	1,003,133
Total, NNSA	**9,136,111**	**9,129,594**	**89,500**	**9,945,027**
Rescission of Prior Year Balances	-322,000			
Total, NNSA (OMB Scoring)	**8,814,111**			

NNSA Future-Years Nuclear Security Program

(dollars in thousands)

	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
NNSA					
Office of the Administrator	420754	424,962	429,211	433,504	437,838
Weapons Activities	6,384,431	6,356,635	6,350,472	6,339,946	6,335,066
Defense Nuclear Nonproliferation	2,136,709	2,227,276	2,284,049	2,439,019	2,595,190
Naval Reactors	1,003,133	950,786	950,334	948,978	948,717
Total, NNSA	**9,945,027**	**9,959,659**	**10,014,066**	**10,161,447**	**10,316,811**

The NNSA FY 2010 Congressional Budget Request is $9.9 billion, a total of $815.4 million above the FY 2009 appropriations. Of the 8.9 percent increase, about 7 percent is attributable to the re-location of funding for the Mixed Oxide Fuel Fabrication facility project back to NNSA in the Defense nuclear Nonproliferation appropriation.

The NNSA budget justification contains information for five years as required by Section 3253 of P.L. 106-065, entitled *Future-Years Nuclear Security Program (FYNSP)*. The FY 2010-2014 FYNSP projects $50.4 billion for NNSA programs through 2014. The principal increases from the FY 2009-2013 FYNSP are: the transfer of funding for the Mixed Oxide (MOX) Fuel Fabrication Facility project back from the Office of Nuclear Energy to NNSA; the multi-year initiative to further enhance global nuclear nonproliferation efforts; and some of the increase required to support the development of the new generation submarine reactor replacement. For Weapons Activities, the outyear projections reflect only a continuation of current capabilities, pending upcoming strategic nuclear policy decisions. The FY 2011-2015 budget process is expected to present a fully integrated Future Years Nuclear Security Program budget aligned with the new strategic direction and program requirements for all of the NNSA programs.

NNSA Budget Summary by Appropriation and Program

Weapons Activities Appropriation
The Weapons Activities appropriation funds five NNSA program organizations. [There are six subheadings below. Combining "Site Stewardship" and "Infrastructure and Environment" would reduce the count to five and mirror the NNSA structure.] The FY 2010 Congressional Budget Request is $6.4 billion for Weapons Activities, essentially level with FY 2009 appropriation.

Defense Programs
The FY 2010 Congressional Budget Request for Defense Programs is $5.0 billion, a decrease of 1.1 percent from the FY 2009 appropriation that is primarily attributable to transitioning the Pit Disassembly and Conversion Facility and the Waste Solidification Building to other programs. The outyear projections for Defense Programs reflect a continuation of current programs and services pending further national nuclear policy direction expected during 2009.

Within the President's Budget request level, the NNSA will continue all programs to meet the immediate needs of the stockpile, stockpile surveillance, annual assessment, and Life Extension Programs (LEP). As directed by the Nuclear Weapons Council, a feasibility and cost study was initiated in September, 2008, to investigate the replacement of aging non-nuclear components in the family of B61 bombs, and to study the potential incorporation of modern safety and security features in these systems. Included in the program are efforts to complete the B61 Phase 6.2/6.2A refurbishment study evaluating end-of-life components, aging, reliability, and surety improvement options. The decrease within the Directed Stockpile Work (DSW) request is attributable mainly to the relocation of the funding for the Pit Disassembly and Conversion Facility (PDCF) to Readiness in Technical Base and Facilities (RTBF) and the Waste Solidification Building (WSB) to Defense Nuclear Nonproliferation.

The Campaign activities for Science, Engineering, Inertial Confinement Fusion and Advanced Simulation and Computing maintain the FY 2009 funding level throughout the FYNSP. The Science Campaign consolidates a new subprogram called "Academic Alliances" that encompasses the funding for university grants, alliances, and the joint program with Science. The Engineering campaign increases emphasis on Enhanced Surveillance and Systems Engineering Technology in the FY 2010 Congressional Budget Request. The Inertial Confinement Fusion Ignition and High Yield Campaign is requested at $437 million, and in FY 2010, the emphasis shifts away from NIF assembly and toward Facility Operations as the program continues to refine requirements and prepare for the first ignition experiments in 2010. The FY 2010 Congressional Budget Request for the Advanced Simulation and Computing Campaign provides growth in physics and engineering models as support shifts away from hardware procurements and system software.

The Readiness Campaign funds the development and deployment of modern manufacturing capabilities to produce materials and components in compliance with weapon design and performance requirements and in accordance with Life Extension Program and refurbishment schedules. In FY 2010, the Readiness Campaign will focus on supporting the Tritium Readiness activities and high priority projects to deliver new or enhanced processes, technologies, and

capabilities to meet the current needs of the stockpile. The reduction in Tritium Readiness was planned, and is due to the cyclical nature of production.

The Readiness in Technical Base and Facilities request is $62 million above the FY 2009 appropriations. The increase is attributable to additional funding provided to mitigate increased pension costs at the M&O contractor sites. Within the request for operating expenses, an increase is included for the Kansas City Plant supporting the work for the move to a new, smaller facility. Funding for construction projects is requested at $203 million to sustain ongoing construction and design efforts. The location of funding for the PDCF project has been changed from DSW to RTBF. One new construction project is requested: the Nuclear Facilities Risk Reduction Project at Y-12 will provide maintenance to sustain uranium related capabilities at Building 9212.

The Secure Transportation Asset program is requested at $234.9 million, an increase of 9.6 percent over the FY 2009 appropriation. The STA program plans to acquire a total of three transport category aircraft. One 737-type aircraft will be purchased each year--starting in FY 2010, FY 2011, and FY 2012 to replace the aging aircraft. In addition to the aircraft purchases, the remaining increase will be used for training and equipment.

Nuclear Counterterrorism Incident Response (NCTIR)/Emergency Operations
The NCTIR program responds to and mitigates nuclear and radiological incidents worldwide as the U.S. government's primary capability for radiological and nuclear emergency response. The FY 2010 Congressional Budget Request for these activities is $221.9 million, an increase of 3 percent over FY 2009 appropriations. The increase reflects funding growth in three specific areas of the program – International Emergency Management and Cooperation, Emergency Response, and Render Safe Stabilization Operations. These initiatives support increased efforts to address serious emergency management programs in priority countries, while continuing and completing ongoing programs with the International Atomic Energy Agency (IAEA) and other international partners and countries; scientific breakthroughs for Render Safe Stabilization Operations and the Technical Integration programs and continued implementation of National Technical Nuclear Forensics for pre- and post-detonation phases and the Stabilization aspect of nuclear emergencies through development of first generation stabilization equipment including training and maintenance programs to selected teams nationwide in support of better emergency response capability.

Infrastructure and Environment
This organization is responsible for the Facilities and Infrastructure Recapitalization Program, (FIRP) and the new Site Stewardship Program which encompasses Environmental Projects and Operations (EPO) that provides for Long-Term Stewardship (LTS) at NNSA sites after remediation is completed by the DOE Office of Environmental Management, Nuclear Materials Integration, Stewardship Planning which contains a renewable energy efficiency project; and may ultimately include deactivation and demolition activities.

The FY 2010 Congressional Budget Request for FIRP is $154.9 million, an increase of 5 percent above FY 2009. This provides funding for recapitalization, infrastructure planning and construction. The increase supports continued progress in restoring the condition of mission

critical facilities and infrastructure across the Nuclear Security Enterprise to an acceptable condition. The program's original goals established in FY 2003 include: elimination of $1.2 billion of deferred maintenance, achieving a Facility Condition Index (FCI) of 5 percent, and elimination of 3 million gsf of excess facilities. The original $1.2 billion deferred maintenance buydown goal is based on the requirement to meet the FIRP commitment of 5 percent FCI for all facilities. The program's deferred maintenance goal was adjusted in FY 2007 to eliminate $900 million of deferred maintenance by FY 2013 as a result of transformation decisions that reduced facility deferred maintenance requirements. The principle assumption governing FIRP is that the program will be funded only through FY 2013.

The FY 2010 Congressional Budget Request for Facilities and Infrastructure Recapitalization is $154.9 million, an increase of 5 percent above FY 2009. This provides funding for recapitalization, infrastructure planning and construction. The increase supports continued progress in restoring the condition of mission essential facilities and infrastructure across the Nuclear Security Enterprise to an acceptable condition.

The FY 2010 Congressional Budget Request for the new GPRA Unit, Site Stewardship, is $90.4 million. The goal of the Site Stewardship Program is to ensure environmental compliance and energy and operational efficiency throughout the Nuclear Security Enterprise, while modernizing, streamlining, consolidating, and sustaining the stewardship and vitality of the sites as they transition within NNSA's plans for transformation. The Site Stewardship program will institute and maintain a robust operational framework at the NNSA government-owned, contractor-operated sites that encompass responsibility for achieving the NNSA mission. This new GPRA Unit will encompass activities currently under Environmental Projects and Operations (EPO) and will include new subprogram elements Nuclear Materials Integration (NMI) and Stewardship Planning. In the I&E organization only EPO was funded (as a separate GPRA unit) in FY 2008 and FY 2009 and is reflected as such for those two years since this is a non-comparable budget submission. The Environmental Programs and Operations increases 7 percent over the FY 2009 appropriation to address ongoing and new regulatory-driven Long Term Stewardship activities at NNSA sites where Environmental Management activities have been completed. Nuclear Materials Integration provides focused attention on the consolidation and disposition of specific NNSA special nuclear materials. Current activities include the de-inventory of security Category I and II Special Nuclear Material (SNM) from LLNL and also the consolidation and disposal of inactive actinides at other sites. Funds for these material consolidation and disposal activities are being transferred from Defense Programs to Infrastructure and Environment in FY 2010.

The majority of the requested FY 2010 funding increase of $28 million is in Stewardship Planning for an operating expense-funded project, the Pantex Renewable Energy Project (PREP) at the Pantex Plant, that will create a more flexible, more reliable, and environmentally friendly source of renewable energy that supports DOE/NNSA operating goals and missions. The PREP will generate surplus electrical energy, reduce greenhouse gas emissions at local power plants, enhance energy security, and create jobs. This modular, operating expense-funded project will play a key role in satisfying NNSA's renewable energy objectives consistent with DOE Order 430.2B, Departmental Energy, Renewable Energy and Transportation Management.

Defense Nuclear Security
The FY 2010 Congressional Budget Request for Defense Nuclear Security is $749.0 million to support the base program and on sustaining the NNSA sites 2003 Design Basis Threat baseline operations, and begin initial steps to implement the Department's new Graded Security Protection (GSP) policy. During FY 2010, the program will focus on eliminating or mitigating identified vulnerabilities across the Nuclear Security Enterprise. Funding for one new construction start is requested for the Security Improvements Project (SIP). The SIP will install a new security system to manage and integrate personnel security and access control systems at the Y-12 National Security Complex.

Starting in FY 2009, there is no longer an "offset" in this account or the Departmental Administration Appropriation for the security charges associated with reimbursable work. In the FY 2010 Congressional Budget Request, mission -driven activities will continue to be fully funded with direct appropriations, but security required for Work for Others will be covered as part of full cost recovery for these projects. Institutional security activities will continue to be funded by indirect or general and administrative costs at each site.

Cyber Security
The Cyber Security program will sustain the NNSA infrastructure and upgrade elements that will counter cyber threats from external and internal attacks using the latest available technologies.

The FY 2010 Congressional Budget Request for Cyber Security is $122.5 million, an increase of 1 percent over the FY 2009 appropriations. The Cyber Security program is in the process of a major five-year effort focused on revitalization, certification, accreditation and training across the NNSA enterprise. Revitalization enables NNSA to respond to its highest priorities and to address current and future risks; certification and accreditation assure proper documentation of risks and justification of associated operations for systems at all sites; and, education and awareness provides training for federal and contractor personnel to meet expanding skill requirements of NNSA cyber security and information environments.

Defense Nuclear Nonproliferation (DNN) Appropriation
The DNN program goal is to detect, prevent, and reverse the proliferation of Weapons of Mass Destruction (WMD). Our programs address the threat that hostile nations or terrorist groups may acquire weapons of mass destruction or weapons-usable material, dual-use production or technology, or WMD capabilities, by securing or eliminating vulnerable stockpiles of weapon-usable materials, technology, and expertise in Russia and other countries of concern.

The FY 2010 Congressional Budget Request for the DNN appropriation totals $2.1 billion. The most significant FY 2010 and outyear increases relate to the request to move the funding for the MOX Fuel Fabrication Facility project and the WSB back to NNSA's DNN Programs. The NNSA has funded the MOX Fuel Fabrication Facility project and the WSB baseline increases within the requested funding for FY 2010 and the outyears. Other increases include International Materials Protection and Cooperation (INMP&C) and Nonproliferation and International Security (NIS), both of which increase 38 percent over the FY 2009 levels.

Funding in the INMP&C FY 2010 Congressional Budget Request of $552.3 million is an increase of 38 percent over the FY 2009 appropriated level. This increase is the first step in

fulfilling President Obama's promise during his Prague address that the United States will expand its partnership with Russia and pursue new partnerships to eliminate or secure vulnerable nuclear materials. This budget provides for sustainability support to Russian warhead and material sites with completed INMP&C upgrades, INMP&C upgrades to areas/buildings agreed to after the Bratislava Summit and the projects to assist the Russian Federation and other partner countries in establishing the necessary infrastructure to sustain effective MPC&A operations. In addition, the budget provides for the Second Line of Defense program and the installation of radiation detection equipment at 43 foreign sites and
15 Megaports.

The FY 2010 Congressional Budget Request for the NIS program is $207.2 million, an increase of 38 percent over the FY 2009 appropriations. This supports the Next Generation Safeguards Initiative (NGSI), which aims to strengthen the international safeguards system and revitalize the U.S. technical base and the human capital that supports it; as well as nuclear disablement, dismantlement, and verification activities in North Korea; policy and technical support for U.S. efforts to address proliferation by Iran, North Korea and proliferation networks; and the implementation of nuclear arms reduction and associated agreements.

The FY 2010 Congressional Budget Request for the Global Threat Reduction Initiative (GTRI) is $353.5 million, a 10.5 percent reduction from the FY 2009 appropriations. Most of this decrease results from the completion of the Kazakhstan Spent Fuel work in CY 2010. The FY 2010 Congressional Budget Request of $24.5 million for the Elimination of Weapons Grade Plutonium Production (EWGPP) is the final increment of U.S. funding needed for this program. The significant reduction in the budget reflects close-out and completion of the construction activities for the Zheleznogorsk Project.

The Nonproliferation and Verification R&D program is requested at $297.3 million, a decrease from the FY 2009 level. This decrease reflects both an unrequested congressional addition in 2009 and NNSA's funding in 2009 of the total required in 2009 and 2010 for the Physical Sciences building in Washington State. The $297.3 million is sufficient to support long-term R&D leading to detection systems for strengthening U.S. capabilities to respond to current and projected threats to national and homeland security posed by the proliferation of nuclear weapons and diversion of special nuclear material. Almost a third of this funding is for production of operational nuclear detonation detection sensors to support the nation's operational nuclear detonation detection and reporting infrastructure through joint programs with DoD.

The President's Request for Fissile Materials Disposition is $701.9 million, reflecting the transfer of funding for the MOX Fuel Fabrication Facility project and WSB projects back to this program. In addition to these U.S. plutonium disposition activities, the program supports three other principal elements: efforts to dispose of U.S. HEU declared surplus to defense needs primarily by down-blending it into low enriched uranium; technical analyses and support to negotiations among the United States, Russia, and the International Atomic Energy Agency on monitoring and inspection regimes required by a 2000 U.S.-Russia plutonium disposition agreement; and limited support for the early disposition of Russia's plutonium in that country's BN-600 reactor including U.S. technical support to oversee work in Russia for early disposition of Russian weapon-grade plutonium in fast reactors. The U.S. and Russia began negotiations on

amendments to the 2000 Agreement in 2008, and expect to complete the negotiations this summer.

Naval Reactors Appropriation

The NNSA's Naval Reactors program continues to provide the U.S. Navy with safe, military effective nuclear propulsion plants and ensure their continued safe and reliable operation. The FY 2010 Congressional Budget Request for Naval Reactors is $1,003.1 million, an increase of 21 percent over the FY 2009 appropriations.

This increase provides additional funding to initiate the new mission work for the design and delivery of a new reactor core and propulsion plant to support the next-generation submarine design, and refueling of the S8G Prototype, one of two land-based reactor plant prototypes that serve as a testing platform for nuclear technology. Significant outyear funding is required for both of these activities. A portion of the FY 2010 increase will also support Naval Reactors pension responsibilities.

Office of the Administrator Appropriation

This appropriation provides corporate direction, federal personnel, and resources necessary to plan, manage, and oversee the operation of the NNSA. It provides funding for all Federal NNSA staff in Headquarters and field locations except those supporting Naval Reactors and the Secure Transportation Asset agents and transportation staff.

The FY 2010 Congressional Budget Request of $420.8 million reflects a decrease of $18.4 million that is attributable to Congressionally-directed projects funded in FY 2009. Staffing increases in FY 2010 by 28 full time equivalents (FTEs) from 1,942 to 1,970 reflecting functional transfers and growth to accommodate mission program increases. The projected staffing level for FY 2010 is 1,970 and is maintained throughout the outyear period. The Historically Black Colleges/Hispanic Serving Institutions programs will continue through FY 2010 on grants made by appropriations provided in FY 2009 and through program funding. The FY 2010 Congressional Budget Request includes $4.1 million for the Massie Chairs and related activities only.

Budget Tables for the National Nuclear Security Administration

National Nuclear Security Administration

Overview
Appropriation Summary

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2009 Supplemental Request	FY 2010 Request
National Nuclear Security Administration				
Office of the Administrator	402,137	439,190	0	420,754
Weapons Activities	6,302,366	6,380,000	0	6,384,431
Defense Nuclear Nonproliferation	1,656,922	1,482,350	89,500	2,136,709
[non-add MOX Project funded in other appropriations]	[278,879]	[487,008]	N/A	N/A
Naval Reactors	774,686	828,054	0	1,003,133
Total, NNSA	**9,136,111**	**9,129,594**	**89,500**	**9,945,027**
Rescission of Prior Year Balances	-322,000			
Total, NNSA (OMB Scoring)	**8,814,111**			

Outyear Appropriation Summary
NNSA Future-Years Nuclear Security Program (FYNSP)

(dollars in thousands)

	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
NNSA					
Office of the Administrator	420754	424,962	429,211	433,504	437,838
Weapons Activities	6,384,431	6,356,635	6,350,472	6,339,946	6,335,066
Defense Nuclear Nonproliferation	2,136,709	2,227,276	2,284,049	2,439,019	2,595,190
Naval Reactors	1,003,133	950,786	950,334	948,978	948,717
Total, NNSA	**9,945,027**	**9,959,659**	**10,014,066**	**10,161,447**	**10,316,811**

Office of the Administrator
National Nuclear Security Administration

Overview

Appropriation Summary by Program

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation [a]	FY 2010 Request [b]
Office of the Administrator			
Office of the Administrator	379,997	415,878	431,074
Congressional Directed Projects	22,140	23,312	0
Use of prior year balances	0	0	(10,320)
Total, Office of the Administrator	**402,137**	**439,190**	**420,754**

Public Law Authorization:
FY 2009 Omnibus Appropriations Act (P.L. 111-8)
National Nuclear Security Administration Act (P.L. 106-65), as amended

Outyear Appropriation Summary

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Office of the Administrator	**424,962**	**429,211**	**433,504**	**437,838**

[a] The FY 2009 Omnibus Appropriations Act report language states, "The Department is directed to transfer $10,000,000 from the Office of the Administrator to the Non-Defense Environmental Cleanup account for cleanup efforts at Argonne National Laboratory."

[b] The FY 2010 program level for the Office of the Administrator will be achieved through the planned use of prior year unobligated balances in the amount of $10,320,000.

Office of the Administrator

Congressional Directed Projects

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation [a]	FY 2009 Original Appropriation	FY 2010 Request
Congressionally Directed Projects	22,140	23,312	0

[a] Reflects a rescission of $360,000 as cited in the FY 2008 Consolidated Appropriations Act (P.L. 110-161).

