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HEARING  
ON  
NATIONAL DEFENSE AUTHORIZATION ACT  
FOR FISCAL YEAR 2013  
AND  
OVERSIGHT OF PREVIOUSLY AUTHORIZED  
PROGRAMS  
BEFORE THE  
COMMITTEE ON ARMED SERVICES  
HOUSE OF REPRESENTATIVES  
ONE HUNDRED TWELFTH CONGRESS  
SECOND SESSION  
—  
SUBCOMMITTEE ON STRATEGIC FORCES HEARING  
ON  
**BUDGET REQUEST FOR  
NATIONAL SECURITY SPACE ACTIVITIES**  
—  
HEARING HELD  
MARCH 8, 2012



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**FISCAL YEAR 2013 NATIONAL DEFENSE AUTHORIZATION BUDGET REQUEST FOR NATIONAL SECURITY SPACE ACTIVITIES**

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HOUSE OF REPRESENTATIVES,  
COMMITTEE ON ARMED SERVICES,  
SUBCOMMITTEE ON STRATEGIC FORCES,  
*Washington, DC, Thursday, March 8, 2012.*

The subcommittee met, pursuant to call, at 1:30 p.m. in room 2212, Rayburn House Office Building, Hon. Michael R. Turner (chairman of the subcommittee) presiding.

**OPENING STATEMENT OF HON. MICHAEL TURNER, A REPRESENTATIVE FROM OHIO, CHAIRMAN, SUBCOMMITTEE ON STRATEGIC FORCES**

Mr. TURNER. By 1:30 if my ranking member has continued to be delayed, I will just break the rules and begin at that time, and I do know that she is on her way, but that way at least we can get started and get some of the statements on the record. So we will start at 1:30 in a moment.

[Brief recess.]

Mr. TURNER. All right. It is 1:30, we are going to go ahead and begin with just at least the process of receiving statements, and then if my ranking member has not at that point made it, we'll hold off on questions and recess, but we will at least go through the process of entering statements into the record, and I will begin with mine.

With that, good afternoon, and welcome to the Strategic Forces Subcommittee hearing on the fiscal year 2013 budget request for national security space activities. Our distinguished witnesses this afternoon are General William Shelton, Commander of Air Force Space Command; Ambassador Greg Schulte, Deputy Assistant Secretary of Defense for Space Policy; Mr. Gil Klinger, Deputy Assistant Secretary of Defense, Space and Intelligence Office; and Ms. Betty Sapp, Principal Deputy Director of the National Reconnaissance Office.

Thank you all for agreeing to appear before the subcommittee and for your service.

I would like to start by congratulating you on the significant accomplishments in the national security space over the past year. Due to tremendous efforts of the military, civilians, and contractors of the Department of Defense and Intelligence Community, we have a number of new critical capabilities in orbit. This could not have been accomplished without the launch team's efforts, which continued an impressive record of 49 out of 49 successful EELV [Evolved Expendable Launch Vehicle] launches.

The NRO [National Reconnaissance Office] has completed extremely aggressive and successful campaign of six launches in 7 months, and although we cannot talk here about the capabilities that the NRO brings to the fight, the warfighter, the Intelligence Community, and policymakers, they are all significant benefits from these launches.

While there have been great strides, this year's space hearing is especially important as we work to understand the significant reductions to the space program and its future impacts on national security. It is clear that space capabilities are an essential element of our military and intelligence construct. Space will continue to be a key enabler of our national security as the U.S. maintains the ability to operate in anti-access, anti-denial environments.

As such, in the new Defense Strategic Guidance, the President and Secretary of Defense listed the ability to operate effectively in space and cyberspace as a primary mission area of the U.S. Armed Forces, yet the fiscal year 2013 budget request for Department of Defense space programs was reduced by 22 percent from last year's request. I am concerned that a significant portion of these funding cuts are taken from research and development programs.

For example, the research and development in the evolved advanced extremely high frequency satellite communications program is reduced by over 75 percent. This investment is part of a broader space acquisition strategy started last year, formerly called evolutionary acquisition for space efficiency designed to reinvest savings from a block buy into a stable research and development program to lower risks for future programs.

Further, the Department proposed to terminate two programs that pushed the boundaries for small satellites and experimental payloads, the Space Test Program and the Operationally Responsive Space office. The Space Test Program has driven innovation from the benchtops of defense laboratories across the country to on-orbit space capabilities. Many space programs that we rely on daily, such as GPS [Global Positioning System], have their origins in the Space Test Program. I am not satisfied with the justification that has been provided for terminating the Space Test Program.

The Operationally Responsive Space office was established by Congress in the defense authorization process to address the need to rapidly reconstitute space capabilities under various threat scenarios and the desire to shorten the lengthy space acquisition cycle. The ORS [Operationally Responsive Space] office has responded to urgent warfighter needs and delivered critical capabilities. To date, I am not satisfied with the Department's plan to support this important mission after the proposed ORS termination.

I am pleased to see that the major spacecraft acquisition programs appear to be sufficiently funded in the budget request. Continued investment in core capabilities, such as GPS, AEHF [Advanced Extremely High Frequency], WGS [Wideband Global SATCOM], MUOS [Mobile User Objective System], and SBIRS [Space-Based Infrared System] cross multiple services in the Department. We must be conscious of the timing of our investments and properly align the schedules to deliver the spacecraft, ground segment, and user terminals in the most effective manner possible, consistent with the needs of the warfighter.

Assured access to space through our launch program remains another priority for this subcommittee. The price of launch has risen significantly in the past couple years, and the committee will continue close oversight as we work to understand the Air Force's new acquisition strategy for the EELV program. As General Shelton noted in his written testimony, this strategy will address industrial base viability and cost growth while making provisions to leverage emerging competition.