Weapons Activities

Funding Profile by Subprogram

	(dollars in thousands)		
	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Weapons Activities			
Directed Stockpile Work	1,405,602	1,590,152	1,514,651
Science Campaign	286,274	316,690	316,690
Engineering Campaign	168,548	150,000	150,000
Inertial Confinement Fusion Ignition and High Yield Campaign	470,206	436,915	436,915
Advanced Simulation and Computing Campaign	574,537	556,125	556,125
Pit Manufacturing and Certification Campaign	213,831	0	0
Readiness Campaign	158,088	160,620	100,000
Readiness in Technical Base and Facilities	1,635,381	1,674,406	1,736,348
Secure Transportation Asset	211,523	214,439	234,915
Nuclear Counterrorism Incident Response	158,655	215,278	221,936
Facilities and Infrastructure Recapitalization Program	177,861	147,449	154,922
Site Stewardship	0	0	90,374
Environmental Projects and Operations	17,272	38,596	0
Defense Nuclear Security	799,133	735,208	749,044
Cyber Security	105,287	121,286	122,511
Congressionally Directed Projects	47,232	22,836	0
Subtotal, Weapons Activities	**6,429,430**	**6,380,000**	**6,384,431**
Security Charge for Reimbursable Work	-34,000	0	0
Use of Prior Year Balances	-93,064	0	0
Total, Weapons Activities	**6,302,366**	**6,380,000**	**6,384,431**

Public Law Authorization:
FY 2008 Consolidated Appropriations Act (P.L. 110-161)
Omnibus Appropriations Act, 2009 (P.L. 111-8)
National Nuclear Security Administration Act, (P.L. 106-65), as amended

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Weapons Activities				
Directed Stockpile Work	1,522,230	1,485,842	1,531,408	1,553,468
Science Campaign	313,075	311,860	308,223	304,899
Engineering Campaign	118,630	118,170	116,792	144,415
Inertial Confinement Fusion Ignition and High Yield Campaign	431,927	430,251	425,234	420,648
Advanced Simulation and Computing Campaign	549,776	547,643	541,257	535,420
Pit Manufacturing and Certification Campaign	0	0	0	0
Readiness Campaign	84,029	83,704	82,728	81,835
Readiness in Technical Base and Facilities	1,736,779	1,770,867	1,736,475	1,694,224
Secure Transportation Asset	253,902	257,444	255,575	259,146
Nuclear Counterrorism Incident Response	223,178	222,914	222,508	222,300
Facilities and Infrastructure Recapitalization Program	156,764	154,750	154,687	0
Site Stewardship	89,915	91,636	91,261	245,729
Defense Nuclear Security	753,233	752,341	750,972	750,271
Cyber Security	123,197	123,050	122,826	122,711
Congressional Directed Projects	0	0	0	0
Total, Weapons Activities	**6,356,635**	**6,350,472**	**6,339,946**	**6,335,066**

Directed Stockpile Work

Funding Profile by Subprogram

	(dollars in thousands)		
	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Directed Stockpile Work			
Life Extension Programs			
B61 Life Extension Program	57,013	2,123	0
W76 Life Extension Program	189,822	202,920	209,196
Subtotal, Life Extension Programs	**246,835**	**205,043**	**209,196**
Stockpile Systems			
B61 Stockpile Systems	64,125	78,021	124,456
W62 Stockpile Systems	2,122	1,596	0
W76 Stockpile Systems	65,212	66,365	65,497
W78 Stockpile Systems	36,880	42,049	50,741
W80 Stockpile Systems	27,342	31,073	19,064
B83 Stockpile Systems	23,959	24,986	35,682
W87 Stockpile Systems	53,199	36,073	51,817
W88 Stockpile Systems	54,250	48,358	43,043
Subtotal, Stockpile Systems	**327,089**	**328,521**	**390,300**
Reliable Replacement Warhead	**1,527**	**0**	**0**
Weapons Dismantlement and Disposition			
99-D-141-01 Pit Disassembly and Conversion Facility-SRS	22,447	24,883	0
99-D-141-02 Waste Solidification Building-SRS	33,600	40,000	0
Weapons Dismantlement and Disposition	55,408	57,238	84,100
Device Assembly Facility	14,713	0	0
Pit Disassembly and Conversion Facility-O&M	12,664	68,084	0
Subtotal, Weapons Dismantlement and Disposition	**138,832**	**190,205**	**84,100**
Stockpile Services			
Production Support	283,529	293,062	301,484
Research & Development Support	31,386	35,144	37,071
Research & Development Certification and Safety	173,609	187,574	143,076
Management, Technology, and Production	202,795	195,334	200,223
Plutonium Capability	0	155,269	0
Plutonium Sustainment	0	0	149,201
Subtotal, Stockpile Services	**691,319**	**866,383**	**831,055**
Total, Directed Stockpile Work	**1,405,602**	**1,590,152**	**1,514,651**

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Directed Stockpile Work				
Life Extension Programs				
W76 Life Extension Program	206,808	206,005	203,603	236,403
Subtotal, Life Extension Programs	**206,808**	**206,005**	**203,603**	**236,403**
Stockpile Systems				
B61 Stockpile Systems	110,689	138,084	195,768	198,355
W62 Stockpile Systems	0	0	0	0
W76 Stockpile Systems	56,884	51,348	52,883	49,177
W78 Stockpile Systems	47,596	39,077	38,158	41,518
W80 Stockpile Systems	17,599	15,909	18,482	19,444
B83 Stockpile Systems	34,649	34,616	35,447	38,596
W87 Stockpile Systems	55,196	61,555	59,247	46,002
W88 Stockpile Systems	40,120	56,354	60,137	62,069
Subtotal, Stockpile Systems	**362,733**	**396,943**	**460,122**	**455,161**
Weapons Dismantlement and Disposition	**62,464**	**60,783**	**61,928**	**59,544**
Stockpile Services				
Production Support	317,074	295,307	277,715	272,016
Research & Development Support	39,494	35,904	35,517	36,378
Research & Development Certification and Safety	193,516	176,360	183,311	184,090
Management, Technology, and Production	198,387	206,980	201,499	203,590
Pit Manufacturing	0	0	0	0
Pit Manufacturing Capability	0	0	0	0
Plutonium Capability	0	0	0	0
Plutonium Sustainment	141,754	107,560	107,713	106,286
Subtotal, Stockpile Services	**890,225**	**822,111**	**805,755**	**802,360**
Total, Directed Stockpile Work	**1,522,230**	**1,485,842**	**1,531,408**	**1,553,468**

Science Campaign

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Science Campaign			
Advanced Certification	14,866	19,400	19,400
Primary Assessment Technologies	61,844	80,181	80,181
Dynamic Plutonium Experiments	0	23,022	0
Dynamic Materials Properties	95,978	83,231	86,617
Academic Alliances	0	0	30,251
Advanced Radiography	30,282	28,535	22,328
Secondary Assessment Technologies	78,399	76,913	77,913
Test Readiness	4,905	5,408	0
Total, Science Campaign	**286,274**	**316,690**	**316,690**

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Science Campaign				
Advanced Certification	19,316	19,104	18,881	18,678
Primary Assessment Technologies	79,835	78,958	78,038	77,195
Dynamic Plutonium Experiments	0	0	0	0
Dynamic Materials Properties	86,243	85,296	84,301	83,392
Academic Alliances	30,120	29,790	29,442	29,125
Advanced Radiography	19,984	21,987	21,731	21,497
Secondary Assessment Technologies	77,577	76,725	75,830	75,012
Test Readiness	0	0	0	0
Total, Science Campaign	**313,075**	**311,860**	**308,223**	**304,899**

Engineering Campaign

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Engineering Campaign			
Enhanced Surety	34,137	46,112	42,000
Weapon Systems Engineering Assessment Technology	18,814	16,592	18,000
Nuclear Survivability	8,644	21,100	21,000
Enhanced Surveillance	78,573	66,196	69,000
Microsystems and Engineering Sciences Applications (MESA) Other Projects Cosrs (OPC)	7,485	0	0
08-D-806, Ion Beam Laboratory Refurbishment Construction	9,911	0	0
01-D-108, Microsystems and Engineering Sciences Applications (MESA) Construction	10,984	0	0
Total, Engineering Campaign	**168,548**	**150,000**	**150,000**

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Engineering Campaign				
Enhanced Surety	43,431	45,101	44,770	50,064
Weapon Systems Engineering Assessment Technology	13,850	16,938	15,572	20,218
Nuclear Survivability	17,922	9,454	8,760	10,590
Enhanced Surveillance	43,427	46,677	47,690	63,543
MESA OPCs	0	0	0	0
MESA Construction	0	0	0	0
Total, Engineering Campaign	**118,630**	**118,170**	**116,792**	**144,415**

Inertial Confinement Fusion Ignition and High Yield Campaign

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Inertial Confinement Fusion Ignition and High Yield Campaign			
Ignition	103,029	100,535	106,734
Support of Other Stockpile Programs	0	0	0
NIF Diagnostics, Cryogenics, and Experimental Support	68,107	66,201	72,252
Pulsed Power Inertial Confinement Fusion	10,241	8,652	5,000
Joint Program in High Energy Density Laboratory Plasmas	3,152	3,053	4,000
Facility Operations and Target Production	112,012	203,282	248,929
Inertial Fusion Technology	29,426	0	0
NIF Assembly and Installation Program	134,294	55,192	0
High-Energy Petawatt Laser Development	0	0	0
96-D-111, National Ignition Facility	9,945	0	0
Total, Inertial Confinement Fusion Ignition and High Yield Campaign	**470,206**	**436,915**	**436,915**

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Inertial Confinement Fusion Ignition and High Yield Campaign				
Ignition	111,173	94,773	74,410	71,479
Support of Other Stockpile Programs	0	13,102	29,495	29,177
NIF Diagnostics, Cryogenics, and Experimental Support	74,370	75,395	74,921	71,348
Pulsed Power Inertial Confinement Fusion	4,978	4,924	4,866	4,814
Joint Program in High Energy Density Laboratory Plasmas	3,983	3,939	3,893	3,851
Facility Operations and Target Production	237,423	238,118	237,649	239,979
Inertial Fusion Technology	0	0	0	0
NIF Assembly and Installation Program	0	0	0	0
High-Energy Petawatt Laser Development	0	0	0	0
96-D-111, National Ignition Facility	0	0	0	0
Total, Inertial Confinement Fusion Ignition and High Yield Campaign	**431,927**	**430,251**	**425,234**	**420,648**

Advanced Simulation and Computing Campaign

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Advanced Simulation and Computing Campaign			
Integrated Codes	151,984	138,917	138,475
Physics and Engineering Models	65,049	49,284	58,762
Verification and Validation	49,606	50,184	49,781
Computational Systems and Software Environment	185,637	156,733	150,833
Facility Operations and User Support	122,261	161,007	158,274
Total, Advanced Simulation and Computing Campaign	**574,537**	**556,125**	**556,125**

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Advanced Simulation and Computing Campaign				
Integrated Codes	137,975	137,975	137,975	137,975
Physics and Engineering Models	54,798	58,762	58,762	58,762
Verification and Validation	49,781	49,781	49,781	49,781
Computational Systems and Software Environment	150,833	150,833	150,833	150,833
Facility Operations and User Support	156,389	150,292	143,906	138,069
Total, Advanced Simulation and Computing Campaign	**549,776**	**547,643**	**541,257**	**535,420**

Readiness Campaign

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Readiness Campaign			
Stockpile Readiness	18,562	27,869	5,746
High Explosives and Weapon Operations	9,647	8,659	4,608
Nonnuclear Readiness	25,103	30,000	12,701
Tritium Readiness	71,831	71,831	68,246
Advanced Design and Production Technologies	32,945	22,261	8,699
Total, Readiness Campaign	**158,088**	**160,620**	**100,000**

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Readiness Campaign				
Stockpile Readiness	11,199	0	0	0
High Explosives and Weapon Operations	0	0	0	0
Nonnuclear Readiness	7,026	0	0	0
Tritium Readiness	51,371	83,704	82,728	81,835
Advanced Design and Production Technologies	14,433	0	0	0
Total, Readiness Campaign	**84,029**	**83,704**	**82,728**	**81,835**

Pit Manufacturing and Certification Campaign

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Pit Manufacturing and Certification Campaign			
Pit Manufacturing	137,323	0	0
Pit Certification	37,273	0	0
Pit Manufacturing Capability	39,235	0	0
Total, Pit Manufacturing and Certification Campaign	**213,831**	**0**	**0**

Budget Structure Changes

Having successfully reconstituted the capability for producing a replacement plutonium pit for a nuclear weapon, the Pit Manufacturing and Certification Campaign is complete. In FY 2009, Pit Manufacturing and Pit Manufacturing Capability become Plutonium Capability under the DSW Stockpile Services subprogram with other production manufacturing activities. Also in FY 2009, Pit Certification was moved to the Science Campaign and renamed Dynamic Plutonium Experiments.

Readiness in Technical Base and Facilities

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Readiness in Technical Base and Facilities			
Operations of Facilities	1,152,455	1,163,331	1,342,303
Program Readiness	70,099	71,626	73,021
Material Recycle and Recovery	71,567	70,334	69,542
Containers	21,760	22,696	23,392
Storage	34,462	31,951	24,708
Subtotal, Operations and Maintenance	**1,350,343**	**1,359,938**	**1,532,966**
Construction	285,038	314,468	203,382
Total, Readiness in Technical Base and Facilities	**1,635,381**	**1,674,406**	**1,736,348**

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Readiness in Technical Base and Facilities				
Operations of Facilities	1,290,006	1,212,085	1,169,649	1,114,853
Program Readiness	70,945	66,075	65,567	65,117
Material Recycle and Recovery	72,091	66,267	66,258	64,959
Containers	28,653	25,658	24,691	23,541
Storage	24,805	23,089	22,975	22,487
Subtotal, Operations and Maintenance	**1,486,500**	**1,393,174**	**1,349,140**	**1,290,957**
Construction	250,279	377,693	387,335	403,267
Readiness in Technical Base and Facilities	**1,736,779**	**1,770,867**	**1,736,475**	**1,694,224**

Secure Transportation Asset

Overview

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Secure Transportation Asset (STA)			
Operations and Equipment	128,343	127,701	138,772
Program Direction	83,180	86,738	96,143
Total, Secure Transportation Asset	**211,523**	**214,439**	**234,915**

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Operations and Equipment				
Operations and Equipment	158,322	160,165	156,897	159,224
Program Direction	95,580	97,279	98,678	99,922
Total, Operations and Equipment	**253,902**	**257,444**	**255,575**	**259,146**

Secure Transportation Asset

Operations and Equipment

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Operations and Equipment			
Mission Capacity	72,358	70,107	75,038
Security/Safety Capability	18,168	20,617	26,472
Infrastructure and C5 Systems	29,769	25,978	23,217
Program Management	8,048	10,999	14,045
Total, Operations and Equipment	**128,343**	**127,701**	**138,772**

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Operations and Equipment				
Mission Capacity	82,721	82,893	80,286	80,695
Security/Safety Capability	27,516	28,124	27,883	28,582
Infrastructure and C5 Systems	33,486	34,226	33,933	34,783
Program Management	14,599	14,922	14,795	15,164
Total, Operations and Equipment	**158,322**	**160,165**	**156,897**	**159,224**

Secure Transportation Asset

Program Direction

Funding Profile by Subprogram

	(dollars in thousands)		
	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Program Direction			
Salaries and Benefits	73,244	75,226	81,225
Travel	8,741	10,188	11,331
Other Related Expenses	1,195	1,324	3,587
Total, Program Direction	**83,180**	**86,738**	**96,143**
Total, Full Time Equivalents	**567**	**647**	**647**

Outyear Funding Profile by Subprogram

	(dollars in thousands)			
	FY 2011	FY 2012	FY 2013	FY 2014
Program Direction				
Salaries and Benefits	82,157	83,844	84,846	85,658
Travel	11,482	11,827	12,182	12,521
Other Related Expenses	1,941	1,608	1,650	1,743
Total, Program Direction	**95,580**	**97,279**	**98,678**	**99,922**
Total, Full Time Equivalents	**647**	**667**	**667**	**667**

Nuclear Counterterrorism Incident Response

Funding Profile by Subprogram[c]

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Nuclear Counterterrorism Incident Response (Homeland Security)[b]			
Emergency Response (Homeland Security)[b]	131,455	132,918	139,048
National Technical Nuclear Forensics (Homeland Security)[b]	12,000	12,557	10,217
Emergency Management (Homeland Security)[b]	6,479	7,428	7,726
Operations Support (Homeland Security)[b]	8,721	8,207	8,536
International Emergency Management and Cooperation	0	4,515	7,181
Nuclear Counterterrorism (Homeland Security)[b]	0	49,653	49,228
Total, Nuclear Counterterrorism Incident Response	**158,655**	**215,278**	**221,936**

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Nuclear Counterterrorism Incident Response				
Emergency Response (Homeland Security)[b]	138,939	139,222	139,899	141,100
National Technical Nuclear Forensics (Homeland Security)[b]	10,384	10,400	10,500	10,400
Emergency Management (Homeland Security)[b]	7,852	7,500	7,000	6,850
Operations Support (Homeland Security)[b]	8,675	8,692	8,799	8,750
International Emergency Management and Cooperation	7,298	7,300	7,310	7,200
Nuclear Counterterrorism (Homeland Security)[b]	50,030	49,800	49,000	48,000
Total, Nuclear Counterterrorism Incident Response	**223,178**	**222,914**	**222,508**	**222,300**

[c] Effective June 1, 2007, the Office of International Emergency Management and Cooperation was functionally transferred from the Office of Defense Nuclear Non-proliferation (DNN) to Nuclear Counterterrorism Incident Response (NCTIR) in an effort to consolidate emergency mission, functions, authorities and activities within NNSA. Funding that was managed by the NCTIR program, but still resided in the DNN budget, was $6,249,000 for FY 2008, reflecting planned program activities including increases for the Bratislava Agreement. Effective December 2007, the Office of Nuclear Counterterrorism Design Support was functionally transferred from the Office of Defense Programs (DP) to NCTIR in an effort to consolidate emergency mission, functions, authorities and activities within NNSA. FY 2008 funds totaling $53,000,000 resided in DP; however, NCTIR managed the program.

[b] Office of Management and Budget (OMB) Homeland Security designation.

Facilities and Infrastructure Recapitalization Program

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Facilities and Infrastructure Recapitalization Program			
Operations and Maintenance (O&M)			
Recapitalization	87,414	69,226	130,507
Facility Disposition	21,300	0	0
Infrastructure Planning	7,627	10,324	14,452
Subtotal, Operations and Maintenance (O&M)	**116,341**	**79,550**	**144,959**
Construction	61,520	67,899	9,963
Total, Facilities and Infrastructure Recapitalization Program	**177,861**	**147,449**	**154,922**

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Facilities and Infrastructure Recapitalization Program				
Operations and Maintenance (O&M)				
Recapitalization	145,065	142,048	152,073	0
Facility Disposition	0	0	0	0
Infrastructure Planning	11,699	12,702	2,614	0
Subtotal, Operations and Maintenance (O&M)	**156,764**	**154,750**	**154,687**	**0**
Construction	0	0	0	0
Total, Facilities and Infrastructure Recapitalization Program	**156,764**	**154,750**	**154,687**	**0**

Site Stewardship

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Operations and Maintenance			
Environmental Projects and Operations	0	0	41,288
Nuclear Materials Integration	0	0	20,000
Stewardship Planning	0	0	29,086
Total, Operations and Maintenance	**0**	**0**	**90,374**
Construction	**0**	**0**	**0**
Total, Site Stewardship	**0**	**0**	**90,374**

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Operations and Maintenance				
Environmental Projects and Operations	39,026	37,468	36,040	36,900
Nuclear Materials Integration	15,000	15,000	10,000	10,000
Stewardship Planning	13,889	39,168	21,221	158,829
Total, Operations and Maintenance	**67,915**	**91,636**	**67,261**	**205,729**
Construction	**22,000**	**0**	**24,000**	**40,000**
Total, Site Stewardship	**89,915**	**91,636**	**91,261**	**245,729**

Environmental Projects and Operations

Funding Profile by Subprogram

	(dollars in thousands)		
	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Environmental Projects and Operations			
Long-Term Stewardship	17,272	38,596	0
Total, Environmental Projects and Operations	**17,272**	**38,596**	**0**

Safeguards and Security

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Safeguards and Security (S&S)			
Defense Nuclear Security (Homeland Security)			
Operations and Maintenance	728,023	689,510	700,044
Construction	71,110	45,698	49,000
Subtotal, Defense Nuclear Security	**799,133**	**735,208**	**749,044**
Offset for S&S Work for Others	(34,000)	0	0
Total, Defense Nuclear Security	**765,133**	**735,208**	**749,044**
Cyber Security (Homeland Security)	**105,287**	**121,286**	**122,511**
Total, Safeguards and Security	**870,420**	**856,494**	**871,555**

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Safeguards and Security (S&S)				
Defense Nuclear Security (Homeland Security)				
Operations and Maintenance	701,233	707,911	750,972	750,271
Construction	52,000	44,430	0	0
Total, Defense Nuclear Security	**753,233**	**752,341**	**750,972**	**750,271**
Cyber Security (Homeland Security)	**123,197**	**123,050**	**122,826**	**122,711**
Total, Safeguards and Security	**876,430**	**875,391**	**873,798**	**872,982**

Defense Nuclear Security

Funding Profile by Subprogram

	(dollars in thousands)		
	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Defense Nuclear Security			
Operations and Maintenance (Homeland Security)			
Protective Forces	439,106	418,694	443,000
Physical Security Systems	120,873	77,245	74,000
Transportation	1,007	420	0
Information Security	21,072	25,880	25,300
Personnel Security	29,460	31,263	30,600
Materials Control and Accountability	23,978	35,929	35,200
Program Management	82,527	71,364	83,944
Technology Deployment, Physical Security	10,000	9,431	8,000
Graded Security Protection Policy (formerly DBT)	0	19,284	0
Total, Operations and Maintenance (Homeland Security)	**728,023**	**689,510**	**700,044**
Construction (Homeland Security)	71,110	45,698	49,000
Subtotal, Defense Nuclear Security	**799,133**	**735,208**	**749,044**
Offset for S&S Work for Others	-34,000	0	0
Total, Defense Nuclear Security with Offset	**765,133**	**735,208**	**749,044**

Outyear Funding Profile by Subprogram

	(dollars in thousands)			
	FY 2011	FY 2012	FY 2013	FY 2014
Defense Nuclear Security				
Operations and Maintenance (Homeland Security)				
Protective Forces	443,360	447,305	465,803	462,947
Physical Security Systems	77,370	74,727	84,602	84,478
Information Security	26,276	27,353	27,664	27,979
Personnel Security	32,116	33,431	33,812	34,196
Materials Control and Accountability	36,495	37,990	38,423	38,859
Program Management	77,588	78,747	92,215	93,263
Technology Deployment, Physical Security	8,028	8,358	8,453	8,549
Total, Operations and Maintenance (Homeland Security)	**701,233**	**707,911**	**750,972**	**750,271**
Construction (Homeland Security)	52,000	44,430	0	0
Total, Defense Nuclear Security	**753,233**	**752,341**	**750,972**	**750,271**

Cyber Security

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Cyber Security (Homeland Security)			
Infrastructure Program	71,777	93,776	99,011
Enterprise Secure Computing	19,500	25,500	21,500
Technology Application Development	2,010	2,010	2,000
Classified Diskless Workstation Operations	12,000	0	0
Total, Cyber Security (Homeland Security)	**105,287**	**121,286**	**122,511**

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Cyber Security (Homeland Security)				
Infrastructure Program	99,697	95,550	95,326	95,211
Enterprise Secure Computing	21,500	25,500	25,500	25,500
Technology Application Development	2,000	2,000	2,000	2,000
Classified Diskless Workstation Operations	0	0	0	0
Total, Cyber Security (Homeland Security)	**123,197**	**123,050**	**122,826**	**122,711**

Weapons Activities

Congressional Directed Projects

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Congressionally Directed Projects	**47,232**	**22,836**	**0**

Defense Nuclear Nonproliferation

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2009 Supplemental Request	FY 2010 Request
Defense Nuclear Nonproliferation				
Nonproliferation and Verification Research and Development	379,649	363,792	0	297,300
Nonproliferation and International Security	149,993	150,000	9,500	207,202
International Nuclear Materials Protection and Cooperation	624,482	400,000	55,000	552,300
Elimination of Weapons-Grade Plutonium Production	180,190	141,299		24,507
Fissile Materials Disposition	66,235	41,774		701,900
Global Threat Reduction Initiative	199,448	395,000	25,000	353,500
International Nuclear Fuel Bank	49,545	0		
Congressional Directed Projects	7,380	1,903		
Subtotal, Defense Nuclear Nonproliferation	**1,656,922**	**1,493,768**	**89,500**	**2,136,709**
Use of Prior Year Balances	0	-11,418		0
Total, Defense Nuclear Nonproliferation	**1,656,922**	**1,482,350**	**89,500**	**2,136,709**
Rescission of Prior Year Balances	-322,000	0		
Total, Defense Nuclear Nonproliferation (OMB Scoring)	**1,334,922**	**1,482,350**	**89,500**	**2,136,709**

NOTES: The FY 2008 Current Appropriation column includes international contributions of $6,473,368 to Defense Nuclear Nonproliferation programs. FY 2008 subprogram amounts as shown reflect a rescission of $15,279,000 as cited in the FY 2008 Consolidated Appropriations Act (P.L. 110-161). FY 2009 funds appropriated in Other Defense Activities for Fissile Materials Disposition, and in Weapons Activities for the Waste Solidification Building funds are not reflected in the above table.

Public Law Authorization:
Omnibus Appropriations Act, 2009 (P.L. 111-8)
FY 2008 Consolidated Appropriations Act (P.L. 110-161)
National Nuclear Security Administration Act, (P.L. 106-65), as amended

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Defense Nuclear Nonproliferation				
Nonproliferation and Verification Research and Development	318,882	315,941	317,557	328,193
Nonproliferation and International Security	170,888	164,929	169,219	173,923
International Nuclear Materials Protection and Cooperation	583,400	570,799	561,790	558,492
Elimination of Weapons Grade Plutonium Production	0	0	0	0
Fissile Materials Disposition	672,991	580,212	673,143	461,605
Global Threat Reduction Initiative	481,115	652,168	717,310	1,072,977
Total, Defense Nuclear Nonproliferation	**2,227,276**	**2,284,049**	**2,439,019**	**2,595,190**

Nonproliferation and Verification Research and Development

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Nonproliferation and Verification R&D			
Operations and Maintenance (O&M)			
Proliferation Detection	216,857	199,699	171,839
Homeland Security-Related Proliferation Detection [Non-Add]	[50,000]	[50,000]	[50,000]
Nuclear Detonation Detection	130,352	145,633	125,461
Supporting Activities	7,668	0	0
Subtotal, O&M	**354,877**	**345,332**	**297,300**
Construction	24,772	18,460	0
Total, Nonproliferation and Verification R&D	**379,649**	**363,792**	**297,300**

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Nonproliferation and Verification R&D				
Operations and Maintenance (O&M)				
Proliferation Detection (PD)	184,952	183,246	184,183	190,352
Homeland Security-Related Proliferation Detection [Non-Add]	[50,000]	[50,000]	[50,000]	[50,000]
Nuclear Detonation Detection	133,930	132,695	133,374	137,841
Supporting Activities	0	0	0	0
Subtotal, O&M	**318,882**	**315,941**	**317,557**	**328,193**
Construction	0	0	0	0
Total, Nonproliferation and Verification R&D	**318,882**	**315,941**	**317,557**	**328,193**

Nonproliferation and International Security

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Nonproliferation and International Security			
Dismantlement and Transparency	45,709	47,529	92,763
Global Security Engagement and Cooperation	50,912	44,076	50,708
International Regimes and Agreements	44,444	40,793	42,703
Treaties and Agreements	3,879	17,602	21,028
International Emergency Management Cooperation	5,049	0	0
Total, Nonproliferation and International Security	**149,993**	**150,000**	**207,202**

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Nonproliferation and International Security				
Dismantlement and Transparency	58,869	56,816	58,294	59,915
Global Security Engagement and Cooperation	56,830	54,848	56,275	57,839
International Regimes and Agreements	48,648	46,952	48,173	49,512
Treaties and Agreements	6,541	6,313	6,477	6,657
International Emergency Management Cooperation	0	0	0	0
Total, Nonproliferation and International Security	**170,888**	**164,929**	**169,219**	**173,923**

International Nuclear Materials Protection and Cooperation

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
International Nuclear Materials Protection and Cooperation			
Navy Complex	20,339	22,666	33,880
Strategic Rocket Forces/12th Main Directorate	125,885	34,417	48,646
Rosatom Weapons Complex	66,343	56,070	71,517
Civilian Nuclear Sites	63,416	35,542	43,481
Material Consolidation and Conversion	19,608	21,560	13,611
National Programs and Sustainability	71,270	54,901	68,469
Second Line of Defense	257,621	174,844	272,696
Total, International Nuclear Materials Protection and Cooperation	**624,482**	**400,000**	**552,300**

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
International Nuclear Materials Protection and Cooperation				
Navy Complex	42,408	31,764	0	0
Strategic Rocket Forces/12th Main Directorate	44,964	37,831	0	0
Rosatom Weapons Complex	103,497	52,000	0	0
Civilian Nuclear Sites	24,785	18,502	0	0
Material Consolidation and Conversion	14,165	14,306	14,627	14,627
National Programs and Sustainability	62,148	61,967	39,006	39,006
Second Line of Defense	291,433	354,429	508,157	504,859
Total, International Nuclear Materials Protection and Cooperation	**583,400**	**570,799**	**561,790**	**558,492**

Elimination of Weapons-Grade Plutonium Production

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Elimination of Weapons-Grade Plutonium Production (EWGPP)			
Seversk Plutonium Production Elimination (SPPEP)	19,400	0	0
Zheleznogorsk Plutonium Production Elimination (ZPPEP)	159,140	139,282	22,507
Crosscutting and Technical Support Activities	1,400	2,017	2,000
Funds from International Contributions	250	0	0
Total, Elimination of Weapons-Grade Plutonium Production (EWGPP)	**180,190**	**141,299**	**24,507**

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Elimination of Weapons-Grade Plutonium Production				
Seversk Plutonium Production Elimination	0	0	0	0
Zheleznogorsk Plutonium Production Elimination	0	0	0	0
Crosscutting and Technical Support Activities	0	0	0	0
Total, Elimination of Weapons-Grade Plutonium Production	0	0	0	0

Fissile Materials Disposition

Funding Profile by Subprogram

	(dollars in thousands)		
	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Fissile Materials Disposition (FMD)			
U.S. Surplus Fissile Materials Disposition			
Operations and Maintenance (O&M)			
U.S. Plutonium Disposition	0	0	90,896
U.S. Uranium Disposition	66,235	39,274	34,691
Supporting Activities	0	1,500	1,075
Subtotal, O&M	**66,235**	**40,774**	**126,662**
Construction	0	0	574,238
Total, U.S. Surplus FMD	**66,235**	**40,774**	**700,900**
Russian Surplus FMD			
Russian Materials Disposition	0	1,000	1,000
Total, Fissile Materials Disposition	**66,235**	**41,774**	**701,900**

Outyear Funding Profile by Subprogram

	(dollars in thousands)			
	FY 2011	FY 2012	FY 2013	FY 2014
Fissile Materials Disposition				
U.S. Surplus Fissile Materials Disposition (O&M)	139,203	181,113	344,686	350,944
Construction	532,788	398,099	327,457	109,661
Russian Surplus Fissile Materials Disposition	1,000	1,000	1,000	1,000
Total, Fissile Materials Disposition	**672,991**	**580,212**	**673,143**	**461,605**

Global Threat Reduction Initiative (GTRI)

Funding Profile by Subprogram[a] [b]

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Global Threat Reduction Initiative			
Highly Enriched Uranium (HEU) Reactor Conversion	**33,819**	**83,347**	**71,500**
Nuclear and Radiological Material Removal			
Russian Research Reactor Fuel Return	38,896	0	0
U.S. Foreign Research Reactor Spent Nuclear Fuel	9,887	0	0
Emerging Threats and Gap Materials	5,466	0	0
U.S. Radiological Threat Reduction	13,510	0	0
Russian-Origin Nuclear Material Removal	0	130,045	97,000
U.S.-Origin Nuclear Material Removal	0	14,222	10,000
Gap Nuclear Material Removal	0	7,279	51,000
Emerging Threats Nuclear Material Removal	0	8,767	9,500
International Radiological Material Removal	0	18,312	18,500
Domestic Radiological Material Removal	0	15,527	16,000
Subtotal, Nuclear and Radiological Material Removal	**67,759**	**194,152**	**202,000**
Nuclear and Radiological Material Protection			
Kazakhstan Spent Fuel	43,098	0	0
Global Research Reactor Security	3,557	0	0
International Radiological Threat Reduction	44,992	0	0
BN-350 Nuclear Material Protection	0	52,761	9,000
International Material Protection	0	31,950	35,000
Domestic Material Protection	0	32,790	36,000
Subtotal, Nuclear and Radiological Material Protection	**91,647**	**117,501**	**80,000**
Total, Global Threat Reduction Initiative (appropriation)	**193,225**	**395,000**	**353,500**
Funds from International Contributions	**6,223**	**0**	**0**
Total, Global Threat Reduction Initiative Funds Available	**199,448[c]**	**395,000**	**353,500**

[a] Includes the funding from the FY 2007 Supplemental Act (P.L. 110-28) for International Radiological Threat Reduction (IRTR) in FY 2008 in the amount of $20,000,000.

[b] Includes for FY 2008 international contributions from the Government of Canada for $1,975,400; from the Republic of Korea for $250,000, and from the United Kingdom of Great Britain and Northern Ireland for $3,997,968.

[c] FY 2008 funds available of $199,448,000 will be reduced by $1,792,000 to reflect GTRI share of directed reduction in prior-year balances for a revised FY 2008 total of $197,656,000.

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Global Threat Reduction Initiative				
HEU Reactor Conversion	**105,000**	**189,000**	**193,000**	**299,000**
Nuclear and Radiological Material Removal				
Russian-Origin Nuclear Material Removal	168,452	158,000	180,000	250,000
U.S.-Origin Nuclear Material Removal	20,000	30,000	30,000	40,000
Gap Nuclear Material Removal	35,000	75,000	75,000	120,000
Emerging Threats Nuclear Material Removal	15,000	15,000	15,000	15,000
International Radiological Material Removal	20,000	25,000	28,000	33,000
Domestic Radiological Material Removal	20,000	25,000	28,000	33,000
Subtotal, Nuclear and Radiological Material Removal	**278,452**	**328,000**	**356,000**	**491,000**
Nuclear and Radiological Material Protection				
BN-350 Nuclear Material Protection	2,000	2,000	0	0
International Material Protection	44,663	53,168	64,310	119,977
Domestic Material Protection	51,000	80,000	104,000	163,000
Subtotal, Nuclear and Radiological Material Protection	**97,663**	**135,168**	**168,310**	**282,977**
Total, Global Threat Reduction Initiative	**481,115**	**652,168**	**717,310**	**1,072,977**

International Nuclear Fuel Bank

Funding Profile by Subprogram

	(dollars in thousands)		
	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Total, International Nuclear Fuel Bank Program	**49,545**	**0**	**0**

Public Law Authorization:
FY 2008 Consolidated Appropriations Act (P.L. 110-161)

Outyear Funding Profile by Subprogram

	(dollars in thousands)			
	FY 2011	FY 2012	FY 2013	FY 2014
Total, International Nuclear Fuel Bank Program	**0**	**0**	**0**	**0**

Congressional Directed Projects

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Congressionally Directed Projects	**7,380**	**1,903**	**0**

Naval Reactors

Funding Profile by Subprogram

(dollars in thousands)

	FY 2008 Current Appropriation	FY 2009 Original Appropriation	FY 2010 Request
Naval Reactors Development			
Operations and Maintenance (O&M)	732,374	771,600	935,533
Program Direction	32,403	34,454	36,800
Construction	9,909	22,000	30,800
Total, Naval Reactors Development	**774,686**	**828,054**	**1,003,133**

Public Law Authorizations:
P.L. 83-703, "Atomic Energy Act of 1954"
"Executive Order 12344 (42 U.S.C. 7158), "Naval Nuclear Propulsion Program"
P.L. 107-107, "National Defense Authorizations Act of 2002", Title 32, "National Nuclear Security Administration"
John Warner National Defense Authorization Act for FY 2007, (P.L. 109-364)
FY 2008 Consolidated Appropriations Act (P.L. 110-161)
National Nuclear Security Administration Act, (P.L. 106-65), as amended
FY 2009 Consolidated Appropriations Act (P.L. 111-8)

Outyear Funding Profile by Subprogram

(dollars in thousands)

	FY 2011	FY 2012	FY 2013	FY 2014
Naval Reactors Development				
Operations and Maintenance	879,386	888,634	882,878	878,117
Program Direction	37,900	38,800	39,700	40,600
Construction	33,500	22,900	26,400	30,000
Total, Naval Reactors Development	**950,786**	**950,334**	**948,978**	**948,717**

STATEMENT OF MAJ. GEN. C. DONALD ALSTON, USAF, ASSISTANT CHIEF OF STAFF, STRATEGIC DETERRENCE AND NUCLEAR INTEGRATION

[The prepared statement of Major General Alston follows:]

PREPARED STATEMENT BY MAJ. GEN. C. DONALD ALSTON, USAF

INTRODUCTION

Chairman Nelson, Ranking Member Vitter, distinguished members of the committee, thank you for the opportunity to discuss Air Force strategic programs.

In the Executive Summary of the Final Report of the Congressional Commission of the Strategic Posture of the United States, the commission stated: "In addressing the challenges of nuclear security for the decades ahead, the United States must pursue a comprehensive strategy. So long as nuclear dangers remain, it must have a strong deterrent that is effective in meeting its security needs and those of its allies."

The Air Force contributes to effective deterrence by operating, maintaining, securing, and sustaining intercontinental ballistic missiles (ICBMs), dual-role bombers and dual-capable fighter aircraft. Although the numbers of systems are dramatically smaller than at the height of the Cold War, the Air Force provides national leadership with the most responsive, flexible and visible nuclear deterrence capability.

Strategic deterrence is in an airman's DNA; we were born with this mission in 1947. For the past 61 years, we have successfully provided our Nation and our allies diverse and effective nuclear deterrence capabilities. Today, the international security environment is more complex than during the Cold War, with more nations in possession of nuclear weapons and non-state actors in pursuit of weapons of mass destruction.

Our continued ability to provide a safe, secure, reliable, and credible nuclear deterrence capability underpins our national defense, a sober responsibility that the Air Force, with responsibility for two legs of the traditional TRIAD, executes with skill and commitment on a consistent basis.

The Air Force depends on a nuclear enterprise that involves thousands of professionals to include dedicated airmen operating, securing, maintaining and sustaining our operational forces; our partners in the industrial base; the exceptional capability at the national laboratories; and our North Atlantic Treaty Organization partners.

The airmen and civilians involved in the nuclear mission area are uniquely qualified to execute the significant responsibilities associated with nuclear weapons and are known for their discipline, rigor, precision and reliability. Thousands are certified under the Personnel Reliability Program (PRP) and many others have critical duties supporting PRP. All our nuclear units across five different major commands undergo rigorous and unforgiving Nuclear Surety Inspections with necessarily high standards that demand consistent precision and reliability. It's a tough business, but the stakes are too high for it to be any other way

Over this past year, the Air Force made a series of key decisions to address systemic weaknesses in its nuclear mission area. The US Air Force Posture Statement 2009 states: "Through a back-to-basics approach, the Air Force is re-emphasizing accountability, compliance, and precision in the nuclear enterprise. We are reorganizing our nuclear forces in a manner that reduces fragmentation of authority and establishes clear chains of supervision for nuclear sustainment, surety, and operations. These changes include: (1) consolidating all nuclear sustainment matters under the Air Force Nuclear Weapons Center; (2) establishing a new Air Staff nuclear directorate responsible for policy oversight and integration of our nuclear enterprise activities; and (3) standing up Air Force Global Strike Command, which is already operating in a provisional status at an interim location. Global Strike Command will consolidate Air Force ICBMs and nuclear-capable bombers under a single command, and is on track to activate later this year."

The basis for these three key organizational decisions, as well as additional institutional direction can be found in the nuclear roadmap published last fall, "Reinvigorating the Air Force Nuclear Enterprise." The roadmap represents a comprehensive approach to address root causes of documented deficiencies to ensure we are aggressively working to reclaim our legacy of excellence in the nuclear mission area. The roadmap-related efforts well underway in the Air Force to reinvigorate the nuclear enterprise can be categorized into six broad strategic objectives: (1) Develop adequate nuclear-related expertise and properly man the enterprise: right experience, right job; (2) Implement a process for ensuring sustained advocacy, focus, and commitment; (3) Establish clear lines of authority; (4) Implement a disciplined, comprehensive enterprise system-of-systems methodology to ensure day-to-day sustainment excellence; (5) Implement processes to uncover, analyze, address, and review systemic weaknesses; and (6) Sufficiently invest in the nuclear deterrence mission area. By accomplishing these objectives, we will continue to build on the confidence that our Nation and allies have in our commitment to this critical mission.

Our first strategic objective, to improve the professional development of our nuclear experts, is a multi-year effort involving education, training, and the assignment process.

All professional military education courses, both officer and enlisted, have been reviewed and modifications are underway to ensure the appropriate level of content

regarding the nuclear mission area. Additionally, Air Force nuclear doctrine has been updated to include a greater focus on deterrence.

It is vital to assign the best qualified people to key positions. We are aligning our training, education, and career force development with significant work completed by our personnel directorate on the Air Staff in conjunction with the Air Force Personnel Center in San Antonio, TX; truly an ongoing effort that must be continually re-evaluated with the ultimate goal is to ensure the right expertise is matched to the right job. Also, the Air Force has identified billets both inside the AF and across joint and interagency positions that require key nuclear expertise, and these authorizations will be given priority for filling. Additionally, nuclear experience identifiers are being added to personnel records to ensure we are able to track individual experience levels, which aides our efforts to properly develop our people to take on positions of greater responsibility in the future.

We are achieving our second strategic objective—to implement a process for ensuring sustained advocacy, focus, and commitment for the nuclear enterprise—with a series of process changes. The internal AF resourcing process has been changed to now include a new Nuclear Operations Panel, whose role is to ensure a thorough assessment of nuclear funding requirements. The Air Force Strategic Plan, a key planning document to link future capabilities to the programming process, established reinvigorating the nuclear enterprise is the number 1 priority of the Air Force. Additionally, the Secretary of the Air Force and the Chief of staff, at their initiative, established and co-chair the Nuclear Oversight Board, composed principally of the nuclear Major Command Commanders, to ensure proper focus and advocacy is maintained Air Force-wide.

To effectively manage the nuclear enterprise, it is necessary to ensure our third objective is achieved, establishing clear lines of authority. Discussed earlier, these changes include: (1) consolidating all nuclear sustainment matters under the Air Force Nuclear Weapons Center; (2) establishing a new Air Staff nuclear directorate responsible for policy oversight and integration of our nuclear enterprise activities; and (3) standing up Air Force Global Strike Command.

A significant force-wide challenge is encompassed in the fourth objective, implementing a disciplined, comprehensive system-of-systems methodology to ensure day-to-day sustainment excellence. A large component of this effort is being achieved by consolidating our nuclear sustainment activities under the Air Force Nuclear Weapons Center. The Center is working in conjunction with our Air Staff maintenance and logistics experts on a comprehensive positive inventory control methodology and a fusion center for maintaining continuous oversight of nuclear weapons related material.

Critical to our day-to-day excellence in the nuclear mission area is our fifth objective, implementing processes to uncover, analyze, address and review systemic weaknesses throughout the nuclear enterprise. Regardless of the size or structure of our nuclear force, every action by every airman must be executed with precision and reliability. The Air Force is rebuilding a nuclear culture with a robust self-assessment and inspection process in order to effectively uncover, analyze, and address systemic weaknesses within its nuclear enterprise. The Air Force has developed standardized training, qualification, and certification requirements for nuclear inspection team members. Where appropriate, common checklists will be used across all nuclear commands. When significant deficiencies are noted, common root cause analysis techniques are implemented to fix the problem and improve related processes. Today, every AF Nuclear Surety Inspection (NSI) is performed under the oversight of the Air Force Inspection Agency. Also, a core team of inspectors will be attached to each MAJCOM NSI team to ensure consistency across all MAJCOMs. In addition to the increased depth of inspections, "no-advanced-notice" inspections are now occurring across nuclear major commands.

The Air Force has taken aggressive actions to achieve our sixth objective, sufficiently investing in the nuclear deterrence mission area, an area that numerous studies have identified as being significantly under-resourced. Ensuring continued reliability and credibility of our nuclear systems requires a sustained commitment to funding weapons and platforms while simultaneously investing in a credible deterrent capability for the future. We have already programmed resources to address many of the recommendations provided by the various assessments of the nuclear enterprise and continue to focus and prioritize future investments.