Further, as directed in our fiscal year 2012 National Defense Authorization Act, we look forward to the President's plan for a national rocket propulsion strategy that includes the Department of Defense, NASA [National Aeronautics and Space Administration], and Intelligence Community efforts. The GAO [U.S. Government Accountability Office] recently released a report on duplication that noted the space launch acquisition process for NASA and DOD [Department of Defense] duplicate one another and may not fully leverage the Government's investment.

In your opening testimonies we would appreciate hearing about collaboration in space launch activities across the Government to reduce duplication and leverage investments.

Regarding space policy, I support the Administration's decision not to sign on to the draft European Code of Conduct for outer space activities. However, I am concerned that the stated agreement, with elements of this code of conduct and intention to negotiate something similar, could establish the foundation for a future arms control regime that binds the United States without the approval of Congress, which would bypass the established constitutional processes by which the United States becomes bound by international law.

Additionally, I have significant policy and operational concerns with the EU [European Union] Code of Conduct with regard to our own national security. Earlier today, I received a written response from the Administration which was unsatisfactory and leaves no choice but to legislate in the National Defense Act. The letters that we received will be included as part of the record.

[The information referred to can be found in the Appendix on page 87.]

Lastly, as policymakers, we rely on the assessments provided by the National Air and Space Intelligence Center, NASIC, to understand foreign space threats. It is clear that as our dependency on space programs increases and threats continue to develop, our space situational awareness is critical, and the space constellation and ground network must be resilient.

NASIC is our first line of all-source intelligence analysis on space threats to form U.S. policy decisions. There are many aspects to this important area of national security, and we look forward to working together to reach enduring solutions.

Thank you again for the panel being with us today. You each possess a tremendous amount of expertise and you bring a tremendous amount of credibility also to the information that you provide us, as we look to our Nation's space policies and capabilities, and our Nation is better off because of all your services, and I greatly appreciate it.

[The prepared statement of Mr. Turner can be found in the Appendix on page 25.]

Mr. TURNER. With that, I would like to recognize and turn to my ranking member, Loretta Sanchez.

**STATEMENT OF HON. LORETTA SANCHEZ, A REPRESENTATIVE FROM CALIFORNIA, RANKING MEMBER, SUBCOMMITTEE ON STRATEGIC FORCES**

Ms. SANCHEZ. Thank you, Mr. Chairman. I am sorry for having been delayed in getting here. Part of the problem was my schedule said it was in 2118, so I walked into a BRAC hearing, quickly looked around, and said these are not my kind of people. No, just kidding. Missed you, Mr. Chairman, so I knew it couldn't be our meeting.

First of all, thank you, Chairman Turner, and I'd like to join the chairman in welcoming General Shelton, Ambassador Schulte, Mr. Klinger, and Principal Deputy Director Sapp to this hearing on the fiscal year 2013 budget request for national security space activities. Thank you all again for your service to our country and for appearing before our committee. Again, I apologize for my delay.

Our military superiority and way of life depend on space assets for secure communication, navigation, missile warning, weather prediction, intelligence, surveillance, reconnaissance, so many things. And as we all know, space has become increasingly congested, contested, and competitive.

Our first priority remains to ensure that we preserve and protect our space assets in an increasingly fragile environment, and in this context, quite the opposite of my chairman here, I am encouraged that the Administration has announced plans to at least enter into an international discussion on the Code of Conduct for Space, one, of course, that would meet U.S. requirements and establishes a norm of recognized responsible behavior.

It becomes increasingly necessary to promote and to protect the peaceful use of space as additional countries gain access to space. And as you know, that is one of the areas over the years that I have been really cognizant of, not weaponizing space or not doing an arms race in space.

Second, the challenge of protecting our advantage in space is all the more difficult in a fiscally constrained budget environment. And under the Budget Control Act, we must get our fiscal house in order, and we have got to do a lot more with a lot less.

Reducing costs in the satellite and launch business, while preserving mission assurance, presents unique challenges. So I know you all have been working very hard on this, and I thank you for your contributions in working towards getting this under control.

I am pleased that we have made progress in reducing costs through a block-buy, fixed-price contract approach for acquisition and driving toward increased competition in launch. However, using commercially available technology and services and improving synchronization between the procurement of satellites and corresponding ground station capabilities remain important opportunities to drive down the costs and to maximize our efficiency. And, sustaining efficient acquisitions and operations requires facilitating the development and the testing of these new technologies.



I am concerned that the Space Test Program, which was crucial to the development of GPS and several key communications satellites in the military that our military relies on today, has been canceled. So, I would like you to speak to that a bit.

And, last, I would also like to hear your thoughts about preserving the space industrial base to protect needed satellites, ground capability, software and launch vehicles. The required and much delayed 1248 report will provide important analysis to reform expert control regulation. Progress in this area will help U.S. industry be more competitive while balancing the need to protect sensitive technology. But, we must also always look at the risks to our industrial base of updating overly restrictive export control regulations.

So, I look forward to your testimony on these important budget issues, and again I thank you for being before us today, and I yield back, Mr. Chairman.

Mr. TURNER. Thank you. We will begin now with oral statements as a summary to the written statements. I will ask that each of the panel members limit their comments to a 5-minute period.

And, we will begin with General Shelton.

**STATEMENT OF GEN WILLIAM L. SHELTON, USAF,  
COMMANDER, AIR FORCE SPACE COMMAND**

General SHELTON. Mr. Chairman, Representative Sanchez, and distinguished members of the subcommittee, it's an honor to appear before you today as the commander of Air Force Space Command. It's also my privilege to appear before you alongside these colleagues from the national security space business.

In line with the recently released Department of Defense Strategic Guidance, the men and women of Air Force Space Command protect our national interests by maintaining a singular focus, and that is providing vital space and cyberspace capabilities to the warfighter and to our Nation. Assured access to space and cyberspace is foundational to the conduct of military operations and is crucial to the Nation's ability to project power in areas in which our access and freedom to operate are challenged.