Expanding upon our sixth objective, the fiscal year 2010 PB represents significant progress toward addressing many issues and recommendations made by numerous internal and external reviews and investigations. This includes funding and investment to bring all 76 B–52s in our inventory to a common configuration with updated communications and flight systems making all aircraft capable of nuclear and conventional missions. We are revitalizing our intercontinental ballistic missile force,

the Minuteman III, with additional resources for sustainment, aging and surveillance. We have funded improvements to the rural missile complex gravel roads to bring them up to standards which ensure safe transport of our critical systems to and from base, as well as our most precious asset, our airmen, who travel thousands of miles on these roads every day. Other initiatives include the Air Force study of the B61 Life Extension Program that will look at options to extend the service life of the oldest weapon in our inventory. Finally, we are introducing a program to replace our Vietnam-era helicopters for missile field complex security operations with an airframe that will provide required lift capacity, speed and range.

Additionally, with your support, we requested and received permission to reprogram over $100 million to address immediate and achievable needs to the nuclear enterprise in fiscal year 2009. With these funds, we were able to accelerate procurement of armored security vehicles for the missile complexes and weapons storage areas, complete overdue electromagnetic pulse protection work on critical infrastructures, upgrade weapons security systems in Europe, and develop software that will enable our Nuclear Weapons Center to track all Nuclear Weapons Related Material from cradle to grave.

CLOSING

According to the Report of the Secretary of Defense Task Force on DOD Nuclear Weapons Management, "the strategic role of nuclear capability is to deter and dissuade current and emergent enemies from attacking the United States and its vital interests. To be successful in this critical national objective, the Nation's nuclear forces must be demonstrative and credible, and be survivable against a preemptive attack. This combination of capability, credibility, and survivability presents high uncertainty to a potential adversary in attempting to anticipate the success of executing one or more courses of action."

Collectively, all of the actions described above are ultimately focused on deterrence. Strategic deterrence is vital to America's security, and the Air Force is an essential provider of strategic deterrence. Our actions will ensure the Air Force continues to deliver the unique, effective strategic capabilities of stable, flexible and visible nuclear deterrence, thereby instilling confidence in the American people and national leadership; assuring allies; and dissuading and deterring potential adversaries. The Air Force is fully committed to the nuclear deterrence mission.

Thank you for the committee's continued support of the U.S. Air Force.

STATEMENT OF MAJ. GEN. FLOYD L. CARPENTER, USAF, COMMANDER, 8TH AIR FORCE, AIR COMBAT COMMAND

[The prepared statement of Major General Carpenter follows:]

PREPARED STATEMENT BY MAJ. GEN. FLOYD L. CARPENTER, USAF

Chairman Nelson, Ranking Member Vitter, and distinguished members of the subcommittee, thank you for this opportunity to represent the men and women of the Eighth Air Force and to answer your questions regarding the use of bomber aircraft in the United States Air Force. A key component in our Nation's ability to conduct long-range strike missions is found within our Air Force bombers. This unique capability is not possessed by any other branch of our armed services or by any other nation. Globally, the distance of our potential adversaries and lack of basing options hampers our ability to perform in a variety of theaters and scenarios. Long-range strike aviation is one of the few hedges our Nation maintains to mitigate these fundamental challenges. Air Force strategic bombers are a critical element of our National Security Strategy and National Military Strategy, providing unique capabilities to fulfill combatant commanders' mission objectives from shaping and deterring to large scale conventional operations and even nuclear scenarios.

Despite the age of our Nation's three bombers, the Air Force long-range bomber force is unmatched in its ability to provide conventional power for initial response to regional crises within hours. Additionally, our bombers can provide sustained operations in any region of the world employing either conventional or nuclear options. As we move away from forward overseas basing, the speed, range, and payload of today's manned bombers allow for a U.S. presence anywhere on the globe within 24 hours.

The end of the Cold War brought about a false feeling of global security, especially surrounding the long feared use of nuclear weapons between the Cold War superpowers. Shortly after the end of the Cold War we saw the world in its new form—violent and unstable. Different from the last century, non-state actors, specifically

radical fundamentalists, moved to the forefront of the international stage. Our national security debates centered on not only how to counter this threat, but whether insurgent radical fundamentalism is the likely dominant form of warfare for the 21st century. These are critically important questions when deciding the best national military force structure size and composition. But in an effort to "tailor" our force structure we would be remiss if we were to assume this type of warfare will totally dominate the global security horizon for the foreseeable future. For at least the first 25 years of the 21st century, instability, violence, proliferation of weapons of mass destruction, and cultural/religious clashes will be center stage on the global arena. However, we must guard against absolute predictions of what forms of warfare may occur in the future.

As we moved into the 21st century, the 2002 Nuclear Posture Review revealed that the Cold War's Triad was limited in scope and in need of an update. Our deterrence foundation still relies on our strike capability composed of a formidable balance of Intercontinental Ballistic Missiles, Submarine Launched Ballistic Missiles, and manned recallable and retargetable bombers. In today's threat environment where non-state actors and counterinsurgency operations are center stage, the importance of our bomber force to deterrence is often overlooked and little understood. The strategic bomber is unique in its ability to assure allies, shape the environment, dissuade potential adversaries, complicate adversary strategy, provide the President and Secretary of Defense escalation control options, and ultimately offer alternatives to the insertion of precious ground forces on foreign soil.

Unquestionably, there are a myriad of applications for the use of bombers. These include but are not limited to: (1) the demonstration of national resolve through force generation and arming with either conventional or nuclear weapons; (2) upon order, covert, or overt dispersal within the U.S. or deployment to forward locations; (3) strike operations from single-aircraft to multi-aircraft conventional and/or nuclear packages, which, most importantly, can be executed, retargeted, or recalled; and (4) employment of a vast array of weapons to include conventional unguided general purpose bombs, cluster munitions, precision-guided munitions, hard target penetrators, nuclear gravity weapons, and conventional or nuclear cruise missiles. Further, bombers have a unique ability to communicate de-escalation through visible downloading and removal from alert status and/or redeployment to home stations. Overall, and possibly most notable, bombers are differentiable from other strategic nuclear weapon systems—thereby not forcing an enemy into assuming a worst case nuclear scenario.

In the new Strategic Triad, it is the bomber that provides the most flexibility to U.S. command authorities, with this flexibility being multifaceted and unique among the triad components. Air Force bombers are recallable, scalable, directional, and visible and provide our President and Secretary of Defense with both assurance and deterrence at the same time. This deterrence flows not only from the bombers' nuclear strike capability but also from the robust demonstrated conventional capability that can hold any target on the planet at risk. Another unique feature of our bomber force is the ability to deter even while strike operations are being executed. Simply put, deterrence from bombers can continue despite shots being fired. Furthermore, by enabling the effectiveness of other U.S. and partner instruments of power, bomber conventional capability can provide alternatives for deterrence beyond the obvious threat of annihilation. The most illustrative example is U.S. bombers operating in conjunction with indigenous ground forces in Serbia, which ultimately helped facilitate enemy capitulation without large scale North Atlantic Treaty Organization ground force insertion.

To be sure, all components of the Strategic Triad are critical to our National Security Strategy but the bomber force has and will continue to be unique in its ability to assure allies, shape environment, dissuade potential adversaries, complicate adversary planning, provide escalation control, and offer alternatives to our combatant commanders and the President and Secretary of Defense. Bombers are the only platform in the Strategic Triad which can be employed in either conventional or nuclear roles. As our forces continue to redeploy from forward bases around the world, long-range strike aviation will remain one of our Nation's key power projection capabilities in the foreseeable future. This long-range strike capability provides the Nation the most powerful means to rapidly respond or attack around the globe and offers our Nation's leaders freedom of choices and freedom of action in the new world environment. Our national security will increasingly depend on strategic bombers to meet the demands of responding rapidly and decisively to security threats. Thank you for this opportunity. I look forward to your questions.

STATEMENT OF RADM STEPHEN E. JOHNSON, USN, DIRECTOR, STRATEGIC SYSTEMS PROGRAMS

[The prepared statement of Rear Admiral Johnson follows:]

PREPARED STATEMENT BY RADM STEPHEN JOHNSON, USN

Chairman Nelson, Senator Vitter, distinguished members of the Strategic Forces Subcommittee. Thank you for this opportunity to appear before you to discuss our Navy's nuclear enterprise, today's force and the efforts to ensure the continued reliability of our submarine strategic forces, and the *Ohio* class replacement to maintain continuous strategic deterrence.

NAVY NUCLEAR ENTERPRISE

The Navy remains vigilant in executing our nuclear strategic deterrent mission. The Department of Defense nuclear enterprise has gone through several important events over the last year. Through numerous reviews, both internal and external, the Navy has been found satisfactory in executing our responsibilities although there are areas where improvement is required. These efforts included an in-depth review of nuclear weapon custody and accountability procedures, weapons handling procedures, training, and flight test non-nuclear verification requirements. These reviews have confirmed the Navy has maintained a safe and secure environment for our strategic assets As a result of these reviews, the Navy has established two new three Star level councils chaired by the Director Navy Staff to provide central coordination to focus and address policy, operational and acquisition issues associated with our nuclear weapons enterprise, and ensure the Chief of Naval Operations (CNO) receives comprehensive recommendations for nuclear weapons governance. The first council involves the three Star Admirals on the CNO's direct staff and is called the Operational Navy Nuclear Weapons Council. The second brings together the Operational Navy leadership, the Fleet leadership, and acquisition leadership and is called the Navy Nuclear Weapons Senior Leadership Oversight Council. These new councils demonstrate the Navy leadership's continued focus and commitment to this mission area.

I have focused Strategic Systems Programs on six major areas to continue to sustain high standards which include: (1) rigor; (2) field activity oversight; (3) self-assessment; (4) corrective action; (5) material management; and (6) personnel. These six areas of focus form the guiding principles by which we will manage our day to day operations and set the culture to sustain this mission for the long term. The men and women of Strategic Systems Programs and our industry partners remain dedicated to implement these guiding principles to meet the mission of our sailors on strategic deterrent patrol and our marines and sailors who are standing the watch to ensure the security of the weapons we are entrusted with by this Nation.

TODAY'S FORCE

Our 14 Trident Submarines, eight of which are homeported in the Pacific and 6 in the Atlantic fleet, continue to provide a credible, survivable, and reliable sea-based strategic deterrent for our national leadership. Two of our submarines, USS *Nevada* (SSBN 733) and USS *Tennessee* (SSBN 734) are undergoing Engineering Refueling Overhauls which will maintain the viability of these platforms through the end of the class. USS *Alaska* (SSBN 732) has recently completed her overhaul and post availability testing and is preparing for her Demonstration and Shakedown Operation with a Replacement strategic outload and return to the operational cycle next spring.

The men and women of Strategic Systems Programs (SSP) are committed to maintaining the high reliability of our 14 *Ohio* class SSBNs with their Trident II D5 Missiles, as well as the four *Ohio* class SSGNs that have been converted to carry *Tomahawk* missiles and support Special Operating Forces (SOF) missions as directed by our combatant commanders. In February the USS *Alabama* (SSBN 731) conducted the 126th consecutive successful flight test of the Trident D5 missile as part of her Demonstration and Shakedown Operation. This record of successful flight tests is unmatched by any previous missile launch system. Therefore, I am pleased to report to you that the Trident Strategic Weapons Systems continues to meet the operational requirements established for the system almost 30 years ago. However, it is my military opinion that the overall health of the D5 weapons systems is not without cause for pause, as the weapon system is nearing its 20th year of deployment and now enters an era of its lifecycle where age-related issues may impact its reliability. With D5 planned for operational deployment to match the *Ohio* class hull

life extension, D5 hardware will age beyond our previous experience base and will be operational almost twice as long as any previous sea-based strategic deterrent. Age related concerns have been validated by several technical issues that have arisen over the past year that remind us that the Trident weapons system requires increased vigilance to maintain the demonstrated high reliability of the system. I am confident that the dedicated SSP team is up to this challenge.

D5 LIFE EXTENSION PROGRAM

Our efforts to extend the life of the Trident II D5 missile continue. We are procuring additional missiles, due to the *Ohio* class hull life extension, to ensure that our *Ohio* class submarines are fully out loaded throughout their service life. This is being accomplished through continuous production of critical components such as rocket motors, major requalification efforts when necessary, and an update to missile electronics and guidance packages to address obsolescence. However, even with continuous production of solid rocket motors, we are experiencing cost challenges today as both NASA and Air Force demand declines and will continue to experience those cost increases as demand continues to shrink in future years. We are approaching the Critical Design Review for our missile electronics update and are evaluating various options to determine the most cost effective implementation into the fleet. These updated electronic packages form a large part of the life extension strategy which supports the deployment of the Trident II D5 weapons systems on the *Ohio* class submarine and its impending replacement program.

Key to the success of the Trident II, D5 Life Extension is the life extension of the W76, Mk4 warhead refurbishment known as the W76–1 which we are executing in partnership with the Department of Energy. This program is on track to provide the Navy with the weapons we need to meet operational requirements throughout the *Ohio* class deployment and the planned follow-on platform.

NUCLEAR WEAPONS SECURITY

As technical program manager responsible for the Navy's Nuclear Weapons Security, SSP has actively pursued technologies which will provide credible, cost effective security for the nuclear assets entrusted to our watch. Our Marines and Navy Master-at-Arms are providing an effective and integrated elite security force at both of our strategic weapons facilities. We have begun construction of our Limited Area Production and Support Complex at Strategic Weapons Facility Pacific, Bangor, WA. When complete, this facility will provide a higher degree of security for our ashore operations.

The United States Coast Guard, Maritime Protection Force Units have been commissioned at Kings Bay, GA, and Bangor, WA. These Coast Guardsmen and the Navy vessels they man provide a security umbrella for our *Ohio* class submarines as they deploy and return from their deterrent patrols. They form the basis of our Trident Transit Protection System.

OHIO CLASS REPLACEMENT

In 2027, the Navy will retire the oldest of the 14 *Ohio*-class SSBNs when it reaches the end of its service life. Over the subsequent 13 years the Navy will retire the remaining *Ohio*-class SSBNs at a rate of approximately one per year. The *Ohio* class replacement is the replacement capability for the *Ohio* class ballistic missile submarine. It will be a strategic national asset whose endurance and stealth will enable the Navy to provide continuous uninterrupted survivable sea-based strategic deterrence. Appropriate investment in the *Ohio* class replacement research and development and concept development is essential to a reliable, survivable and adaptable sea-based strategic deterrent prepared to face an uncertain future. The Analysis of Alternatives study commenced on 13 Aug 2008 and will complete this summer. The Navy's fiscal year 2010 budget provides the required RDT&E investment to support the lead ship construction.

The U.S. will maintain its strong strategic relationship with the U.K. for follow-on platforms, based upon the Polaris Sales Agreement of 1963 and recently reinforced by the Presidential, Prime Minster and Secretary of Defense exchange of letters. The U.K. has provided funding in 2008 and 2009 to support the design and development of a Common Missile Compartment that supports both the *Ohio* class replacement and the successor to the U.K. Vanguard class.

SSGN

Although SSGN is not a strategic asset, the program synergizes off of the Trident system. This highly successful program, authorized by Congress as a method to

maintain the viability of four *Ohio* class submarines and bring a major advance in tactical submarine overseas presence is almost complete. All four of these submarines have completed their conversion to SSGN Attack and SOF Platforms. USS *Ohio* (SSGN 726) completed a highly successful 14 month forward deployed period, USS *Florida* (SSGN 728) just returned from her deployment in 5th Fleet, USS *Michigan* (SSGN 727) is forward deployed in 7th Fleet, and USS *Georgia* (SSGN 729) will depart on her maiden deployment later this year. By any measure, these platforms have delivered on the promise to provide high volume strike and high capacity SOFs capability to our combatant commanders. I am in the process of turning over the day-to-day maintenance operations and future spiral development efforts of these fine ships to the Naval Sea System Command In-Service Submarine Organization as these platforms are no longer considered part of the Nation's Strategic Forces.

Mr. Chairman and distinguished members of this subcommittee, I sincerely appreciate your continued support of the Navy's nuclear enterprise. Your efforts will ensure the continued credibility and reliability of our Trident II Weapons System and its remarkable Trident II D5 Missile, maintaining an unmatched record of success by any missile system. The men and women of Strategic Systems Programs are committed to the highest standards of safety, surety, and reliability of this remarkable system. Thank you again for the opportunity to appear before you today and am prepared to answer any questions you may have.

Senator BILL NELSON. Mr. D'Agostino, there's an article in the New York Times and in a bunch of other papers about the publication of the Government Printing Office (GPO) Web site of a report that, according to the article, "gives detailed information about hundreds of the Nation's civilian nuclear sites and programs, including maps showing the precise location of stockpiles of fuel for nuclear weapons." I understand that they've taken this report down from the Web site.

Tell us about this, and tell us your assessment of any vulnerability that was disclosed in the report.

Mr. D'AGOSTINO. Mr. Chairman, I'd be glad to.

First of all, the report that you mentioned is the United States declaration associated with the additional protocol, which is a more rigorous inspection regime set up to assist in our nonproliferation efforts around the world. In fact, it's not a report about our nuclear weapons activities or sites, specific locations of nuclear weapons or nuclear security; it's civil nuclear materials that exist around the United States. It is a sensitive, but unclassified, report. Ultimately, it would have gone after 60 days here in Congress, it would go over to the International Atomic Energy Agency. We think the report's a great demonstration of U.S. leadership and wanting to be upfront, wanting to be the first one to get on to these more rigorous inspections. We're certainly dismayed that the sensitive information was displayed publicly, but I can assure you, sir, I've looked at the actual report—in fact, this morning again—to make sure that I was very clear, particularly at sites that are the responsibility of my organization, to make sure that the information there is all unclassified. It went through a detailed interagency review. So, while I'm dismayed that it's out, I can assure you, sir, that it doesn't release weapons information.

Senator BILL NELSON. So, it's just an easy locator for where nuclear weapons complexes are.

Mr. D'AGOSTINO. It's an easy locator for the civil side of what I would say the research and development that the Nuclear Energy Program does in the Department of Energy (DOE); some of that work is done at the NNSA site, some of it is done at the laboratories. There is some commercial power plant information that's

out there. But, it does not reveal any classified information. Unfortunately, it's a nice compilation of information dealing with civil nuclear, and we are always very sensitive—and the Nuclear Regulatory Commission is, as well, very sensitive—to how much information gets out there that doesn't necessarily need to be out there. Unfortunately, this is one of those cases.

The real concern, I think, has to do with, how did this information get out onto the GPO Web site, and that's something I'm sure we'll be working very closely with Congress on, trying to figure that out.

Senator BILL NELSON. Do you have any idea how this would have appeared in the paper? Did they just cobble together a bunch of unclassified information?

Mr. D'AGOSTINO. I think what probably happened is, this sensitive, but unclassified, report that was sent was inadvertently placed on the GPO Web site. Another group—I believe it was the Federation of American Scientists—picked that up and placed it on their Web site, and from there it spilled into the media. It has since, as I understand it, been taken off of the GPO Web site. It's all unclassified information, but it's sensitive. It details where the country is doing some of its civilian research in nuclear areas, so it has information about materials and things like that.

Senator BILL NELSON. Do we have to worry about any enhanced security, or do you feel like the security is adequate?

Mr. D'AGOSTINO. I'm very comfortable with the security at our NNSA sites. Those are the ones I know about the most. We design our security posture fairly rigorously against—the details, of course, are classified—a pretty broad set of threats. It would certainly cover the potential threats that might be here.

We don't want to make things easier for people. I think, unfortunately, something like this does make some things easier. It just means that we have to maintain our security posture and keep it strong and continue to check on how we're doing, per our own standards.

So, I'm very comfortable with the security of our NNSA sites, even with this report out, because I've looked at the "maps," if you will, and there's—on all of our sites—really nothing there, quite frankly. It just shows a corridor, for example, in a building, nothing else around it, so you have no idea of those kinds of details.

Senator BILL NELSON. The Nuclear Posture Review (NPR) is underway, and each of you have a role in the process. So, why don't we start with you, Admiral, and you all just go right down the line and tell us about your role in the process.

Admiral JOHNSON. Yes, sir. The Navy assigns a flag officer to each of the working groups for the NPR. I am assigned, appropriately, to the Stockpile and Infrastructure Working Group, and I support Mr. Henry and Dr. Harvey, who are the chairmen of that group. Then, the Strategic Systems Programs has key individuals supporting all parts of the NPR. We meet weekly. In my opinion, it's good communication, it's a good, healthy process, and I expect a good outcome.

Senator BILL NELSON. Okay. Now, you said you're assigned and that you meet weekly. What's your role in the process?

Admiral JOHNSON. I provide the answers to postulated scenarios provided by the other groups primarily who are the force structure groups. In the case of change in weapons loading, we would analyze: where would we store weapons; how many would have to be moved; how long would it take; what would it cost; et cetera. Those sort of practical answers. In the group that I'm in, we also help illuminate the investments necessary within the infrastructure for the Stockpile Stewardship Program and for it to carry on into the future.

General CARPENTER. Sir, like the Admiral, I have no real direct role, other than as a technical advisor, if you will, or a subject matter expert on the bomber side, since 8th Air Force is the nuclear bomber leg, which we consider a critical part of the triad. I act as an advisor when there are questions about that particular part of the triad, and how many weapons would be appropriate for that part of the triad. So, I'm removed, at Barksdale Air Force Base, from the NPR process itself, but very much engaged, through STRATCOM and through the air staff, with General Alston.

Senator BILL NELSON. Do you get involved in the design of the new bomber?

General CARPENTER. No, sir, I have not.

Senator BILL NELSON. How about you, Admiral? With regard to the new submarine?

Admiral JOHNSON. Yes, sir.

Senator BILL NELSON. You get involved in the design?

Admiral JOHNSON. Yes, sir. I have been responsible, on the Navy side, for all the pre-milestone work, the system-engineering work that preceded the start of the analysis of alternatives, and I will be responsible for the design and the operation of the missile compartment.

Senator BILL NELSON. General?