Accordingly, the fiscal year 2013 President's budget invests in programs that enhance the resiliency and effectiveness of our space capabilities; namely, missile warning, positioning navigation and timing, satellite communications, space situational awareness, and space launch.

There is an overall reduction in funding levels in the space budget, but that is primarily due to fact-of-life programmatic changes. First, several programs will ramp down developmental activity as they transition to procurement, and this is a good news story. Second, Congress funded two wideband global satellites in fiscal year 2012, so there is no need to fund a satellite in this year's budget. And, third, there is no longer funding for the Defense Weather Satellite System since this program was canceled in the Fiscal Year 2012 Appropriations Act.

In addition to these fact-of-life changes, we made some very difficult budget decisions, leading to cuts to some modernization programs and restructuring our approach to Operationally Responsive Space and space tests.

We are also pursuing acquisition efficiencies through the efficient space procurement actions for the Advanced Extremely High Frequency program and the Space-Based Infrared System.

Finally, we remain committed to working closely with our partners in the National Reconnaissance Office and the National Aeronautics and Space Administration to bring stability and predictability to our launch programs.

I thank the committee for your continued and steadfast support of Air Force Space Command and national security space programs, and I look forward to your questions. Thank you, Mr. Chairman.

[The prepared statement of General Shelton can be found in the Appendix on page 28.]

Mr. TURNER. Thank you. Mr. Schulte.

**STATEMENT OF AMB. GREGORY L. SCHULTE, DEPUTY  
ASSISTANT SECRETARY OF DEFENSE, SPACE POLICY**

Mr. SCHULTE. Chairman Turner, Ranking Member Sanchez, subcommittee members, thank you for the opportunity to testify. When I testified here 1 year ago, the Secretary of Defense and the Director of National Intelligence had just issued the first ever National Security Space Strategy. That strategy aims to protect the advantages we derive from a domain that is increasingly congested, contested, and competitive.

DOD's new strategic guidance was informed by our space strategy and reinforces its key tenets. Both documents stress the importance of operating effectively in space, promoting responsible behavior, operating when possible with coalition and allied forces, and increasing the resilience of our space-based capabilities.

I'd like to touch briefly on three important aspects of the space strategy.

First, the National Security Space Strategy and the new Defense Guidance both stress the need for resilience in our space capabilities in response to emerging anti-access area denial challenges. Resilience contributes to deterrence of attacks on our space assets. Resilience also enables us to continue vital missions, even in a degraded space environment. Resilience is not the property of a single system. Rather, it is the ability of the whole architecture to provide functional capabilities necessary for mission success despite environmental adversity or hostile action. Resiliency can be achieved in a variety of ways. Examples include hosted payloads, commercial augmentation, international cooperation, and backup capabilities in other domains.

Promoting responsible behavior in space is a second key aspect of our strategy. The Department of Defense is playing the leadership role, including by providing countries and companies across the globe with warnings of potential collisions in space. We support the State Department's efforts to work with the European Union and other spacefaring countries to develop an international code of conduct for space activities. A widely subscribed code can encourage responsible space behavior and single out those who act otherwise, while reducing risk of misunderstanding and misconduct.

The EU's draft is a promising basis for an international code. It focuses on reducing the risk of creating debris and increasing transparency of space operations. It is not legally binding and rec-

ognizes the inherent right of self-defense. It addresses behavior rather than unverifiable capabilities, and better serves our interests than the legally binding ban on space weapons proposed by others.

As we participate in the development of an international code, the Department is committed to ensuring that it advances our national security. We are also committed to answering your questions and keeping you informed.

Energizing our space industrial base is a third key aspect of our new strategy. We can help energize our industrial base by allowing U.S. industry to compete internationally for the sale of satellites and technologies that are already widely available.

Last year, the Department of Defense and the State Department provided an interim assessment of space export controls. That assessment concluded that commercial communication satellites and related components, with a few exceptions, can be moved from the U.S. munitions list to the commerce control list without posing an unacceptable security risk. The forthcoming final report will identify additional items that we believe could be safely moved.

Indeed, moving widely available items off the munitions list will allow the Government to focus its controls and enforcement on those technologies that are most sensitive and most critical to our national security.

This approach, higher fences around fewer items, will require new legislation. Your support can help energize our industrial base and thereby enhance our national security. Giving our industrial base new commercial opportunities is particularly important at a time of defense spending constraints.

In conclusion, the Department continues to implement the National Security Space Strategy. We need your support to deploy necessary capabilities, increase their resilience, and protect the industrial base so important to our national security. Thank you.

[The prepared statement of Mr. Schulte can be found in the Appendix on page 56.]

Mr. TURNER. Mr. Klinger.

**STATEMENT OF GIL I. KLINGER, DEPUTY ASSISTANT  
SECRETARY OF DEFENSE, SPACE AND INTELLIGENCE**

Mr. KLINGER. Thank you. Mr. Chairman, Ranking Member Sanchez, and members of the subcommittee, it is my pleasure to be before you today. It's also my pleasure to be part of this distinguished panel representing the spectrum of disciplines that are key to ensuring the success of our space acquisition programs.

Chairman Turner, you already outlined the number of successful launches we have had in recent years. I would just echo some of the points that you made that these successes reflect the combined efforts of a Government and industry team which has significantly improved and modernized our space capabilities across all mission areas. The support of Congress has been instrumental in achieving all of these successes.

The environment in which we operate continues to evolve and transform. This transition has rippled through our space acquisition system, which historically focused on performance-driven, edge

of technology and engineering capacity. We consistently look to push the edge of the art and science of the possible.

Acquisition of space capabilities frequently and consistently had a first and often unfettered call on the resources of the Defense Department and Intelligence Community as compared to many other capability areas. We simply no longer have this luxury. Space capabilities are now integrated and inextricably bound up in the nervous system of U.S. military forces and intelligence capabilities. Often, maintenance and continuity of service have become as or more important than pushing the envelope to achieve new performance capabilities. In fact, many of our space capabilities have become the dial tone of national security, and like the dial tone of our telephones, we take their availability and presence for granted, noticing only when there is an unplanned service interruption. This reality places a special responsibility on those of us who work in space acquisition to improve the timelines of delivery of new capabilities.

We also must focus on ensuring our space architectures are sufficiently robust and resilient to operate through natural and man-made threats. To ensure our dial tone is uninterrupted, we are recapitalizing virtually all of our space lines of business, and doing so at precisely a time of sharply constrained resources and as the Nation remains at war.

Here are some of the things that we are doing. We are putting greater scrutiny on executing oversight earlier in the acquisition process so program managers can achieve authority to proceed early and then focus their energies on program execution rather than coming back to respond to oversight that has more limited value.

We are using fixed-price contracts, more innovative contracting, and evolutionary upgrades where those make sense. As only one example, by taking advantage of a maturing production line and risks that have been well-managed and retired from other programs, we are incorporating contract restructures into our GPS III and Advanced EHF-5 and -6 satellite programs. We are pursuing a block-buy for Advanced EHF-5 and -6 and developing a plan to use the savings to improve the capability of military satellite communications overall.

In GPS III we're modifying the acquisition strategy from a cost-plus to a fixed-price contract. The Air Force is also modifying its approach to the follow-on to the first block of GPS III by providing on-ramps to add capabilities when mature and affordable. This is extremely important as we plan ahead to maintain the resources to protect our seed corn of promising technologies.

We intend to use competition where and when it makes sense: when the United States Government has a firm and stable understanding of its requirements; when there is more than one industrial vendor with domain knowledge of the capability that we seek to acquire; and when the calculated benefits of the competition outweigh the inevitable costs that sometimes accrue.

We are stressing affordability even in our ongoing programs. We are stressing with our industrial partners to place as much emphasis on engineering for cost control and affordability as we have historically placed on engineering for performance. Let me repeat

that. We must place as much emphasis on engineering for cost control and affordability as we have historically placed on engineering for performance. For us, this is no longer a question of can we do something. The question before us now is, how well do we have to do something and the proportionality or the degree to which we must do it. This is a fundamentally different business model for many of us in the space acquisition community. At the same time, we must maintain essential industrial capacity and acquisition program stability and evaluate the opportunities to leverage commercial partnerships where prudent.

Thank you for the opportunity to present the Department's efforts to achieve a balanced space acquisition process while protecting the stewardship of our resources, and I look forward to answering your questions.

[The prepared statement of Mr. Klinger can be found in the Appendix on page 66.]

Mr. TURNER. Thank you. Ms. Sapp.

**STATEMENT OF BETTY J. SAPP, PRINCIPAL DEPUTY  
DIRECTOR, NATIONAL RECONNAISSANCE OFFICE**

Ms. SAPP. Chairman Turner, Ranking Member Sanchez, and distinguished members of the subcommittee, thank you for the opportunity to be here today. On behalf of Director Carlson, it is my pleasure to appear alongside our mission partners from the Department of Defense to discuss national security space activities.

I'd like to start with a few words about the state of the NRO today. As Chairman Turner mentioned, last year with our Air Force mission partners, we executed the most aggressive launch campaign in more than 25 years at the NRO, launching six satellites in 7 months. This year with the same determination, the same strong partnership with the Air Force launch community, we will launch 4 satellites in 5 months.

Delivering programs on cost and schedule is a matter of critical importance to our national security. It is a part of keeping our faith with the warfighters in terms of meeting our commitments. Evolutionary acquisition practices have been used successfully for decades by the NRO. Those have helped us meet those acquisition commitments. They've been fundamental to reaching an all green scorecard for NRO acquisition. Yes, today, every single NRO acquisition program is green for cost, schedule, and performance.

The NRO financial system is also sound. The best evidence of this is that for the third year in a row we have sustained a clean audit opinion from an outside independent auditor. We are also proud of what we do to support our troops in the field.

Although the specifics of much of what we do cannot be discussed in this forum, I can tell you that the NRO has developed and deployed more than 25 reference emitters, which have since been used more than 13,000 times. These emitters have greatly improved the capability of CENTCOM, for example, to precisely geolocate threats, allowing U.S. and coalition military forces to be extremely precise in targeting those threats.

We not only design and deploy systems to support our troops, but also help to train the troops to use them effectively as they go off in harm's way. The men and women of the NRO stationed around

the globe strive to make a difference for the troops every single day.

Mr. Chairman and members of the committee, thank you for the opportunity to appear before you today. Again, on behalf of General Carlson, I thank you for your continued support of the NRO, and I stand ready to answer any of your questions. Thank you.

[The prepared statement of Ms. Sapp can be found in the Appendix on page 75.]

Mr. TURNER. Alright. Thank you so much.

General Shelton, thank you again for your being a champion of protection of our defense access to GPS. Last year Congress enacted a provision that prohibited the Federal Communications Commission, FCC, from giving the commercial company LightSquared the authority to proceed on its proposed network until the FCC resolved concerns about widespread harmful interference with GPS receivers of the Department of Defense. On February 14th the FCC issued a statement that concluded that there is no practical way to mitigate potential interference at this time. The Commission is waiting on a response from LightSquared. General Shelton, is this an isolated matter or are there further steps needed to ensure DOD'S spectrum continues to be safeguarded in the future?