General ALSTON. Mr. Chairman, I am responsible for the Air Force support to the NPR process, so I ensure that we have proper representation on all of the working groups that are working the NPR. Admiral Johnson and I have found ourselves, in my 21 months, together very often, because of our somewhat common responsibilities, and we also share seats in some of the NPR forums. But, my responsibility would be not only to ensure that we have active engagement at every level within the NPR, but that I ensure that, as discussions and propositions and excursions would develop, that whatever would be asked of the Air Force, in terms of replies, that I would help manage those replies to that process.

I, too, agree that this has been a very collaborative process. I think it's been a very transparent process. It is bona fide that the Services have been invited to participate fully. I'm very encouraged that, with this level of collaboration and a focus on strategy and policy-leading force structure, that I, too, am confident that we will get a very competent outcome for the Nation.

Senator BILL NELSON. Mr. D'Agostino?

Mr. D'AGOSTINO. Yes, Mr. Chairman. I'm a member of the Senior Integration Steering Group (SISG). We meet weekly. Essentially, there are a series of working groups—the Stockpile and Infrastructure Working Group, as you heard Admiral Johnson describe, Policy Working Group, Force Structure Working Group, an Inter-

national Working Group. We have this organization above that worries about the interagency coordination between these detailed working groups. So, I sit on that group. We do tradeoffs. We make sure that the strategy force structure feeds the number of warheads, types of warheads, and then do the iteration back and forth and make sure all these pieces tie together. Then, occasionally I've sat in as acting for the Deputy Secretary in deputies' committee meetings at the National Security Council (NSC) to be on the receiving side of some of this. I would agree with General Alston, I've seen a tremendous level of collaboration, not only between the Services and OSD policy, acquisition technology, and logistics, but State Department and international partners, as well. So, it's been a great process.

Senator BILL NELSON. Jeff, do you want to ask any questions at this point?

Senator SESSIONS. You can go ahead.

Senator BILL NELSON. All right. Mr. D'Agostino, you know that there is a reasonable chance that we're going to reduce the nuclear stockpile. That's going to increase the size of the backlog of the nuclear weapons waiting to be dismantled. How would NNSA handle that increased number of dismantlements?

Mr. D'AGOSTINO. Absolutely right, sir, we do expect some increase in our dismantlement queue. As I've mentioned publicly before, we have a pretty sizable dismantlement queue. The actual number is classified, but at the pace that we're on, we'll take apart our last warhead in that dismantlement queue in 2022. That actually is a fairly accelerated rate from where we were about 4 years ago, on the pace that we were on. Our plan—we submitted a report last year with the classified details to Congress, and every 2 years we'll re-up that report. The way we would handle the increased rate is to continue to use what we call a special tool set. It's what we call "Seamless Safety for the 21st Century." It's a series of special tools that assist us in working on our warheads, where we don't have to move the warhead around so much, but it sits in a special toolcase where it allows us to take it apart fairly rapidly. But, most importantly, more important than speed, is the safety piece of this. Many of these warheads, particularly these old warheads, were built 40-plus years ago of fairly exotic materials, and have been in very hot silos and up in cold airplanes and back and forth. It's a very complicated job. So, my primary concern is not if I can take them apart faster every single year, but can I continue on the safety record that we've held essentially since the program started, because we're dealing with conventional high explosives that don't have the safety—on old systems that don't have the safety features of our more modern systems.

So, I can assure you, safety is number one, not how fast I can do them. Clearly it's going to require us to maintain a good set of production technicians who are trained in this area. I think we have that crew in place right now.

What I don't want to do is hire up essentially 300 people, because it's going to take me a few years to get them trained up—have them work really hard for 6 years to take everything apart, and then have to lay them off, because it doesn't make sense economically.

Senator BILL NELSON. Do you have enough pit storage at Pantex?

Mr. D'AGOSTINO. Yes, sir, right now, our expectation is that we will be able to handle our expected future pit capacity not only today on our current plans, but the expectations of the NPR. I don't want to be predisposed that I know the answer before the review is done, and I don't. But, we're going to reevaluate all of these questions on storage facility locations as soon as we get the exact numbers. So, I'm anxiously waiting, frankly, to get this review done, get the details out, because that assists me greatly in my 5-year planning.

Senator BILL NELSON. Why did you move the responsibility for the construction of the pit disassembly facility from one office to another?

Mr. D'AGOSTINO. In many cases, the pit disassembly and conversion facility move was directed by Congress, so we had a shift. I'm never a big fan of moving large projects from one to the other, because what you do is, you disrupt teams. These are very complicated facilities. They require a certain set of consistency over years of time. Both of those organizations are in the NNSA, so I am ultimately responsible for it and ultimately that's going to be my objective.

Senator BILL NELSON. In disassembling the nuclear weapons, do you want to do some of that in Nevada or do you want to do all that at Pantex?

Mr. D'AGOSTINO. I want to do that at Pantex, because first of all, my production technicians are at Pantex. Next, the facilities that I have at Pantex are actually certified by ourselves and checked by the Defense Nuclear Facility Safety Board to be able to do what I would call the highest level of nuclear safety work, because safety is primarily number one. If we're ever in a situation where we have, I would say, a problem disassembling a particular warhead, for example, because it's just been together for so long and we are in a situation where we need to get it out of the system because it's stopping a lot of other disassembly work from happening, we do have the option, and it will be on a case-by-case basis, to say, "Let's use our device assembly facility at the Nevada Test Site, fly some technicians out there, do this specialty work on this particular warhead while we continue to work away this larger bucket of dismantlement work."

So, Nevada is always a nice contingency plan for us. I don't see anything in the near future that would cause us to use it right now.

Senator BILL NELSON. Senator Sessions?

Senator SESSIONS. Thank you.

Mr. D'Agostino, when we talk about nuclear stockpile reductions, which will be part of the President's talks with the Russians—have they already begun?

Mr. D'AGOSTINO. The Assistant Secretary, Rose Gottemoeller, from the State Department, has started working with the Russians. Yes, sir, she has.

Senator SESSIONS. It's on a fast track. I would just note that there's no reason that that has to be done this year. It's a self-imposed goal. We can extend the Strategic Arms Reduction Treaty

(START) for up to 5 years with little problem. But, at any rate, the President seemed to be determined to move forward with that, and announced some reductions. But, the question I think we're hearing from various experts in the field, that any reduction done by current stockpile should be tied to some sort of modernization plan of our existing nuclear weapons. Do you share that view?

Mr. D'AGOSTINO. I think that's a discussion that I'm currently having right now. One statement I would make is, I feel very strongly that we are in a fragile position, if you will, from an infrastructure and people standpoint. There's a Perry-Schlesinger report that has come out recently that has a fairly accurate portrayal of the infrastructure and people concerns that they have. One thing to do is make—we have great people in our outfit. The people want to know that they're doing work that the country cares about and that they're doing work that exercises their skills. So, an element of that is extending the life of the warhead. The way that Perry-Schlesinger Commission report describes life extension is a continuum of activities, from refurbishment to replacement. I think working in that continuum is where we're going to end up and what the NPR is going to end up showing us.

So, all of these pieces are tied together. In my view, you can't just talk about one piece, just talk about size only, and not address, frankly, the whole integrated situation, not only on the NNSA side, but my colleagues in DOD who also have concerns with critical skills.

Senator SESSIONS. Former Secretary Perry, on May 28—who's been, frankly, very aggressive, more than I would suggest, is required to draw our weapons systems down—said this in his article: "The U.S. should maintain a safe, secure, and reliable nuclear deterrent for itself and its allies, and that this deterrent should be adequately funded and staffed with topnotch managers, scientists, and engineers." I know that you are challenged with making sure that there's no waste, every dollar is spent wisely. But, is the budget before us today that's been proposed, is that sufficient to meet the standards that Secretary Perry made?

Mr. D'AGOSTINO. The budget we have before us today meets the standard for today, for the year that we're talking about, 2010. I would like to note, though, that particularly when one looks at the out-year plan—typically we submit a 5-year series of numbers to show direction, if you will, on our programs. This program, you'll note that our out-year numbers are exactly, in some cases, in science and technology, fairly identical with the 2010 number. That is done because I recognize that changes are going to have to be made in the out-years in order to make Mr. Perry's statement a sustainable and true statement out in the out-years.

So, the way I would describe this is as a 1-year budget submittal to Congress, that once the NPR comes out, my plan, Tom D'Agostino's plan, is to make sure that the challenges of securing nuclear materials in 4 years, the challenges associated, as the Perry-Schlesinger report puts out, on doing life extensions on our warhead and exercising our people, are duly reflected in the science element of my program, the infrastructure element of my program—not "my program," but the program that the country has en-

trusted me with for now, as well as the direct stockpile work piece, the life-extension piece.

Senator SESSIONS. Is there money in it sufficient to do those things in the out-years?

Mr. D'AGOSTINO. Not in the out-years, but in 2010, yes, sir.

Senator SESSIONS. Secretary of Defense Gates, just last October, said, "The U.S. is experiencing serious brain drain in the loss of veteran nuclear weapons designers and technicians." He went on to say, "To be blunt, there is absolutely no way we can maintain a credible deterrent and reduce the number of weapons in our stockpile without either resorting to testing our stockpile or pursuing a modernization program." Do you agree with that?

Mr. D'AGOSTINO. I largely agree with that statement. There's details below some of those statements. A modernization effort, in my view, encompasses a wide variety of activities, from reuse of components that we've previously made, exercising our scientists, to making sure that when we do a life extension on our program, we modernize the safety and security elements of our warheads. That's absolutely important. The last thing I think is—as we maintain our deterrent, put warheads into our stockpile that are based on 1970s- or 1980s-era safety and security efforts, because we know that things have changed in the last 30 years.

Senator SESSIONS. A modernization program should result into weapons being more reliable and significantly more safe, should they not?

Mr. D'AGOSTINO. Absolutely, Senator. I agree 100 percent with that statement.

Senator SESSIONS. What objections are you getting to modernizing, even as we draw down some of the numbers?

Mr. D'AGOSTINO. I think making sure that it's put in the context of the President's overall strategic direction, making sure that it fits in. We have an integrated framework to talk about nuclear security.

Senator SESSIONS. Yet, you don't have a commitment for funding that would allow you to do that. Is that what you're saying?

Mr. D'AGOSTINO. The program I have right now puts us in a position to be able to respond to the NPR. I'm very confident—and that's why I'm very excited about being able to get a NPR out, because we want that detail and that information in there. That's why Dr. Harvey, who is co-leading the stockpile and infrastructure group, understands this program, has my views—is working that in the NPR process, because I have these views that I want to be reflected in, ultimately, the administration's position for the future.

So, I have no objection to modernization. I think it's important. We need to put safety and security into our stockpile. We have some in already. We want to make sure that, if we're going to extend the lives and maintain our deterrent, that continues out into the future.

Senator SESSIONS. You also would acknowledge that we're the only nuclear weapons country in the world that doesn't have a modernization ongoing program. Is that right?

Mr. D'AGOSTINO. That's correct, but we do have a life extension program. I want to make sure that that's clear. Some of this is not semantics—there are some details behind the difference between a

pure refurbishment life extension and a reuse life extension or a replacement life extension activity. So, it's absolutely correct, if we're talking about what I would call advancing the ball dramatically on safety, security, and reliability. But, we do have a life extension program underway; in fact, we're supporting the Navy, Admiral Johnson's requirements, for the W–76 warhead, in that respect.

Senator SESSIONS. We just need to do what is necessary to move forward with these programs. I just am not seeing a firm commitment from the administration that that's what's going to happen. We hear some positive talk. I think you guys hope that the NPR will help move us in that direction, but I haven't seen it yet, and it makes me somewhat nervous.

Admiral Johnson, tell us briefly about missile defense, about your requirements to test submarine-launched missiles, how often do you launch those, how many you do, and why you think that's necessary to guarantee the reliability of those systems.

Admiral JOHNSON. Yes, sir. The Navy tests four missiles per year in a program we call a Follow-on Commander's Evaluation Test. The submarines are on patrol. They are notified. They're selected at random. They're notified by message. They return to port. Two missiles are selected—again, randomly. Those missiles are then—the warheads are removed, and the appropriate test instrumentation, telemetry, and destruct capability are installed. It takes a couple of days, a matter of days, and the ship proceeds to the range area and conducts normally two missiles from that submarine. We do that twice a year, a total of four.

Senator BILL NELSON. Tell us where that range is, Admiral.

Admiral JOHNSON. There are two ranges. The one we used yesterday is off the coast of Florida. It's the same operation center the Air Force runs for a variety of tests. They share that facility with us at the 45th Space Wing, and it's the eastern range. We fired, in this case, from Her Majesty's ship, Victorious, a Royal Navy submarine fired off the coast of Florida for a 5,000-mile test splashing down off the coast of Africa.

Senator SESSIONS. Mr. Chairman, I think, one thing we will need to look at is that the national missile defense—they reduced the number to 30. If that goes forward, which I'm not comfortable with, I think it puts an even greater requirement that we have enough missiles that we have tested over the years, because all of our other areas test. You've been a critic, I know, for some time, and then—that we haven't probably tested that system enough. So, however we come out with national missile defense, I think we're going to have to produce those things while the assembly line is hot so they can be used for testing.

Thank you. I appreciate your leadership. You are exceedingly knowledgeable on all these issues, and I'm pleased that you're chairing our committee.

Senator BILL NELSON. Just for you students, here, this is the famous Senator whose picture is on the front page of the Washington Post this morning. [Laughter.]

Mr. D'Agostino, we're not only reducing the number of nuclear warheads, but we're going to reduce the actual types of nuclear

warheads. So, how do you go about reducing the weapons types and reducing redundant warheads?

Mr. D'AGOSTINO. What I would say now is, there is discussion about reducing types, but that will be left for the NPR ultimately to come out. But, I would offer the following, if I could. Ultimately, it gets driven by DOD's requirements, the types of targets that are part of the algorithm that determines the size of the stockpile, whether or not certain targets can be covered by multiple warheads, are there backups needed. From my standpoint, reducing the numbers of types makes the maintenance element a lot easier. I don't have to make X number of different types of neutron generators or thermal batteries or other particular components that we have to replace on a periodic basis. So, the maintenance piece becomes easier. There's a downside, of course, to reducing the types, and that is, you become more and more dependent on the types you have remaining. Therefore, that drives you to want to make doubly sure or triply sure that you know exactly what's going on with those particular warheads you've decided you're going to retain in your arsenal, both in numbers and types. So, I've always emphasized the point that as—if our stockpile gets smaller, and if the numbers of types go down, that more and more reinforces the need to have this discussion on having a very sustainable workforce and infrastructure that does that. Right now, we don't have that in the out-years, in my opinion, but that's what we have to get to.

General Chilton ultimately can provide a more fullsome answer, sir, to your question on reducing the types.

Senator BILL NELSON. Okay. We'll take that up with him.

Historically, each lab has been responsible for the weapons that it designed. What do you think of the idea of having all the data on all of the weapons available to each of the laboratories and having each lab do an independent review of each weapon?

Mr. D'AGOSTINO. I like that idea, sir. I think it's a great idea. We discussed, last year, on how we make our annual assessment process stronger as our stockpile size changes. We believe we've reached that point where our stockpile size is small enough that we need two independent checks, full sets of experiments run independently by both labs, keeping the responsibility, of course, for the design with one laboratory, because we always want one organization responsible. But, having another institution do that—Secretary Chu has looked at this idea. In his first month or so as the Secretary, I talked to him about that. He was convinced enough that he signed out, essentially, a piece of paper that directed us to go off and establish the system where we work that in. It means a little bit more science work, it means a few more experiments, it means a bit more analysis, and it means a bit more back and forth between our two laboratories, but that's a good thing. I think the country will be better off because of that.

Senator BILL NELSON. Senator Sessions?

Senator SESSIONS. Just briefly. The Wall Street Journal, on June 2, has an article that the U.S. and Russia talks appear headed for a framework agreement by July 6, and a final treaty by December. That's moving right along.

Mr. D'AGOSTINO. I would agree with that, sir.

Senator SESSIONS. Have you been involved in that?

Mr. D'AGOSTINO. Yes, sir, at what we call the interagency meetings we have at the NSC and advising the Assistant Secretary of State—that is the prime negotiator for the administration.

Senator SESSIONS. Mr. Daryl G. Kimball, Executive Director of the Arms Control Association here in Washington, which is a private group, I think, that apparently knows a lot about it, described the atmosphere at these meetings, usually tedious, as "electric." White House officials wouldn't say what their targets are on a treaty with Russia, but Mr. Kimball said the deployed nuclear weapons in each country could be reduced by 30 percent to 40 percent from their current limit of 2,200 warhead delivery systems, Admiral Johnson, would be cut by half. General Alston and team, let me ask the military witnesses whether they've conducted any analysis on the implications of these reductions for their leg of the triad.

Who wants to start?

General ALSTON. Senator, I'd be happy to start.

The process so far with regard to the NPR has been looking at the existing treaty limits with regard to Moscow and the combatant commander has been involved in his assessment as to force levels, but the discussions have not gotten so specific yet as to identify specific force levels. It has been a priority, certainly of the Air Force, and I will let Admiral Johnson speak for his service, but that we are ensuring that our responsibilities to maintain nuclear surety at lower levels is a very important matter to us. You would have, in your workforce, their ability to perform their roles and responsibilities. It's a sensitivity that we have. As we get deeper into this discussion and deeper into the NPR, I know we're going to reach a point where we're going to have to be able to make the assessments that you indicate we will need to make.

Senator SESSIONS. But, you haven't been asked to, and have not completed an assessment to reduce your delivery systems by one-half?

General ALSTON. No, sir, we have not. There have been some excursions to see what would be the art of the possible, but I really would not qualify those as reaching the point where they would be sufficiently mature for force-structure recommendations. But, for half of the force, no, sir, there hasn't been that level of detailed discussion involved in the Air Force.

Senator SESSIONS. General Carpenter?

General CARPENTER. I agree with everything General Alston said. Our position basically has been that we have been promoting a balanced triad, whatever the numbers are, that the end result should end with a triad, as we have today, that is a balanced triad, so that every leg has a sufficient number of weapons to make it sustainable.

Senator SESSIONS. Admiral Johnson?

Admiral JOHNSON. Yes, sir, I agree with the same position. I do make the observation that, in the case of the missile tube numbers, the current numbers are set higher than the number of missile tubes that we have today, and that may provide some insight into the way—I haven't read the article, so I can't exactly respond to it.

Senator SESSIONS. They just speculated. They talked about delivery systems being reduced by half. Let me ask you—you're aware—

and I know when you've been promoted and had hearings, you've been asked whether or not you would give your honest assessment, regardless of what the politicians tell you, so I'm going to ask each one of you three uniformed personnel, will you, if asked about whether or not you can accept a 50 percent reduction in the delivery systems of our triad, will you give your best military judgment?

General ALSTON. Yes, sir.

General CARPENTER. Yes, sir.

Admiral JOHNSON. Yes, sir.

Senator SESSIONS. All three of you said "Yes." I appreciate that.

Also, Secretary D'Agostino, on the question of nuclear weapons, the numbers slip my mind right now; perhaps you can recall how many tactical nuclear weapons the Russians have and how many we have.

Mr. D'AGOSTINO. The actual numbers are classified, but I will say there's a 10-to-1 ratio, roughly, give or take. It's a big difference between the two.

Senator SESSIONS. If the START goes forward, we're talking about the strategic nuclear weapons primarily being reduced, and there's no plan to narrow the gap in the tactical nuclear weapons, is there?

Mr. D'AGOSTINO. The administration is focused—you described the timeframe earlier, which is correct, sir. Addressing the tacticals would be very difficult to do in the time period. There's other implications. Russia's been very coy about the role of their tactical nuclear weapons, vis-a-vis their overall national defense. It's a different approach than what we have.

Senator SESSIONS. Oh, I see. The Russians don't want to talk about it? That's right, the Russians don't want to talk about tactical nuclear weapons. That's off the table. They're willing to talk about strategic nuclear weapons, and that's the fact of the matter. The administration is determined to reach this treaty, for reasons that baffle me. Hopefully we can go in that direction and move forward in that direction. I'm supportive of that. But, we're not under any pressure to do this. This is a self-imposed pressure that worries me. So, these are important issues. I know you will work on them, and give your best judgment.

Mr. Chairman, thank you.

Senator BILL NELSON. Thank you, Senator Sessions.

Originally, under START II, there was a general understanding that once we got to START III, they would take up the tactical nuclear weapons, but we never got around to ratifying START II. So, this is something you have brought up in a most timely fashion, and I thank you for bringing it up. We need to keep it out there on the table and ultimately get to that issue.

The idea was to address the strategic weapons first and then get to the tactical. Well, we never got there. So, thank you, Senator Sessions.

Senator SESSIONS. Thank you.

Senator BILL NELSON. Senator Vitter?

Senator VITTER. Thank you, Mr. Chairman.

Welcome, to all of you. In particular, General Carpenter, welcome to you, and thanks for your new leadership of the Mighty 8th in Louisiana. We're very proud of that.

My first question goes to something focused there, which is of the Air Force's movement on Global Strike Command, which is slated for Barksdale and obviously we hope that moves along and continues, in terms of the new major command that is clearly a significant high national priority, and it's a national priority to stand it up in a timely way. Can you give us a view—and/or, General Alston—an update on how that's progressing?

General CARPENTER. I can give you a timeline, and General Alston can fill in any gaps I missed.

June 27 is the end of the environmental assessment period. Assuming that all comes out as we hope, then it will be announced as the final location. Once that happens, then you will start seeing people and resources being moved there. General Kowalski, who's the vice commander now of Global Strike Command, I believe is scheduled to arrive the first week and a half of July, followed by General Klotz, the new commander, and he is to arrive by early August. We're going to have a standup of the command, an activation of the command, and I believe August 7 is the planned date right now, tentatively at least. I think you know that the initial operating capability is scheduled for September. Come December of this year, the Intercontinental Ballistic Missile (ICBM) wings move over to Global Strike Command out of Space Command, and then followed, in February 2010, the bomber units will be moved from Air Combat Command into Global Strike Command, with, finally, full operating capability in September 2010. So, that's the schedule as I know it today.