General SHELTON. Mr. Chairman, first, thank you and the members of this committee for your help in protecting that part of the spectrum that GPS depends upon. As we go forward—this is, again, a physics problem—that part of the spectrum has to be protected. Whether that is by policy within the FCC, whether that is by legislation, there is no question that we have to protect that part of the spectrum.

Mr. TURNER. Good, thank you. The Space Test Program has been a national capability since 1965. The program is designed to allow engineers and scientists and defense laboratories and universities to focus on developing leading-edge, state-of-the-art capabilities while the Space Test Program initiates and delivers these payloads to orbit. To quote the program office, "Most DOD space systems flying today started as STP experiments or were directly impacted by STP experiments."

General Shelton, considering the value that this program has provided, can you please explain why the program was canceled and what the long-term impacts are.

And, Mr. Klinger, to account for the STP termination, are the budgets for the laboratories across the Department being increased to account for the expanded mission of launching their payloads? General.

General SHELTON. Mr. Chairman, as we looked at the range of things that we do across the space portfolio, and we were asked to contribute certainly our share of the \$487 billion reduction as part of the Budget Control Act, Space Test Program came up as one of the things that we might be able to take risk in. The reason for that is we have much space research going on in the Air Force Research Laboratory. In fact, we have about \$370 million in fiscal year 2012 being spent in the Air Force Research Lab for space-related things.

We also have space-related research going on in Defense Advanced Research Projects Agency, DARPA. We also have space research going on in the Naval Research Lab. There is also work going on inside the Army. As we looked at that across the board, we felt like this was a place where we could take risk and we had to contribute, again, our fair share as part of the resource draw-down.

Mr. TURNER. Mr. Klinger.

Mr. KLINGER. Mr. Chairman, to follow up on General Shelton's points, there's a diversified portfolio of space research capabilities going on across the laboratory system in the Department of Defense. If I may, I would like to take for the record your question and get back to you with the specific dollar figures so I can give you a more accurate answer and picture of the situation.

Mr. TURNER. That will be fine. However, our experience with questions for the record is that they take a tremendous amount of time for a response. I would hope that you would be able to provide a quick response to that since we are hoping to get one in the hearing.

Mr. KLINGER. We will do that.

Mr. TURNER. Thank you.

General Shelton, I have a memorandum that I believe you are being provided that is dated December 30, 2011, that states that you are interested in the Missile Defense's Precision Tracking Space System space situational awareness possibilities. And, this is possibly 24 satellite low-earth orbit constellation, and I would like if you could speak for a moment about the space situational awareness benefits perhaps of the Precision Tracking Space System that the Missile Defense Agency is looking at. And, I also want to inform you that General O'Reilly, just in a hearing that we had Tuesday, when we inquired to him about this, asked whether or not, you know, he would be working directly with you in coordinating this, he said, "Yes, sir, and that is how I responded back to General Shelton, exactly that way." Although it was encouraging to me, I want to ensure that these two systems, two programs, and certainly our two generals are able to coordinate. So if you could please comment on that.

General SHELTON. Mr. Chairman, there is an exciting possibility here if we go forward with the PTSS [Precision Tracking Space System] program. That will fly, again, some number of satellites yet to be determined, but up to 24. Looking from an equatorial inclination, up above the Earth and not only will it be able, because it is an infrared sensor, not only will it be able to see missile launches and very accurately report on those, but it will also be able to see things flying in space. A wonderful space situational awareness sensor, and lots of them in space.

So, if we can cooperate with the Missile Defense Agency, if it takes a nickel more, so to speak, to get that capability on PTSS, or maybe even you get it for free because of the inherent capability, we just want to make sure that that's a design parameter that is included to the maximum extent possible. We don't want to drive them into a cost position that they don't want to be in, but we do want to do everything we can to make it an affordable capability as part of the inherent capability in the system.

Mr. TURNER. I am not going to ask necessarily did General O'Reilly say yes, sir, in response to your memo as he said, but have you received a response to the memo that is satisfactory? Do you believe that General O'Reilly and the Missile Defense Agency will be responding to what clearly is a very important issue that you have raised?

General SHELTON. I do, Mr. Chairman. I did get a response, and it is about a three paragraph response but, summarized, said, yes, sir.

Mr. TURNER. Excellent, excellent. Turning now to my ranking member, Ms. Sanchez.

Ms. SANCHEZ. Okay.

General Shelton, Mr. Klinger, Ambassador Schulte, as you know, section 1248 of the fiscal year 2010 National Defense Authorization Act directed the Secretary of Defense and the Secretary of State to carry out an assessment of the national security risks of removing satellites and related components of the United States munitions list. That report is now almost 2 years late.

In the meantime, the U.S. satellite industry, the industrial base continues to struggle to keep pace with the global competition in what is intensely really an international market. So, a study on the health of the space industrial base entitled "U.S. Industrial Base Analysis for Space Systems," conducted by the Tauri Group under contract to OSD industrial policy, cites 11 space technologies of high risk due to the absence of U.S. suppliers or a single U.S. supplier. Prudent changes to overly restrictive export control regulations could have a significant impact on the health and the sustainability of our United States satellite industry.

So, can you tell me again when the section 1248 report will be delivered and do you think that there will be significant movement in our ability to actually get some export going so that we can hold onto our lead in this industry?

Mr. SCHULTE. Representative Sanchez, we share your concern about the industrial base, and we are—part of the strategy that we have, a key part of it is to energize that industrial base, and there are ways you can do that through what you buy and how you buy it. And Gil Klinger, Mr. Klinger, has talked about that a little bit, but we also believe that space export control reform has to be a key part of how we energize our industrial base to allow our industry to compete on the international market in the sale of items and technologies that are already widely available and therefore would not hurt our national security. So, we support export control reform that would allow that to proceed. We will need your help in that regard.

We issued the—yes, ma'am, we are late on the 1248 report, perhaps even later than we are sometimes on QFRs. I apologize. We had the initial 1248 report come out last year, and in that report we indicated a judgment by the Department of Defense and Department of State that commercial satellites and their components, with a couple of exceptions, could, in fact, be moved off of the U.S. munitions list. We owe you the final report, which is forthcoming, and we anticipate that that final report will indicate other items in what we call category 15, the space items, that can be moved off of the munitions list onto the commerce control list. For that to



actually happen, it does require legislation. Unlike in any other industry area, this is one where the export control is legislated, so we will need your help in that regard.

But our goal is to allow, with your support, is to allow industry to be competitive on the international market in areas where technology is already widely available, and then concentrate our controls, our licensing, and our enforcement on those technologies that are truly sensitive, and by building higher fences around higher walls, we think—I am sorry, higher fences around fewer items—we think we can accomplish two things: help our industry and thereby help our national security.

Ms. SANCHEZ. So when you say “forthcoming,” what does that mean?

Mr. SCHULTE. Oh, ma’am, I would like to tell you it is next week. It is in coordination at this point. Hopefully it will be here soon.

Ms. SANCHEZ. So forthcoming and it will be here soon; what does that mean, Ambassador? Can I expect it in a month, 2 months, 6 months, 2 years, 4 years?

Mr. SCHULTE. I would hope closer to the first part of that range. Our goal is to get it to you as soon as we can. I should just say, if I may, it’s taken longer than anticipated in part because we have had to survey all of the items in category 15 and, believe it or not, there are hundreds of thousands of items in category 15. So it has required a very thorough scrub to make sure that we are presenting the best possible assessment to you, but we do hope that report will come to you very soon.

Ms. SANCHEZ. Great, we’d like to see it. I know that our ranking member, Mr. Smith, is very interested in this also, and I think that he or I would carry legislation to allow some of this to happen. I know that he and I were the only ones many, many years ago when I think it was maybe our first or second year on this committee, and we came in together, where we had the encryption fights and he and I were, I think, the only votes to try to loosen up some of that encryption because, you know, coming from States like Washington and California where this is predominant, we lose our ability to compete if we don’t have a market for what we’re making. Or, if we have an artificial market because we are only supplying to our companies or to our defense system, we are still losing our creative and competitive and innovative edge. So, I really believe that this is a very important issue, and I am sure—I don’t want to speak for Mr. Smith because he is not in this hearing—but, I know the fight we had many, many years ago on encryption, and I believe he feels the same way about this, that there are some things that we can make a market for by export that is already out there or the equivalent, and we would like to see that be a priority.

I want to go back to the EU Code of Conduct. Ambassador, you know, there is a real, I don’t want to say fear, but there’s definitely different ideas of what sitting down and negotiating on this code of conduct is about. Can you talk a little to the—maybe to the cost and the benefits of entering into negotiations with the EU on the EU Code of Conduct, and what are the risks that we run of not doing something like that? And, will our military operations and needs be protected?

Mr. SCHULTE. Ma'am, we judge that a code of conduct, not the EU code per se, but a code of conduct can actually serve the interests of our national security and strengthen our security. We asked the joint staff to conduct an operations assessment of the existing EU draft, and then based upon that assessment we came up with a mitigation strategy that included some changes to the code, a subscription statement if we subscribe at some point, and some internal guidance that in our judgment would make sure that a code would be fully supportive of our national security.

We have briefed the operation assessment and the mitigation strategy in detail to your staff. But we judge, you know, the State Department, we will be there with the State Department in those negotiations, and before a code is finally adopted or agreed to, we will conduct another full operations assessment with mitigation strategy to make sure it is acceptable to us.

Some of the concerns we have heard about the code, and they are all legitimate, and we have tried to address them. One concern is, is this arms control by the back door? This is not arms control. I mean, this is a voluntary code. It is not legally binding. In fact, one advantage to the code is right now Russia and China have been proposing a legally binding arms control agreement that we don't think would serve our national interests, and this allows us to change the narrative in the international discussions, and it takes us off effectively the defensive, and it has us talking about how do we promote responsible behavior.

Another concern that has been raised about the code is could it somehow limit our missile defense capabilities, particularly if we wanted to put some in space? And the answer to that is no. The code specifically focuses on behavior, not unverifiable capabilities. So we have been very careful to make sure that it is in line with our practices, it is in line with our planning, and it would support our national security.

If I could, just briefly: one of the benefits is changing the narrative. Another benefit is to encourage all the new entrants into the space field to act responsibly, to follow the type of procedures we do and make sure they don't create the debris or they don't operate matters that risk misunderstanding, again with the objective of helping to protect space, which effectively is part of the global commons.

Ms. SANCHEZ. Mr. Chairman, I have a lot more questions, but I'll—

Mr. TURNER. We will do a second round of questions.

Ms. SANCHEZ. Thank you.

Mr. TURNER. Mr. Heinrich.

Mr. HEINRICH. Thank you, Chairman. General Shelton and Mr. Klinger, I am deeply concerned about the budgetary cuts to small satellite programs such as Operationally Responsive Space and the Space Test Program in fiscal year 2013. These relatively small satellite programs require marginal investments, and given the increasingly competitive environment in space and the high cost of procuring traditional multibillion-dollar satellites, I fear they are penny-wise and pound-foolish cuts.

It makes no sense to me that the Department, in an attempt to lower costs, has proposed terminating a program whose whole pur-

pose was to lower cost. Specifically, the Department's proposed fiscal year 2013 budget calls for the "... restructure of Operationally Responsive Space, ORS, program in order to provide more responsive and timely space capabilities to the warfighter," yet the ORS program was terminated.

Can you please explain to me why this program is being canceled, what plans the Air Force has to sustain the ORS mission, and how it intends to provide more responsive and timely space capabilities to the warfighter without the ORS mission and funding?