Senator VITTER. Thank you very much, and thanks for your leadership in that important transition. Again, thanks for your leadership of the Mighty 8th and your being part of our military community in Louisiana. We're very proud to have you.

General CARPENTER. Thank you.

Senator VITTER. Gentlemen, I share many of Senator Sessions' concerns about some of this work toward treaties with regard to START. I can support the concept, and I can support the goal, I just want to make sure we do it right and don't set deadlines or timetables or goals with PR in mind, versus substance, and basically put politics and PR ahead of substance.

With respect to that, I'm concerned about this schedule of trying to get to a new START in December, when the current NPR isn't slated to be done yet. It isn't slated to be completed until early next year. Isn't that potentially putting the cart before the horse? Shouldn't we have the new NPR finalized to understand the landscape with regard to what we should agree to, in terms of a new START?

General ALSTON. Senator, I'll be glad to take a first answer there. Sir, I think the process that we have, that we are participating in with the NPR, has been a very collaborative process. It has been a very transparent process. Personally, I see very talented people that are trying to work these issues very much in earnest, very much in the open, and the Services have been a part of this process from the beginning. So, the dynamic that is helping work through these issues, I think, is a very positive dynamic, so I can't comment on assessing the pace. But, for the efforts that are underway, there's been very good, deliberate effort, and I think the work

is moving towards a productive outcome from DOD for the participation that the Air Force is having in this process right now.

Senator VITTER. I appreciate that. My question is about timing. Is it correct that that process is slated to be finalized early next year?

General ALSTON. Sir, I think the NPR is supposed to be complete by the end of this year, but clearly there's a relationship between the analysis that is underway with the NPR and the START activities. It's just the way the process is working right now.

Senator VITTER. I'm not sure I understand what that means. Let me ask it a different way. Does it make any sense to agree to a new START product before the NPR is completed and digested and understood, including by the START negotiators?

General ALSTON. Sir, I can't speak to that, I can only speak to the Air Force role contributing to that process. The Department would be ultimately responsible for the quality of the NPR product.

Senator VITTER. Mr. D'Agostino, maybe that's more appropriate for you to comment on that. It seems pretty logical that you want to complete and digest and understand the NPR before you agree to a new START. What's the matter with that assumption?

Mr. D'AGOSTINO. I think there clearly are two activities happening. In fact, one does inform the other activity. But, there's overlap. I think it is not unreasonable to say—there's a lot of detail that would have to happen in the NPR that doesn't have anything necessarily to do with START. If I can give an example or two, it might help, examples associated with maintenance of how we recapitalize our infrastructure, on what pace we would recapitalize our infrastructure, the actual different types of warheads themselves, where it depends on if the focus on the START number—the situation is a number and an agreement in a general direction. We can get the President, who's already said publicly that he is looking at a lower number than what the Moscow Treaty was and that he's interested in certain verification measures, as well. That framework is already established, in essence, and that provides a framework, so you don't have to wait until the NPR is exactly done, until the books are closed on it, because my expectation, frankly, what we want to do in the NPR process is, in fact, fairly accelerated.

The DOE, the NNSA, need elements of that NPR understood before we develop our budget for fiscal years 2011 through 2015, our 5-year budget. That is a program and budget that we're working on to get done by September of this year, so it's an element of the NPR process that's accelerated to get to that answer sooner so we can develop an actual program. In fact, that's exactly what we're going to do, and that's why General Alston described the NPR largely being completed by the beginning of the fiscal year later on this fall, if you will, because that's going to inform us as we develop, with DOD, our joint programs.

So, there's certainly some parallelism going on. I can't deny that, and I don't want to deny that. I don't want to send that signal. But, at the same time, because we have such very good collaborative process, frankly, and we've gone through, already, a couple of iterations of how policy drives the force structure and how the force structure drives the warheads, numbers, and types, we've gone

through an iteration that way. We have some sense of where things may end up. We don't want to give an answer right now.

Ultimately there's a negotiation piece with Russia; that's important. So, I'm very confident, because of the transparency and because of our desire to get that NPR largely done later this year, so we can finish our budget preparations, because we submit that to you, sir, in January, that we are on a very tight path, but doable, is how I would describe it. It's not just one finishes and then the other starts, sir.

Senator VITTER. I'm not suggesting it should be one finishes and then the other starts. I'm suggesting it should not be that the treaty finishes before the NPR finishes.

Mr. D'AGOSTINO. Yes, sir, I understand.

Senator VITTER. Do you understand the difference? I'm not saying the NPR has to finish before treaty discussions start, but it does seem a little odd for the detailed treaty negotiations potentially to finish before the NPR is finished. What am I missing?

Senator BILL NELSON. Let me interject, here. I think there's an element of this that the NPR discussions will inform the START negotiations, and the box that they find themselves in, that neither the Russians nor the Americans want this START extended. Under the terms of the treaty, it can only be extended for 5 years. Five years only. It can't be extended 1 year, it can't be extended 10 years. It can only be extended 5 years. So, the expectation may well be, according to the implication of your question, which I think is right on the money, is that these negotiations own what may end up being several treaties will be informed by the NPR discussions. Is that in the ballpark, Mr. D'Agostino?

Mr. D'AGOSTINO. That's my understanding, sir. I'm not an expert on the extension parts of the treaties, frankly, but that is, in essence—we can be informed enough by the work we've actually done to date on the NPR to start on the treaty discussions. Details do matter.

Senator VITTER. Start. But my question is about the finishing of the treaty discussions before you finish the NPR. Mr. Chairman, I appreciate your comment, and you make some very good points. But, forgive me, as a recovering lawyer, the first thing I would say is, I don't care what the current START says. You can sign a new treaty that's the same as the old one, with one comma missing, and it can last 6 months if you want to, if that's the smart thing to do, and it can be a new treaty that can just bridge to the next treaty, if that is the right thing to do, substantively. My only suggestion is, let's put substance first, whatever that is.

Mr. D'AGOSTINO. Yes, sir, absolutely.

Senator VITTER. I have a similar question about the Comprehensive Test Ban Treaty (CTBT). Now, I have to say, right off, my impulse about that is a lot different from START, which is—I questioned the whole premise of the soundness of the CTBT. But, Secretary Gates has said that, without testing, it will, "become impossible to keep extending the life of our arsenal." Given that, do you think any consideration—ratification of a CTBT should be preceded by plans for a new redesigned and more reliable warhead?

Mr. D'AGOSTINO. Sir, I would look at the question. I'm going to answer your question, but I would say, for the last 13-plus years—

or longer than that, frankly, 16 years—we have been operating, in effect, without underground testing, as a matter of policy. So, we have a program, a Stockpile Stewardship Program, designed to take a deep look inside our warheads, do an annual assessment.

In an earlier question, Chairman Nelson asked about beefing up our peer-review process to make sure that we can do that. I am comfortable that, with what I could call a sustainable effort on science, a sustainable effort on the facilities that are required that the country is going to need, and a sustainable effort on modernization activity for our stockpile, that we can maintain the stockpile well on out into the future, without underground testing. I would add that that's one element of the CTBT discussion, sir, that the Senate will be looking at, I'm sure. Another element, of course, is the verification questions, which are fairly complicated, deal with seismic issues and being able to find out what the rest of the world is doing.

The one comment I would like to make on that is, the same people that maintain our current stockpile and that we need to beef up, if you will, over the next few years, are the exact same people that do the intelligence analysis, the seismic analysis, as well. So, having a NNSA infrastructure that is taken care of out into the future is going to be an important part of a CTBT. That's the piece I'm going to make sure I communicate very clearly in this administration. That is my job, sir.

Senator VITTER. Okay. I take it from what you said that you just disagree with Secretary Gates that it will "become impossible to keep extending the life of our arsenal," without testing.

Mr. D'AGOSTINO. That's if we just leave the arsenal the way it is. In other words, to just do the day-to-day maintenance, I would agree with the Secretary, if we do what I would call the life-extension approach, which is a reuse or replacement approach—and I think this is where Secretary Gates was going, in effect, was modernizing, driving more reliable performance margins in there so we're sure we don't have to test—then my view is that we can do that in a nontesting future.

Senator VITTER. I just want to make clear, his comment was not about that, it was about testing. He said, "Without testing, we won't have this." You're disagreeing with that, correct?

Mr. D'AGOSTINO. I don't know the context of Mr. Gates's statement, so I think we are actually agreeing that if I can't modernize the stockpile, we're going to find ourselves where every year we're getting closer and closer to the point where the scientists and engineers in my organization—they're going to get to a point that say, Mr. President or Mr. Secretary, first, and then we tell the President, we're facing a moment of truth here with respect to testing, but we believe, in DOE or in the NNSA, that an integrated program of fixing the infrastructure, of working on the stockpile, and modernizing pieces of it, together with a science program to back it up, can take care of our nuclear deterrent out into the future indefinitely without testing.

Senator VITTER. I will try to get that full context to you. But, my understanding is, he wasn't talking about this, he was talking about testing. Without testing, we can't do this. But, I will get that.

Mr. D'AGOSTINO. I would love to come back on that.

Senator BILL NELSON. I would be surprised, Senator Vitter, if it were said in that isolated context, because I've had lengthy discussions with General Cartwright, the Vice Chairman of the Joint Chiefs, on this very issue, and I think he has every confidence to feel that, with the appropriate modernization program, that we can have the reliability we have to have. That's my impression.

Senator VITTER. I will get that context to you and follow up on the discussion.

Mr. D'AGOSTINO. I would love to do that.

Senator, I'd appreciate that.

Senator VITTER. Admiral, if I can ask you—and thank you for your visit yesterday; I enjoyed that very much—the fiscal year 2010 budget continues funding for the next-generation follow-on to the *Ohio*-class SSBN. Can you discuss the Navy's current plans for that next generation, and steps, in particular, that have been taken early on to try to ensure we don't experience cost overruns or scheduling delays?

Admiral JOHNSON. Yes, sir. This budget includes a request for $495 million to begin the work for the replacement of the *Ohio* class. The *Ohio* class is tremendously capable submarine today. It has no particular shortcomings. This request is based on the end of service life of that ship, which has been extended to 40 operational years. This is an on-time—it's not early, it's not late—it's an on-time start for the engineering and the research and development work to support and start construction in 2019. It's also on time with respect to the industrial base, and it's timed well to support our ally the United Kingdom. The work that we're doing early is concept work and missile launcher development prototype work, and it can be guided by the decisions of the NPR and the other events we talk about. I think it is well-timed to accommodate all the work that is going forward. It includes the early propulsion work for a ship of that size.

Senator VITTER. Great.

Thank you, Mr. Chairman, that's all I have.

Senator BILL NELSON. I want to take your previous question and now ask that of the Admiral. How can you start the design of the new submarine if you don't know the outcome of the NPR?

Admiral JOHNSON. Yes, sir. The very early work is concept work, layout, and qualification of vendors. In the case of the *Ohio* class, the youngest of the *Ohio* class is the *Louisiana*, delivered in 1996, so we have been out of production of large, heavy missile tubes and the launching equipment for about 25 years. So, this early work is a combination of laying out how we will make that part of the submarine acoustically quiet, and other characteristics because, of course, we have very quiet attack submarines, but they do not have a missile compartment. It will be assessing how to do design and build that part of the ship, the missile compartment, with the same labor-saving techniques that we used on the attack submarines, in that section of the ship that we have not looked at in our Navy for almost 40 years.

So, the exact number of tubes, the exact number or dimensions of those tubes, the exact speeds, none of those things need to be known in the first year of concept and research and development. Instead, we do things like we find a vendor capable of doing a mis-

sile hatch of that size out of the type of materials that we need to do—a core test article, which is representative, but not identical—and then destructively test it to make sure that vendor can give us a device or a hatch without flaw.

Senator BILL NELSON. General Alston, the same question. How can you design a future airplane without knowing the results of the NPR?

General ALSTON. Sir, we won't do that. The follow-on bomber requirements—we heard the Secretary of Defense loud and clear, in terms of our requirement to improve and take a harder look at the requirements that we had already posited, as well as the technology that would be available at the time that we need this penetrating platform to be available. This platform would be informed by the Quadrennial Defense Review (QDR), probably even more so than the NPR, but we do see linkages between both of those examinations, and we think that we will be better informed as the QDR and the NPR analysis continues. So, we think there's a strong relationship between the two studies, and the outcome of that, with a better set of requirements for that platform in the future.

Senator BILL NELSON. Is the B–1 bomber going to be part of the Global Strike Command?

General ALSTON. No, sir, it's not. It's a conventional-only platform, and that will remain in the Air Combat Command.

Senator BILL NELSON. Did you have a question, Senator Vitter?

Senator VITTER. I just have one followup.

Senator BILL NELSON. Go ahead.

Senator VITTER. I just wanted to follow up on the Senator's line.

Admiral, I take it from what you're saying, you would never, for instance, finish design of a submarine before the NPR was finished.

Admiral JOHNSON. Yes, sir.

Senator VITTER. General, similarly, you would never finish design of a new aircraft before this NPR is finished.

General ALSTON. No, sir.

Senator VITTER. I was just suggesting, earlier, that logically it seems pretty clear to me we shouldn't finish a new START before the NPR is finished. That was my earlier point.

Senator BILL NELSON. General Carpenter, from an operational perspective of the 8th Air Force, what are your plans to balance the conventional and nuclear excellence of the bomber force?

General CARPENTER. Sir, we've been doing that for a long time, ever since we took on the conventional mission in full force, starting around the Operation Desert Storm timeframe, but with the recent issues with the nuclear mission, obviously we've put a lot more focus on the nuclear side, and we designed the global deterrent force to address that issue. But, we've put a wing in the bucket, if you will, for the nuclear mission, and they stayed there for a whole year. So, while Minot Air Force Base is in North Dakota, the 2nd Bomber Wing at Barksdale is focused on the nuclear mission. So, we have that balance now.

The 4th Squadron becomes a big issue now. When we stand up the 4th Squadron at Minot, it fills out that force, so we have enough force structure to separate that mission as we can.

So, while neither are always exclusively focused, we always have to keep the nuclear certification, the crews ready to go, and the nu-

clear and on the conventional side, both, but the focus shifts from day-to-day, or from year-to-year, if you will. So, while the Global Deterrent Force, 2nd Bomber Wing right now—or, I'm sorry—and I got that backwards—2nd Bomber Wing is in Guam today, and Minot is in the Global Deterrent Force, kind of really focused on the nuclear mission, and that swaps back and forth. The B–2s don't have the luxury of having two separate wings, but they have two separate squadrons. So, those two squadrons rotate back and forth, as well, where one is always assigned the Global Deterrent Force mission, and they focus, primarily at least, on the nuclear mission. When they do the training, they really go out and focus on the nuclear side. Then, the other squadron is the conventional role. So, we're able to do that with the force structure we have today.

General ALSTON. Sir, I just might add that, to the credit of 8th Air Force and General Elder and now General Carpenter, all three of our bomber wings have undergone no-notice nuclear surety inspections and have all passed those inspections. Those are exceptionally rigorous tests of nuclear requirements, and so, we are showing some positive results in that regard.

Senator BILL NELSON. All right. Now, we're expecting B–52s and B–2s to take us all the way through 2030. Are we going to be able to sustain their viability?

General ALSTON. Yes, sir, we will. I would ask General Carpenter to comment on this, as well, but first let me just say that the B–52 has a lot of life left in it, and we have plans in place to ensure its vitality in both the nuclear and conventional roles into the out-years. The B–2 ultimately will be facing threats that will exceed its capability as a penetrating platform; hence, the reason that we believe we need a penetrating platform to take on that responsibility when the B–2 may no longer be as effective at that role as we believe it is today.

General CARPENTER. I would agree, sir. The great programs we have in place now, with the radar programs and all three bomber platforms—the B–2 specifically, and the B–52 on the books, and the B–1, as well, and the communications upgrades we have planned for all those platforms—it will take them well into the 2040 timeframe. So, yes, sir, we can sustain those weapon systems.

Senator BILL NELSON. General Alston, you've had to work overtime to straighten out the loose nukes and all of that. Have you got it under control?

General ALSTON. Sir, we absolutely have it under control. As you may know, I came into my Pentagon tour about 21 months ago, which happened to coincide within days of the challenge that we had with the unauthorized munitions transfer. So, I've been personally focused on this through this entire assignment.

My responsibilities have shifted, and right now, as a consequence of Secretary Donley's and the Chief of Staff, General Schwartz's, decision last fall, I work directly for the Chief of Staff now in my responsibilities, on their behalf. Their personal leadership drove us to prepare a roadmap that we published last fall to set the course, with six principal strategic objectives to help the institution focus better and achieve the outcomes that we are starting to achieve at this time.

General Carpenter's folks and our other deployed commanders, with a lot of very aggressive personal leadership, are ensuring the success that we have today. But, we need to move forward with the personnel development changes that we have underway. We're bringing an additional 2,500 people into the nuclear mission over the course of this next year.

General Chilton has pointed out in previous Defense Science Board studies, there has been an erosion of nuclear deterrence skills. So, the people component of our effort will continue to require the kind of vigilance and focus that we have in motion right now, and I believe it will take several more years before we feel that we have completely overcome some of the skill challenges we have.

But, we have aggressive inspection programs, we have 100 percent oversight of all of our inspections. We've changed the Air Force corporate structure to have a dedicated nuclear operations panel. This is going to ensure a very thorough vetting of nuclear-related requirements so that they compete well for Air Force resources. Air Force leadership intervention has ensured very good resourcing of the nuclear mission at this time. So that's a thumbnail of the number of programs that we have underway that is fulfilling the Chief and Secretary's establishment of reinvigorating the nuclear enterprise as the Air Force's number-one priority in the strategic plan.

Senator BILL NELSON. Part of our labs need to help out the intelligence community to support the analysis of foreign nuclear capabilities. There's no funding in your budget for 2010 in the NNSA fiscal year 2010 budget request. Are you going to be needing funding for this, coming up in the future?

Mr. D'AGOSTINO. For intelligence analysis, sir?

Senator BILL NELSON. For analysis of foreign nuclear capabilities and the proliferation challenges.

Mr. D'AGOSTINO. In a way, the intelligence funding request comes through another part of the Department, not through the NNSA. But, what I would say, with respect to your question, the funding that we do—the same people that do this intelligence analysis are the same people that are either experienced weapons designers, people that understand the physics behind how to understand timers, special detonator devices—these are the same people that we start off with in the NNSA. Ultimately, as they go through our program, they can shift to other divisions in the laboratory. So, Z Division, for example, at Lawrence Livermore National Laboratory, funded through the intelligence program, essentially contained people that started off in my program in the NNSA.

So, the funding that I have ultimately supports intelligence, but in an indirect way, by exercising the capabilities, by getting these folks exercised, not only experiments, but having this design experiment.

That essentially goes to the previous questions we talked about, is, are we sustainable, in the long term? That is why I want to get the science and the infrastructure pieces essentially on the right track.

We've turned it around in this budget. We've shifted $130 million back into the science area, for this very reason. My view is, in the

out-years we'll ultimately need more, and that will be, ultimately, my job within the administration, to work this problem in the out-years.

Senator BILL NELSON. You're going out to outside financing for a number of the buildings that you need. Why wouldn't you ask for a government line item?

Mr. D'AGOSTINO. I'll go. For an example, one of the facilities you probably allude to, sir, is our Kansas City project. That is a General Services Administration project. There are a couple of reasons, but let me focus on one that is particularly attractive to me as we look at transforming ourselves from a kind of a Cold War nuclear weapons complex into a 21st-century nuclear security enterprise, and that is, I don't know what the future brings with respect to unclassified parts that the Kansas City plan may need to make. We may find, as a result of our modernization efforts, that we can reduce the number or the complexity of these non-nuclear parts and find ourselves much more efficient, 20 years from now, if you will, from being able to make those parts at our laboratories.

There's a certain attractiveness that I find in driving efficiency in the program if I have a 20-year lease that is approved, of course, appropriately—there's a financial payback, in this case, of $100 million a year that has been audited, we believe—but being able to say, 20 years from now, I'm not building a facility that the Nation does not need way out into the future. So, from my standpoint, there's a certain attractiveness in being able to say, 20 years from now, turning that manufacturing facility back over to the developer, and not having to worry about maintaining the structure out on the taxpayers' burdens.

Senator BILL NELSON. Let's talk about Los Alamos and Y–12. That's where the problems are. Tell us about that.

Mr. D'AGOSTINO. Los Alamos has a proposal that I have not approved yet. It's a proposal, right now, for a science complex. It's a proposal that we agree that we need to get people out of trailers at the laboratory. These are our world-class scientists, and yet, we have them in facilities, frankly, that I'd be embarrassed to have any of these folks go into. So the laboratory is looking at—and we agree that there's a need, but now we're in the process of examining—should it be a third-party-financed facility, should it be a line-item facility, do the numbers work, does the analysis come through? General Harencak, who's with me, who's running defense programs—I talked to him this morning, frankly, about, where are we on our third-party-financed projects? He's looking at this—DOD calls it an alternative analysis. What are our options with respect to acquisition? Doing what we need for our scientists.

One thing that's clear to me, though, is, for facilities that are—we have to be very careful about employing this technique. For one thing, it has to be done judiciously. Obviously, it has to make a lot of sense, financially, for the taxpayers. Obviously, it can't put us in the position where we have to be moving large fences around and having pockets of uncleared spaces, because, ultimately, if the country decides it doesn't need it anymore, then we turn it back over to the developer, and then we have an issue of fencelines and the like.

Senator BILL NELSON. The lease would probably provide that, if you can't fill it up with the government activities, that they could lease it on their own.

Mr. D'AGOSTINO. If the government walks away from the lease, and each arrangement is, in effect, different. Certainly——

Senator BILL NELSON. But, let me just cut to the chase.

Theoretically you wouldn't have the space leased; they could lease the space. You'd be inside the fence.