General SHELTON. Yes, sir. First point I would make is that the concept of ORS is not going away. It is continuing, but it is continuing across our programs. As opposed to having a dedicated program office that is going to work ORS and produce individual satellites, we will have ORS concepts spread across all of our satellite programs, and I think you will see those concepts come out in the future as we look at alternative architectures and things like that.

There are people still working at Kirtland Air Force Base, working together just like they have been on ORS concepts. The space development and test division that's there will continue to work ORS concepts on behalf of all of the Space and Missile Systems Center, which is headquartered in Los Angeles. So that linkage, which has always been tight, will continue. It is just that we won't have a dedicated office.

As we looked, again, across our entire portfolio, and we had to come up with these Budget Control Act reductions, this was one of the victims of the Budget Control Act reductions. But, at the same time, the concept still continues to live. So, I think it is a win-win, given the environment.

Mr. HEINRICH. General, as you know, the ORS imaging satellite was launched in June of 2011 in response to a requirement in support of U.S. Central Command. It is my understanding that ORS-1 has met and exceeded CENTCOM's [U.S. Central Command] expectations.

Can you speak a little more on what the warfighter's response has been to this reconnaissance asset?

General SHELTON. Yes, sir. We got a letter from their intelligence officer, basically their J2, that said they were extremely impressed with the imagery that they had gotten from ORS-1. They were not only happy with the responsiveness of it, but they were happy with the quality of the imagery that they were getting, and it was a warfighting advantage, no question.

Mr. HEINRICH. I want to quickly reiterate Chairman Turner's concerns about the Space Test Program and sort of follow up with a follow-up question to the ones that he raised.

Did the Air Force coordinate with the affected Government laboratories and organizations that have also benefited from this program over the years, so that they could properly plan for the change in fiscal year 2013 budget request?

General SHELTON. I think that the coordination that maybe we would have wanted to occur did not occur, and the reason for that was as we got to the final balancing at the end of the President's budget exercise, we flat just didn't have the time, plus there was a lot of closed-door sessions that finalized that submission. That coordination is going on now. We are determining how we will spread

the work. We are determining how we will gain the same sorts of advantages we got from the Space Test Program, albeit by other organizations.

Mr. HEINRICH. That was not exactly the answer I was hoping for, but Mr. Chairman, I will yield back to you.

Mr. TURNER. We are going for a second round, and I have got a couple questions. This one is to General Shelton and Ms. Sapp. On December 20th, Chairman Ros-Lehtinen, Chairman Wolf, and I wrote to the Secretary of State inquiring about the status of a pending investigation of the suspected illegal export of commercial satellite technology to China. I will read you the first paragraph of the letter to give you some reference.

We write to Secretary Clinton stating that “. . . we seek your prompt response on a matter of continuing concern of ours, efforts to protect the United States from the increasingly aggressive activity in space of the People's Republic of China. One important and often overlooked part of the U.S. capacity to ensure our security in space is the export control regime, specifically the International Traffic in Arms Regulation, ITAR, which is the responsibility of the Department of State. We are concerned that the Department is not moving aggressively enough to punish violations of this regime.”

Are the two of you familiar with this letter?

General SHELTON. I have seen the letter, yes, sir.

Mr. TURNER. Good. What I would like to know is, are you familiar with the State Department position that the Department is further—excuse me, are you familiar with the State Department's position that “. . . the Department is further troubled by the perception of Thales' continued lack of cooperation, particularly given the SB-4000 C2 was not, in fact, ITAR-free and was exported to China; and can China's counterspace programs benefit from U.S. technology and we not make certain that China isn't able to obtain that technology”?

If you would give me your thoughts on both the letter and the issue of exporting in violation of ITAR, what that means to the Chinese systems.

General SHELTON. All I was going to say is I'm, really not as familiar with the issue. I am familiar with the letter, but, Mr. Chairman, I couldn't really comment on the details of the issue.

Ms. SAPP. I am afraid I could not as well. I have seen the letter, but I am not familiar with what has been done in response.

Mr. TURNER. Can I ask if both of you, upon reading the letter, had concerns about the circumstances that were laid, set out in the letter?

General SHELTON. Certainly anything that would offer a comparative advantage would be of concern.

Mr. TURNER. Ambassador, you were raising your hand, so I will call on you.

Mr. SCHULTE. If that is okay, sir. I am familiar with the letter, and we know that the State Department is investigating that case. But, the leakage of sensitive technology to countries like China has, of course, been foremost in our mind as we thought about export control reform, and so in the 1248 reports that we are providing you, the Department of State and Department of Defense are proposing moving from the munitions list to the commerce con-

trol list only space items that are already widely available; and we are not proposing removing the Tiananmen Square sanctions that would remain in place even with export control reform, meaning that items still on the munitions list could not be exported to China and also meaning that we would not allow the launch of satellites from Chinese launch vehicles.

Finally, we have also proposed, the Administration has also proposed in the case of China for those items moved off the munitions list that we still have restrictive licensing and export controls on those. So, we are very conscious of China, and we have developed our export control proposals with China very much in mind. In fact, we believe that to the extent that we focus on those technologies that are most sensitive, we can increase the focus of our export control and enforcement efforts to avoid situations like this in the future.

Mr. TURNER. Well, tell me about the statement of the State Department's position, "The Department is further troubled by the perception of Thales' continued lack of cooperation, given that the export was, in fact, not ITAR-free, and was exported to China."

You are in a situation where an export appears to be in violation, and you are not getting a whole lot of cooperation, it appears. Tell me what the State Department is currently doing and your thoughts then on that matter.

Mr. SCHULTE. Sir, despite being an Ambassador, I shouldn't try to talk for the State Department. I know that they have come, Frank Rose, my colleague there, has come to brief your staff, but we're clearly concerned at any leakage of sensitive technology to China, and support all enforcement efforts there.