Mr. D'AGOSTINO. Theoretically, if we ended up that way, yes, sir. Theoretically, yes, sir.

Senator BILL NELSON. Okay. You have to watch that.

Mr. D'AGOSTINO. Yes, sir, absolutely.

Senator BILL NELSON. We had some very serious problems at Air Force bases, on Air Force housing, with the result that, inside the fence, at the Air Force base, you could have private housing, because the housing could be rented to non-Air Force personnel. Now, there's a pecking order that they would have to go through, but, theoretically, at the bottom of the pecking order, you could have somebody just off the street renting a house inside an Air Force base. That's what our present condition is. So, we don't want that, especially when you start fooling around with facilities in your line of work.

Mr. D'AGOSTINO. Yes, sir.

Senator BILL NELSON. The Los Alamos Neutron Science Center, an accelerator facility that produces protons for a variety of scientific and weapons research, was supposed to have an upgrade beginning in fiscal year 2010, but the upgrade was not funded. Is this upgrade necessary to maintain nuclear weapons?

Mr. D'AGOSTINO. Sir, the facility is definitely necessary to maintain our stockpile. The upgrade reduces the risk that the facility will not—reduces the risk. We want the facility, of course, online to support our deterrent out into the future. So, the upgrades approach was to take away a fair amount of risk associated with the facility going down. You're right, sir, first of all, we continue to operate that facility. Second of all, you're absolutely right, we need it for neutron cross-section measurement for doing material science, nuclear science.

Senator BILL NELSON. Okay. So, you're saying you need it. So, what happens to the facility without the upgrade?

Mr. D'AGOSTINO. What happens without the upgrade is increased risk associated with operations. It's a fairly old facility. It's something that I believe is an important part of maintaining a deterrent and maintaining a laboratory, quite frankly, that can attract scientists that want to work in material science and in nuclear science.

Senator BILL NELSON. All right. How much will the full upgrade cost, and how long will it take?

Mr. D'AGOSTINO. I'll give you a sense, sir, but I would like to take that for the record, if I could.

There's rough numbers of $150 to $200 million or so, as preconceptual design activities, but I don't have the particulars. If I could take that for the record, I will provide the answer.

[The information referred to follows:]

The Los Alamos Neutron Science Center refurbishment project would replace major components of the accelerator and accelerator control system that are required to maintain reliable operations and extend the life, but would not alter the design capability or capacity. The cost is currently estimated at $149 million, and the project could be completed within a few years of receiving full funding. This estimated cost places the project within the oversight guidelines of the Department of Energy order for project management. This order requires the cost for a project of this size to be validated; therefore, it is possible this estimate could fluctuate.

Senator BILL NELSON. Do you have a guess on how long?

Mr. D'AGOSTINO. Multiple years. It's not a 2-year activity. It's probably 3 to 5 years, sir.

Senator BILL NELSON. Let me ask each of you, were your top five unfunded priorities—if funds were available, what would your top five be?

Admiral JOHNSON. Sir, I would like to take that question for the record, if I may.

Senator BILL NELSON. Okay. So, you have to counsel up the chain of command?

Admiral JOHNSON. Yes, sir.

Senator BILL NELSON. Okay.

General ALSTON. Sir, the Air Force would have to do the same. We would like to take that for the record.

[The information referred to follows:]

Admiral JOHNSON. The President's budget represents the best balance of resources to requirements. The Chief of Naval Operations' top unfunded priorities includes SSP's considerations and represents the top priorities of the Navy if additional funding should become available.

General ALSTON. Currently we have identified only one unfunded strategic deterrence-related requirement for fiscal year 2010, the B–52 1760 Data Bus Internal Weapons Bay programs, which is on the unfunded requirements list submitted by the Chief of Staff on 18 May 09. The B–52 1760 Weapons Bay unfunded requirement totals $30.6 million which funds modification of the bay to add internal carriage capability for smart weapons and overall bomb-load capacity on the B–52. We will continue to identify areas requiring additional funding, and develop strategies to meet all combatant commanders' requirements.

Senator BILL NELSON. Do you want to take a stab at it? [Laughter.]

Mr. D'AGOSTINO. I'd like to provide the details for the record, but what I would like to iterate—and I can give you my—three broad priorities, are——

Senator BILL NELSON. Modernization?

Mr. D'AGOSTINO. Yes, sir. Modernization. It's the science and the infrastructure that need to do that. But, we'll take the question for the record, sir.

[The information referred to follows:]

Our top five unfunded priorities, if funds were available, would be to: (1) fully satisfy our Directed Stockpile Work program of work, including targeted life extensions for the weapon systems which support the Navy and Strategic Command needs and meet our extended deterrent obligations to our allies; (2) protect, replenish, and sustain the science, technology, and engineering capabilities required to leverage the Nation's significant investment in science-based tools to assess the state of the stockpile and certify it's safety, security, and reliability; (3) recapitalize our Cold War infrastructure so that our special nuclear materials (plutonium and uranium) processing capability is assured for the unknown future, including actions that will greatly reduce the size of the complex and reduce our security costs; (4) begin work on specific projects in the Global Threat Reduction Initiative that will help achieve some of the goals in the President's speech in Prague; and, (5) support International Materials Protection and Cooperation activities to reduce special nuclear material

inventories through down-blending, and initiate activities to upgrade security in countries outside of the Former Soviet Union.

Senator BILL NELSON. Okay.

Thank you all very much. The record will be kept open for 3 days.

The hearing is adjourned.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR BILL NELSON

AIR FORCE NUCLEAR ENTERPRISE

1. Senator BILL NELSON. General Alston, are there any authorities that you need or that your successor will need to fully manage, oversee, and coordinate the Air Force nuclear enterprise?

General ALSTON. I am confident we have the requisite authorities and structure in place to ensure enduring stewardship, manage, oversee, and coordinate the Air Force nuclear enterprise. The establishment of AF/A10 sends a clear and visible signal that the Air Force is committed to resolving the fragmented lines of authority across all levels of the nuclear enterprise and provides a headquarters Assistant Chief of Staff that reports directly to the Chief of Staff with authority to drive nuclear enterprise policy, guidance, requirements, and advocacy across the Air Staff. I am the single Air Staff authority for all nuclear-related issues and have lead responsibility for nuclear operations, plans, policy, and requirements.

INSPECTIONS

2. Senator BILL NELSON. General Alston and Admiral Johnson, the Defense Threat Reduction Agency (DTRA) also has a role in conducting inspections at nuclear facilities. How are the DTRA inspections coordinated with the service inspections, what do the DTRA inspections cover that the service inspections do not, and what is the benefit from each type?

General ALSTON. DTRA inspects Air Force nuclear certified units in accordance with T.O. 11N–25–1, Department of Defense (DOD) Nuclear Weapons Technical Inspection System. These inspections are coordinated with the Air Force Inspection Agency (AFIA) and the appropriate nuclear major command. DTRA inspections encompass those criteria established in T.O. 11N–25–1. The Air Force inspects using the same guidance, as well as that contained in AFI 90–201, Inspector General Activities, and major command specific supplemental guidance. Additionally, AFIA conducts independent oversight of Air Force nuclear surety inspections. DTRA inspections allow for an independent assessment, validation, and/or oversight of DOD nuclear weapon surety for the Chairman, Joint Chiefs of Staff. Air Force inspections, in line with their supplemental guidance, validate mission readiness as well as nuclear weapon surety for the major command commander and the Secretary of the Air Force.

Admiral JOHNSON. There are two types of DTRA inspections associated with Navy nuclear weapons certified units. A Defense Nuclear Surety Inspection (DNSI) is conducted on a not-to-exceed 5-year basis for each certified unit. DTRA is also tasked to conduct Surveillance Inspections (SI) that involve DTRA inspection team members providing an over-the-shoulder assessment of the Navy's inspection team performance during a scheduled service Navy Technical Proficiency Inspection (NTPI).

DTRA inspections of Navy nuclear weapons units are coordinated annually through direct liaison with the organizations responsible for Navy inspections. DTRA coordinates inspection scheduling of Navy afloat units with the type commanders for submarine inspections and with SSP for Strategic Weapons Facility inspections.

DTRA inspections evaluate the 10 areas directed by the Joint Staff (JS) approved Special Weapons Ordnance Publication 25–1 which includes Management and Administration; Technical Operations; Tool, Test, Tiedown, and Handling Equipment; Condition of Stockpile; Storage and Maintenance Facilities; Security, Safety, Supply Support; Nuclear Weapon Personnel Reliability Program; and Logistics Movement. A NTPI covers an additional four areas which include Nuclear Weapons Radiological Controls; Radiation Health; Command and Control; and Nuclear Weapons Accident/Incident procedures.

The benefit of DNSI is subjective and has been called into question by recent DOD level reports: Defense Science Board Report of Nuclear Surety Inspections, Schlesinger Commission Report, and others.

3. Senator BILL NELSON. General Alston and Admiral Johnson, do you see any use in joint Air Force-Navy inspections? Would joint inspections address, among things, the shortage of skilled inspectors?

General ALSTON. The Air Force fully supports the current joint inspection process performed by DTRA. Any new joint inspection requirement for Air Force personnel would have limited applicability due to Service-specific mission requirements and weapon systems.

Admiral JOHNSON. Joint inspections occur today in the form of DTAR DNSI.

Variations exist in technical operations and weapons system facility design between Air Force and Navy. A more consistent Office of Secretary of Defense (OSD)/Navy/Air Force criteria for inspection will better support a more streamlined DNSI process in the future.

BOMBERS AND GLOBAL STRIKE COMMAND

4. Senator BILL NELSON. General Alston and General Carpenter, the new Global Strike Command, which will stand up at the end of the year, will eventually have responsibility for the B–52 and B–2 aircraft. It will not have responsibility for the B–1 aircraft. While I understand that the B–1 is no longer nuclear capable, on many occasions we have been told that the new Global Strike Command is not a reincarnation of the old Strategic Air Command and is not "nuclear command". In any event, the majority of the B–1, B–2, and B–52 sorties is, and will continue to be, conventional. I would like to get your personal and professional views on whether the B–1 should or should not be part of the new command and why?

General ALSTON and General CARPENTER. The Air Force is reversing the trend of declining nuclear mission focus and erosion of nuclear expertise. One of the root causes of this trend was fragmented lines of authority and responsibility of our nuclear forces. Global Strike Command was created to align all nuclear forces under a single command and demonstrate full commitment to the global strike mission.

While our primary focus is on reinvigorating the nuclear enterprise, we do realize there is a vital conventional mission for our B–52s and B–2s that must not be compromised. The B–1 is currently being used as a combat support aircraft in today's operations, and related organize, train, and equip responsibilities will be retained by Air Combat Command. Additionally, Global Strike Command will provide the necessary leadership and focus to effectively balance the nuclear and conventional missions of the B–2s and B–52s to ensure they are ready to support the warfighter when called upon by combatant commanders.

LOS ALAMOS NEUTRON SCIENCE CENTER

5. Senator BILL NELSON. Mr. D'Agostino, the Los Alamos Neutron Science Center (LANSCE), an accelerator facility that produces protons for a variety of scientific and weapons research, was supposed to have an upgrade beginning in fiscal year 2010, but the upgrade was not funded. Is the LANSCE upgrade necessary to maintain nuclear weapons?

Mr. D'AGOSTINO. The LANSCE facility is currently used to conduct experiments to answer specific stockpile-relevant questions, the answers to which are required to improve the science-based tools which allow certification of the nuclear weapons stockpile without resorting to underground nuclear testing. Those experiments include precision measurements of nuclear data on special materials important to nuclear weapons performance, classified experiments, and experiments utilizing high explosives and proton radiography. The weapons program requires data from LANSCE. The loss of the data from LANSCE would seriously affect our ability to improve our stockpile stewardship tools and therefore our capability to maintain the stockpile without testing. Unfortunately, the LANSCE accelerator facility has not received adequate preventive maintenance for years. Many of its components are long past their expected lifetimes and spares are in short supply. In the opinion of experts, the accelerator is "running to failure." The failure of any one of the major components could result in a loss of continued operation of the facility for an extended period. The probability of a failure grows each year without refurbishment; yet other funding priorities within funding constraints have required that the National Nuclear Security Administration (NNSA) continues to absorb this risk. It was a Presidential initiative to cancel the original LANSCE refurbishment partly be-

cause we acknowledged that cheaper approaches to ameliorate these problems were available. These are now under consideration.

6. Senator BILL NELSON. Mr. D'Agostino, what happens to the LANSCE facility without the upgrade?

Mr. D'AGOSTINO. It isn't really possible to know how long the accelerator will be able to operate without refurbishment. All of the individual components are in principle repairable indefinitely, but in practice, we expect that the reliability of the facility will continue to decay without further investment. Without the refurbishment, we are accepting increased risk of major component failures affecting continued operations and increasingly large downtime.

7. Senator BILL NELSON. Mr. D'Agostino, how much would the full upgrade cost and how long would it take to complete?

Mr. D'AGOSTINO. The LANSCE refurbishment project would replace major components of the accelerator and accelerator control system that are required to maintain reliabe operations and extend the life, but would not alter the design capability or capacity. The cost is currently estimated at about $150 million, and the project could be completed within a few years of receiving full funding. This estimated cost places the project within the oversight guidelines of the Department of Energy order for project management. This order requires the cost for a project of this size to be validated; therefore, it is possible this estimate could fluctuate.

NATIONAL NUCLEAR SECURITY ADMINISTRATION REORGANIZATION

8. Senator BILL NELSON. Mr. D'Agostino, the Strategic Posture Commission made several recommendations with respect to the organization of the NNSA. One in particular was focused on the regulatory environment. It appears that there might have been some confusion on the part of the Commission with respect to the role of the Defense Nuclear Facilities Safety Board (DNFSB), which is not a regulatory body, when they suggested that the nuclear weapons complex be regulated by the Nuclear Regulatory Commission (NRC) rather than the DNFSB. Have you looked at the cost and the impact of having the nuclear weapons complex regulated by the NRC in lieu of the self-regulation that is in place today?

Mr. D'AGOSTINO. The NNSA has considered the impact of having the weapons complex regulated by the NRC in lieu of self regulation. We have not evaluated the cost impact of NRC regulation as opposed to self-regulation; however, there are several reasons that continued self-regulation is advisable.

The first is that self-regulation has demonstrated an enviable nuclear safety record. Although the Commission was critical of our treatment of requirements, it did not question the safety of our operations.

The second is that self-regulation permits the operational flexibility we need with respect to nuclear safety requirements to ensure we meet our mission. Following recommendations from the Colombia Accident Investigation and those of the DNFSB, we have established a Central Technical Authority and associated safety infrastructure to evaluate and concur on requests for relief from nuclear safety requirements where appropriate. Since September 2005, we have received and evaluated 20 requests for related exemptions. Only two were ultimately denied. Our streamlined evaluation process allows a quick turnaround where warranted, and exemptions have been concurred on in less than a day from receipt. Such responsiveness would not be possible with external regulation. Our demonstrated ability to grant relief where warranted provides effective control over the requirements under which we operate.

Finally, external regulation would not relieve NNSA from the need to oversee nuclear safety. Most of our nuclear facilities are unique and provide products and services that are vital to our mission and that cannot be obtained elsewhere. In addition to possible damage to personnel, public, and the environment, a serious accident in one of our facilities would result in a loss of capability that would jeopardize our mission. If a public power utility has an accident, power can be obtained at a higher cost from other utilities. The same is not true for our operations. If our plutonium facility (for example) shuts down there is no replacement for the lost services and our mission is crippled. The same is true of most of our facilities. Thus, from a business perspective, our mission responsibilities require us to ensure that our nuclear facilities are operated safely. External regulation would result in more oversight, not less. These and similar considerations have led us to conclude that it is best if NNSA continues to self-regulate.

TRIDENT D–5 MISSILES

9. Senator BILL NELSON. Admiral Johnson, the Navy is moving towards more fixed-price type contracts to purchase the D–5 ballistic missile, which is used on the Trident ballistic missile submarine. In making this transition what are the issues that concern you most?

Admiral JOHNSON. SSP recognizes the potential value of using fixed-price type contracts for mature production efforts and has committed to transition to the use of such contracts beginning in fiscal year 2011, where appropriate. As we make this transition there are several issues that concern us.

First, there is a concern that the contractor may be motivated to make cost, performance, and safety tradeoffs that might not be in the best interest of the program or the Nation. Through the years, SSP has developed and implemented an acquisition strategy that maintains a primary focus on safety and reliability, while managing cost risk at or below budget. Because of the strategic importance of the system, any deviation from this successful acquisition strategy could engender unintended consequences that could impact the safety and reliability of the weapon. SSP will closely monitor contractor performance to ensure we maintain the optimal balance between contractor assumption of significant cost risk and managing an acceptable level of technical risk.

Our second concern is maintaining the affordability of the system. While Trident II (D5) is a mature production program, the nature of the technical requirements leads to a program that still contains significant risk. The technical requirements of the D5 missile are unique in many respects. The volume limitation of the launch tubes combined with the stringent range performance requirements dictate the need for high energy class 1.1 propellants in the rocket motors. This technology is unique to the Submarine Launched Ballistic Missile (SLBM) systems, and is not otherwise supported by other DOD or commercial (space) applications. A similar situation exists for the Trident Post Boost Control System components. Driven by the requirement for a Multiple Independently Targeted Re-entry Vehicle capability and the submarine safety requirements of using solid propellants, the designs, materials, and processes are unique to the SLBM system and are not supported by other government or commercial applications. Additionally, the electronics designs are driven by the need for radiation hardened components capable of performing in hostile environments. These unique requirements combined with very low production rates driven by budget constraints result in an increasingly fragile supplier base which requires constant management and oversight by the prime contractors to ensure a continuous supply of safe, reliable components. The ever present potential for complex, expensive efforts to requalify substitutes for legacy technologies and loss of suppliers represents significant cost risk along with the attendant technical risk which, in a fixed-price environment, would inevitably result in higher prime contractor cost proposals.

Finally, we are concerned about the potential degradation of the open communication between SSP and its prime contractors. The success of the Trident program is due in no small measure to the cooperative government/contractor partnership developed over the past 50 years. When potential problems are identified they are discussed openly and solutions are developed through a collaborative effort. In a fixed-price environment, our contractors may be more motivated to unilaterally increase technical risk in an effort to save costs. This incremental increase in program risk may not be immediately apparent, but could lead to a cumulative unacceptable level of risk in the program.

HELICOPTERS FOR THE ICBM FIELDS

10. Senator BILL NELSON. General Alston, for years the Air Force has been searching for replacement helicopters for use in the ICBM fields. In your prepared statement you are introducing a program to replace the old, Vietnam-era helicopters. What is the new program and what is the fiscal year 2010 funding?

General ALSTON. The Common Vertical Lift Support Platform (CVLSP) program will replace the existing 39 year old UH–1N helicopter fleet. CVLSP will provide vertical lift support for a number of missions including: Intercontinental Ballistic Missile (ICBM) nuclear weapon convoy escort, ICBM emergency security response, and National Capitol Region emergency response support. The UH–1N has deficiencies in carrying capacity, speed, range, endurance, and survivability for meeting mission requirements.

The fiscal year 2010 budget requests $9.5 million of RDT&E for the CVLSP program. This funding supports development of statutory and regulatory acquisition

documentation along with activities to support a request for proposal and source selection.

MISSILE AND COMPONENT TESTING

11. Senator BILL NELSON. Mr. D'Agostino, General Alston, and Admiral Johnson, the Services and NNSA work together to establish and conduct a minimum number of missile and component tests to ensure reliability. Most years there are not enough tests to meet the minimum standards. What is the minimum number of tests, including the number of joint test assemblies (JTAs), that are needed in fiscal year 2010 and are all of these tests funded? If not, why not?

Mr. D'AGOSTINO. Each weapon system has a testing plan that will feed the reliability model so a proper reliability assessment can be made. The number and type of tests for each weapon system varies every year based upon trends that are discovered and data gaps from previous years. NNSA accomplishes system, component, material, margin, aging, and flight tests as well as performing modeling and simulation programs. Joint flight testing with the DOD has the highest priority within the surveillance and assessment program. There are currently 19 joint flight tests planned for fiscal year 2010. All are fully funded. While additional laboratory tests would certainly enhance our confidence in the stockpile, NNSA must also prioritize this testing and assessment work against all of the other NNSA workload to maximize the benefit of the budget allocation.

General ALSTON. Reliability testing involves both the delivery system and the warhead or bomb. DOD's portion of weapon system reliability is computed using the delivery system reliability combined with the weapon's or bomb's reliability. Warhead and bomb reliability testing requirements are NNSA's responsibility, with the number of associated JTAs determined in consultation with the Services.

A minimum of four ICBM tests, all using JTAs, are required to determine weapon system reliability. The Air Force conducts approximately one test every 4 months, resulting in a 16-month cycle to determine weapon system reliability. This frequency meets the minimum requirement for nuclear weapons planning activities.

A minimum of eight gravity weapon tests per year (five strategic and three nonstrategic), all using JTAs, are required to determine reliability.

A minimum of eight Air Launched Cruise Missile tests per year, three using JTAs, are required to determine reliability.

In total, the Air Force has 19 fully funded reliability tests scheduled in fiscal year 2010, 14 of which will also contribute to warhead reliability testing, requiring NNSA support with JTAs.

Admiral JOHNSON. Reliability is determined by a combination of flight test and ground test activities. The Navy performs four Trident II Follow-on Commander Evaluation Tests to validate that the weapons system continues its demonstrated performance in terms of reliability and accuracy as required by U.S. Strategic Command Instruction 526–1. Within the Navy flight test program, we fly four test heads (three NNSA JTAs and one Navy Enhanced Navy Test Bed) per weapon type to maintain reliability of Navy/NNSA components. These flight tests and hardware are funded in the President's budget request. The Navy requirement for ground test evaluation is 11 warheads per year to be disassembled, tested, and 10 reassembled into war reserve units. The Navy portion of the cost of this testing is in the President's budget, the NNSA portion should be in the NNSA budget.

B–2

12. Senator BILL NELSON. General Carpenter, the B–2 budget request for fiscal year 2010 includes $16.8 million to integrate the Massive Ordnance Penetrator (MOP) on the B–2. Has DTRA completed the MOP development program?

General CARPENTER. No, the DTRA technology demonstration is scheduled to complete in calendar year 2009. The MOP is being developed in three phases. Phase I (Concept Refinement) and Phase II (Design and Preliminary Testing) have been successfully completed. Phase III, Weapon Performance Demonstration, is underway and will culminate with MOP research and development flight tests from a B–52 aircraft.

B–2 integration efforts are occurring concurrently with the DTRA effort and will culminate with final hardware buildup and testing during the Air Force program.

13. Senator BILL NELSON. General Carpenter, what is the capability and purpose of the MOP and why is it being integrated on the B–2?

General CARPENTER. MOP will provide the B–2 with a capability to defeat very hard and deeply buried targets such as deep bunkers and tunnel facilities. MOP is designed to improve weapon survivability, lethality, and penetration compared to existing Air Force penetrator weapons.

The purpose of MOP technology demonstration program is to demonstrate the survivability, lethality, and penetration of a 30,000-lb. class penetrator weapon. The purpose of the MOP Quick Reaction Program is to deliver an improved Hard and Deeply Buried Target (HDBT) defeat capability beyond the Air Force's current (2,000-lb. and 5,000-lb. class) penetrator weapons.

MOP is being integrated on the B–2 to provide a capability to defeat high value assets in HDBTs in a high threat environment.

14. Senator BILL NELSON. General Carpenter, what is the requirement that the MOP is satisfying?

General CARPENTER. MOP requirement is captured in the following Joint Requirements Oversight Council validated documents: HDBT-Defeat Mission Area Initial Capabilities Document (ICD) dated January 20, 2005; and in HDBT Characterize, Engage and Assess ICD dated September 19, 2005. Those documents specify a requirement for improved HDBT defeat capability beyond the Air Force's current (2,000-lb. and 5,000-lb. class) penetrator weapons. Additionally, the 2006 HDBT Analysis of Alternatives Weapons Effectiveness Study found that MOP provides greatly improved HDBT defeat capability and the 2007 Air Force Capabilities Review and Risk Assessment highlighted the need for HDBT defeat capability. Most recently, the Air Force received an Urgent Operational Need (UON) request for a HDBT capability. The UON has been endorsed by multiple COCOMs.

FUTURE CONCEPTS

15. Senator BILL NELSON. Mr. D'Agostino, General Alston, and Admiral Johnson, in thinking about the future of the life extension programs for nuclear weapons in a smaller stockpile without testing, there may be opportunities to fundamentally improve the safety, security, and reliability of the weapons. This could include having a complete inventory of weapons with fire-resistant pits, insensitive high explosives, and other safety and security features. To do this could require replacing or rebuilding the pit or the secondary and other components of a weapon or slightly reducing the yield of the weapon. Have there been discussions about this type of approach for the future?

Mr. D'AGOSTINO. Yes, NNSA is working closely with DOD to study opportunities for life extension programs (LEPs) that would increase surety (safety, security, anti-use control) and reliability in the nuclear weapons stockpile. Within the context of the joint NNSA–DOD Phase 6.x acquisition process, NNSA iterates the military requirements with the DOD and conducts design and trade studies. These studies examine trade-offs between improvements in surety and potential reductions in performance (yield), as well as other impacts to both DOD and NNSA. The amount of rework required to improve weapon surety varies between weapon system and detailed assessments already required to understand the trade space. The optimal technical approach for the future involves modernizing the stockpile by selecting from among the spectrum of options described in the Perry/Schlesinger Congressional Posture Review Report. Success in improving the safety, security, and reliability of the nuclear weapon stockpile will require all of the tools developed in the stockpile stewardship program and support for the Nation's nuclear weapons enterprise. The affordability of making such improvements in safety and surety must ultimately be considered in relation to other priorities. Such investment decisions should be made on the best available analysis as derived from the planned studies.

For example, the current B61 LEP Phase 6.2 (Feasibility Study and Option Down-Select) was initiated by the Nuclear Weapons Council in September 2008, and is conducting an assessment to determine requirements and options for improving safety, security, use control, and reliability. This study is examining the amount of pit and secondary work that would accompany certain proposed surety enhancements. Although the B61 is an insensitive high explosive (IHE) weapon, and contains some of the most advanced surety features in the stockpile, additional features are being considered to address current and postulated future threats. Other weapons could require even more extensive nuclear explosive package (NEP) modifications to update their surety features, to include, for instance, replacing conventional high explosive with IHE. LEPs would require more extensive NEP rework, which would be assessed during the study phase and in conjunction with DOD. Prelimi-

nary discussions on such improvements to the W78 ICBM warhead are already underway with the Air Force, prior to entering its LEP study phase.

Accomplishing these improvements to the safety, security, and reliability of the stockpile without nuclear testing is understandably challenging and will integrate all of the tools developed under the stockpile stewardship to ensure success. In addition, understanding the overall enterprise capacity for design and production drives the time to achieve a stockpile with modern safety and security features. Optimizing the order and priority of weapons is an ongoing conversation between the NNSA and DOD communities and requires all participants for success. However, a modernized stockpile with improved safety, security, and reliability is achievable and should be actively pursued.

General ALSTON. Yes. The Air Force has established long-term goals with NNSA to incorporate enhanced surety features (safety, security, and use-control features) and reliability in life extension programs. Additional considerations include reduced maintenance workload, complexity, and cost. The use of alternative pits and major components, along with the possibility of reduced yield (which may be offset by increased accuracy) or other performance trade-offs would also be factors in planning for the long-term viability and reliability of the future nuclear deterrent stockpile, consistent with congressional direction and support.

Admiral JOHNSON. The Navy, in coordination with NNSA through the Project Officers Group, is evaluating options for maintaining the Navy's nuclear deterrent that include improving weapon safety, security, and reliability. For example, in coordination with the NNSA, the Navy, Air Force, and United Kingdom are working on a joint fuze effort to leverage technologies across Services. In addition, the Navy is coordinating with NNSA to look at safety and security technology applications in the planning and development of current and future Submarine Launched Ballistic Missile (SLBM) weapons.

COMPREHENSIVE TEST BAN TREATY

16. Senator BILL NELSON. Mr. D'Agostino, the United States has maintained nuclear weapons for 17 years without explosive nuclear weapons testing. As one lab director recently said, "we know how to do this." On the other hand, there are many experimental and computational tools, and skilled people needed to do this task. What is needed in the way of tools, people, and funding to continue to maintain the stockpile over the next 5 to 10 years without nuclear testing, and does the fiscal year 2010 budget support this? If not, why not, and what is missing or not funded?

Mr. D'AGOSTINO. The Stockpile Stewardship program has invested in improved experimental and simulation capabilities—e.g., Dual-axis Hydrodynamic Radiographic Test (DAHRT) facility, National Ignition Facility (NIF), and Advanced Simulatilon and Computing (ASC) tools—as key elements of a comprehensive science-based approach to the nuclear mission. Employing these capabilities is essential to deliver the robust, scientific underpinning needed to maintain the legacy stockpile over the coming decade. Additional resources would enable us to recapitalize major production facilities and enhance the science and engineering and Directed Stockpile Work needed to transform the stockpile to a smaller, more reliable deterrent without Underground Tests (UGTs). We incur more risk each year as the stockpile ages, critical skills erode, and historic UGT data becomes less relevant. The recent Perry Schlesinger Report indicates that in order to keep a vital skills base we will need to evolve the legacy stockpile by demonstrating capability to field modern warheads that have no new military capabilities. We have not fielded a modern warhead in two decades, and critical skills are deteriorating. Activities are needed now to ensure experienced designers and engineers can mentor a new generation. Additionally, the growing dependence on scientific understanding for the future stockpile will require additional experts in theory, experiments, and simulation.

Each year the NNSA evaluates its ability to accomplish its mission and prioritizes its work scope within available resources across a 5-year horizon. Our fiscal year 2010 request is sufficient to assure the safety and reliability of the current stockpile and sustain critical skills as we wait for the Nuclear Posture Review (NPR) to conclude and the national level direction to be provided for the future stockpile.

We anticipate that identified funding levels for the out-years may not be sufficient to meet the post-NPR stockpile requirements—including directed stockpile work, science-based stewardship, and recapitalization of NNSA's aging plutonium and highly-enriched uranium facilities—along with the requisite skills to be successful.

MAINTAINING CRITICAL SKILLS AT NNSA

17. Senator BILL NELSON. Mr. D'Agostino, maintaining critical skills throughout the NNSA complex is necessary to maintain a smaller stockpile in absence of nuclear weapons testing. This is not a new revelation but the Strategic Posture Commission (the Perry-Schlesinger Commission) has raised this issue again as one of their highest priority issues. What specifically is the NNSA plan to maintain these skills and transfer them to a next generation?

Mr. D'AGOSTINO. I am committed that the talents and facilities of the NNSA can and should be brought to bear on science and technology for the full complement of national security challenges. I am working to broaden the NNSA mission to become a science and technology arm for national security issues, a resource to which other agencies with national security responsibilities turn. By taking on the additional challenge of national security science and technology, we can provide the next generation of graduate students in science and engineering with exciting and relevant scientific challenges at premier research facilities such as Lawrence Livermore, Los Alamos, and Sandia National Laboratories, so that they may contribute to the security of our Nation.

In the absence of nuclear testing, the mission of the Defense Programs laboratories is focused on Science-Based Stockpile Stewardship. The success depends on the ability to show that simulations can credibly be used to replace nuclear testing as a means of ensuring stockpile confidence. Universities recognize the challenge in developing new kinds of simulation tools across a number of related disciplines to accomplish this mission.

Multitude of university collaboration programs are being conducted by NNSA that include establishing focused center of excellence at universities performing leading-edge research to graduate and undergraduate internships and summer institutes in various disciplines at the laboratories. In addition, NNSA funds fellowships, Research Centers of Excellence, Minority Serving Institution partnerships, post-doctoral appointments, and critical skills development programs. These activities not only engage academic communities in advanced research in areas of critical importance to NNSA but also maintain hiring pipelines from university graduates to the national laboratories. NNSA's investment in key critical skills pipeline programs exceeds $74 million annually.

NNSA also offers unique capabilities and facilities such as the Roadrunner, the world's fastest computer; National Ignition Facility, the most powerful laser in the world; the Microsystems Engineering Science Applications facility, a premier microelectronics facility; and the LANSCE, doing research that helps maintain the Nation's nuclear deterrent, counter the spread of weapons of mass destruction, and lay the foundation for many of the products we use in our daily lives by supporting materials, sciences, and technology. These are but a few of the capabilities and facilities that attract university researchers and in turn, universities develop cutting-edge simulation tools, experimental methods, et cetera that are critical to NNSA's mission. Specific examples of collaboration include the Advanced Simulation and Computing (ASC) Program's 10-year $220 million Academic Strategic Alliance Program (ASAP) (1997–2007) and the followup, 5-year $87 million Predictive Science Academic Alliance Program (PSAAP) (2008–2013); and the Science Campaign's Stockpile Stewardship Academic Alliances Program (SSAA). These programs engage multiple universities in the country and research conducted through these partnerships contributes to the knowledge base required to demonstrate the capabilities of predictive modeling and simulation across a broad spectrum of science and engineering applications using some of the most powerful computers in the world. The ASAP, PSAAP, and SSAA encourage collaboration between the national laboratories and universities in the advancement of multi-disciplinary predictive modeling and simulation technologies, and educating and recruiting individuals with skills critical to the Stockpile Stewardship Program.

STOCKPILE REDUCTIONS-STOCKPILE MIX

18. Senator BILL NELSON. Mr. D'Agostino, with the possibility of a smaller stockpile there is the possibility that there will be fewer types of nuclear weapons in the future. In preparation for the NPR, is NNSA looking at the technical feasibility of reducing the total number of weapons types and how technically feasible it is to reduce the number of redundant warheads? For example would it be possible to have an ICBM warhead serve as a backup for an SLBM warhead?

Mr. D'AGOSTINO. NNSA's Defense Programs is a force provider to the DOD and does not establish the mix of weapons or the stockpile quantities needed to support the mission. As an active participant in the DOD-led NPR, NNSA is assisting DOD

in assessing the nuclear weapons stockpile needs of the future. NNSA will be supporting DOD in the process to define options for force size and mix of weapons in the future stockpile. Currently, the operational environments of ICBMs and SLBMs differ significantly and no current warhead meets the requirements of both. The DOD would be the appropriate agency to determine if warfighting needs for such things as military targeting, weapon effects against targets, and military characteristics such as reliability and survivability could be met by having an ICBM warhead serve as a backup for an SLBM warhead.

19. Senator BILL NELSON. Mr. D'Agostino, would the overall stockpile be easier to maintain if there were fewer types of nuclear weapons, and if so, why?

Mr. D'AGOSTINO. While "easier" is subjective, there are sustainment advantages to having fewer types of nuclear weapons. Fewer warhead types would reduce the variety of surveillance and maintenance activities. Furthermore, it would reduce the number of life extension programs. Over the long-term, it would also reduce the diversity of weapons capabilities and expertise needed across the Nuclear Security Enterprise. Once the entire inventory of a particular weapon type is retired, NNSA could eliminate recurring activities and funding needed to support such efforts as maintenance, core surveillance, assessment, and other design and production support; however, NNSA will need continued funding for associated weapons experts, safety, surveillance, and dismantlement and disposition of weapon components until all activities associated with the retired weapon type are complete.

There are counterpoints to these advantages. Fewer weapons types will reduce the capabilities provided to the DOD. The DOD would have to respond regarding the impact this reduction of capability would have on mission effectiveness. For the NNSA, even though there are potential cost avoidances by reducing nuclear weapon types in the stockpile, there are also potential investments needed. For example, having multiple nuclear weapon types available for each weapon system in the triad does provide confidence that one technical failure will not completely negate one leg of the triad. By eliminating redundancy, the confidence in the reliability of each remaining system will be much more critical. Modernization of the stockpile and an even greater reliance on surveillance and the tools of Stockpile Stewardship will be essential to provide credibility of deterrence.

COMPUTATIONAL CAPABILITIES

20. Senator BILL NELSON. Mr. D'Agostino, the computational capabilities of all the labs have proved to be the real game changer for maintaining nuclear weapons in the absence of nuclear testing. As you move from two-dimensional modeling to three-dimensional modeling, is NNSA able to fund fully the code development and hardware needs of the stockpile stewardship program?

Mr. D'AGOSTINO. The NNSA Advanced Simulation and Computing (ASC) Program and DOE Office of Science's Advanced Scientific Computing Research have recently established a long-term collaboration and have charged a steering committee of laboratory technical experts to identify the impediments to exascale and strategies for overcoming them. Once the steering committee's analysis is properly vetted, we will understand the schedule and resources required to achieve exascale computing and move our trusted codes to this next generation of computing.

One of the greatest successes of the ASC program has been the successful addition of three-dimensional capability in the codes and the corresponding computer power to run highly resolved, three-dimensional calculations. So while many of the day-to-day calculations run in two dimensions for practical computing purposes, three-dimensional capability also exists to explore detailed weapons characteristics and explore scientific phenomena. Because of the grand challenge nature of the modeling and simulation in ASC, this will continue to be a balancing act for code development and hardware—as well as other aspects of the program.

For the near future, the ASC program is working to maintain expertise, utilize peer-review, and sustain healthy code teams to improve the scientific underpinnings of the codes and meet the simulation needs of the SSP for key applications. This will be supported by the Roadrunner, Zia, and Sequoia platforms slated to run these simulations.

QUESTIONS SUBMITTED BY SENATOR DAVID VITTER

NEXT GENERATION BOMBER

21. Senator VITTER. General Alston, 20 B–2s are the only long-range strike assets in the Air Force inventory that can access high threat environments and survive. These aircrafts have not been in production since 1997 and so there are no viable replacements to backfill losses. When a B–2 crashed in Guam in 2007, the Air Force lost 5 percent of its stealthy long-range strike fleet. The B–52 and B–1 have been upgraded numerous times to take advantage of new technology such as precision strike, global positioning systems, and targeting pods. However, stealth can never be incorporated into these aircrafts and they could remain vulnerable to attacks by surface-to-air missiles and fighters.

It is important to remember that in the final days of Vietnam, the Air Force lost 15 B–52s in 12 days during Operation Linebacker II. Air defenses have advanced markedly since then, but 47 percent of the long-range strike fleet is comprised of these same B–52s. While aircrafts such as the F–22 are certainly useful in certain scenarios, tactical strike assets require access to regional bases and forward deployed logistical support.

As recent events at Manas Air Base in Kyrgyzstan and K2 in Uzbekistan have illustrated, access to regional operating bases is becoming increasingly tenuous. Furthermore, potential adversaries have anti-access and area denial capabilities that could severely curtail operations at these forward bases. Taking all of this into consideration, what were the original Air Force recommendations in the Future Years Defense Program (FYDP) for the Next Generation Bomber?

General ALSTON. The Air Force manages Long Range Strike (LRS) capability through execution of its three-phase strategy: sustain and modernize the legacy bomber fleet, develop a mid-term LRS capability survivable in a high threat environment, and create a long-term solution using advanced technologies to generate revolutionary LRS capabilities. The existing bomber fleet, while aging, uses focused sustainment and modernization programs to maintain mission relevance, addressing issues with communications, navigation, electronic attack, and weapons delivery systems, as well as for integrating new weapons onto the B–52. While these aircraft do face survivability concerns against advanced air defenses, this can be mitigated by using complementary capabilities, such as standoff weapons. To address this, the Air Force has funded in fiscal year 2010 an Analysis of Alternatives (AOA) for a Long Range Standoff follow-on capability that will mitigate the high threat scenarios. America's bombers retain superior direct attack capability in lower threat environments. These continuing Air Force efforts ensure the bomber fleet continues to be a responsive, flexible, adaptive, and lethal platform able to support the Nation's LRS requirements.

Concerning the Next Generation Bomber (NGB), as part of its second phase, the Air Force was actively pursuing LRS capability to meet emerging operational requirements. One specific initiative within this effort, completed in 2007, was an AOA that identified the most promising of many possible aircraft designs. In April 2009, OSD cancelled the NGB program with Secretary Gates citing the need to better define the need, requirement, and technology required for this complex program. As a next step, the Air Force is fully committed to supporting and participating in the ongoing 2009 Quadrennial Defense Review (QDR) and accompanying NPR. After completion of the reviews, the Air Force will reevaluate its LRS strategy based on direction and findings from the reviews.

22. Senator VITTER. General Alston, what threat-based analysis changed this requirement?

General ALSTON. The decision to cancel the Next Generation Bomber was directed by the Secretary of Defense in the fiscal year 2010 budget submission until we have a better understanding of the need, the requirement, and the technology. The Air Force supports the QDR and NPR to assess future strategic requirements.

23. Senator VITTER. General Alston, stand-off weapons are key enablers for legacy bombers that are increasingly less survivable in defended air space. Conventional air launched cruise missiles (CALCM) comprise the majority of the Air Force's stand-off weaponry inventory, but recent comments by Air Force leaders suggest that these systems will not be viable over the long-run. This year's budget paused joint air to surface standoff missile (JASSM) acquisition, the replacement for CALCM. Why did this pause occur?

General ALSTON. JASSM went through Nunn-McCurdy certification in fiscal years 2007–2008 based on unit cost increases. Defense Acquisition Executive direction out

of Nunn-McCurdy was to test Lot 5 missiles prior to awarding the fiscal year 2009 contract. This test resulted in 6 successes out of 10 shots. Based on the test results, the program was paused to incorporate fixes identified during the Nunn-McCurdy certification, determine root causes of the failures on Lot 5, and incorporate necessary fixes on Lot 5, Lot 6, and Lot 7 missiles. With the delay of the Lot 8 award, fiscal year 2010 production money was removed.

24. Senator VITTER. General Alston, will the Air Force continue to invest in JASSM?

General ALSTON. Yes, the Air Force is committed to the JASSM program as it is the Nation's only stealthy, conventional, precision, launch-and-leave, standoff missile capable of being launched from fighter and bomber aircraft. As part of the Nunn-McCurdy certification, OSD certified the JASSM program's importance to Congress and stated that there are no alternatives to the JASSM program which will provide equal or greater military capability at less cost.

25. Senator VITTER. General Alston, is the Air Force investigating new technologies that enhance or supersede JASSM?

General ALSTON. Yes, the Air Force is investigating both enhancements to JASSM and technologies to supersede JASSM.

The Air Force is committed to the JASSM program as it is the Nation's only stealthy, conventional, precision, launch-and-leave, standoff missile capable of being launched from fighter and bomber aircraft. As part of the Nunn-McCurdy Certification effort, OSD certified the JASSM program's importance to Congress and stated that there are no alternatives to the JASSM program which will provide equal or greater military capability at less cost. Near-term enhancements to the baseline JASSM missile include extended range (ER) and Anti-Surface Warfare (ASuW) variants. Currently in development, JASSM–ER uses a different engine and larger fuel tanks to significantly increase standoff capability. In addition, the Air Force is investigating a JASSM/ASuW variant that would integrate a datalink onto the weapon and update JASSM software to enable attacking moving surface ships.

The Air Force, in conjunction with the Air Force Research Laboratory (AFRL) and other national laboratories, is constantly looking at the next level of technologies. The Air Force is researching technologies for higher survivability weapons, high speed (up to hypersonic) weapons, and directed energy but none are planned to be operational within the Future Years Defense Plan. One example is an Air Combat Command (ACC) coordinated effort working with AFRL on a Technologies for Responsive Precision Air Strike (TRESPAS)/Technologies for Responsive Precision Air-Land-Surface Strike (TRESPAL2) concept which will examine future technologies that can be developed to strike fixed and mobile targets with varying degrees of weapon effects.

[Whereupon, at 3:57 p.m., the subcommittee adjourned.]

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