Mr. TURNER. Well, Ambassador, let's turn to the issue now of the code of conduct. I obviously have constitutional concerns. The whole purpose in the Constitution of having Senate confirmation is that so one individual would never have the ability, power, or authority to internationally bind us by law that would in any way restrict our rulemaking, our lawmaking.

The code of conduct, as I understand it, would, although perhaps be proposed as nonbinding, in fact would have regulations that would be promulgated and would, in fact, restrict activities that the United States is doing. So, there are serious concerns that people have with respect to a back door.

So, my first question is, if Russia and China don't join, since those are two of the states most capable of generating debris in outer space, what have we accomplished? And, isn't it true that one of the reasons China didn't test an ASAT [Anti-Satellite weapon] again after 2007, the one that created all the debris, was that the international outcry was so great that it didn't want to risk that again, meaning that there was an effect upon Chinese behavior, and in 2007 there was no code of conduct. So, your thoughts on Russia and China?

Mr. SCHULTE. Sir, I was actually in Vienna working with the Committee on the Peaceful Uses of Outer Space when the Chinese tested, and the Chinese Ambassador, who is my colleague, was clearly embarrassed and had no talking points for about a week after that happened.

That said, the Chinese continue to develop a very broad range of counter space capabilities, including ones that could cause debris. They've tested additional systems but in a way that has minimized debris. Our concern is that there are more and more countries, including China, that are developing space capabilities, and to protect the long-term sustainability of space we think that a code, not the EU's current code, but that a code, if properly negotiated and if we evaluate it and agree it's acceptable, can actually help to protect the long-term stability of space by encouraging responsibility—

Mr. TURNER. Let's stop there for a second. I love the fact that you use the words "properly negotiated."

Mr. SCHULTE. Right.

Mr. TURNER. Please tell me why that would not involve the Senate.

Mr. SCHULTE. A code of—sir, a code of conduct is a voluntary code. An example of that, for example, is The Hague Code of Conduct, which was negotiated by the last administration and subscribed to by them.

Mr. TURNER. Actually, let's discuss that because you have used that as an example before. You've pointed to The Hague Code of Conduct against ballistic missile proliferation to suggest that the Bush administration favored this nonbinding approach and therefore that it must be fine. You measure the goodness of the policy on whether the Bush administration favored it as a course of action, and I am confused. The joint staff analysis we have states that if the United States were to make a good-faith effort at implementing the requirements of such a code, your code, the one that you want to pursue, there may be adverse operational impacts on U.S. military and Intelligence Community space operations. There is a straight-up admission that our current operations would be impacted.

What impact on U.S. military and intelligence operations was there from The Hague Code of Conduct? What binding regulations were issued on the Department of Defense and IC as a result of U.S. subscription to The Hague Code, and can you provide any copies of such regulations that came out of The Hague Code? Apparently when you responded to a staff inquiry on this, you referred to an Ambassador Bolton speech. Obviously that is an insufficient answer, and we would like you to answer more directly.

And, what was it that the U.S. was doing in 2002 that it no longer did as a result of subscription to The Hague Code? Were we proliferating ballistic missiles before the code? But yet, and I want to make it very, very clear, the questions are being asked to you because when we look at the unclassified excerpt from the Executive Summary of the Joint Staff Operations assessment of the draft EU code, it states, "If the United States were to make a good-faith effort at implementing the requirements of the draft code, there could be operation impacts on U.S. military space operations in several areas."

So to do your comparison, the code of conduct with respect to space has an impact on operations that we are doing, would have regulations promulgated under it, and according to your description of it, would bypass the Senate, the nonbinding Hague Code had no

such regulations, impacted no such operations of the United States, and, you know, clearly did not result in a shift of any policy or operations of the United States. They are really not comparative, are they?

Mr. SCHULTE. Mr. Chairman, with The Hague Code of Conduct, as you said, I am not aware of any regulations that were issued afterwards to change our behavior. There was a procedure put in place whereby we started to notify the launches of ICBMs [Intercontinental Ballistic Missiles] and SLBMs [Submarine-Launched Ballistic Missiles] and space launches. And, by the way, as part of that procedure we also put in place a mechanism so that in rare exceptions if we thought it didn't serve our national security interests to make those notifications, we could not make them, and in many ways that is sort of—that is similar—

Mr. TURNER. So a courtesy rather than a regulation, rather than as this statement is, that the code you are advocating for, that it would impact U.S. military space operations in several areas?

Mr. SCHULTE. Well, what we have—so we put in a procedure to notify. In a way, that was the only impact, and we made sure there is an exception clause. With an International Code for Outer Space Activities, we asked the joint staff to conduct that operations assessment, and based upon that we worked with them to come up with a mitigation strategy. And part of the strategy is to make sure that we make clear in developing the code and in subscribing to the code, should we get to that point, that this is a voluntary code and that we will carry it out consistent with our national security interests.

Mr. TURNER. I have to tell you once again, as I said in my opening statement, anything that the Administration does that is a negotiation in the establishment of an international code that is going to have an impact on our military operations, I believe, and I think we believe, I believe this Congress is going to believe, ought to constitutionally include the Senate. And, it is going to be a subject matter that we will be taking up with the National Defense Authorization Act.

Turning to my ranking member, Ms. Sanchez.

Ms. SANCHEZ. Thank you, Chairman Turner. General Shelton, will sensors that can improve detection of a nuclear detonation be incorporated into the SBIRS satellite? Why or why not? What is the cost? And when can we expect the report on this issue that is due to Congress?

General SHELTON. Miss Sanchez, I am trying to recall where we are in the decision process on that, but I believe we have decided that we do not need to include those sensors on SBIRS satellites, and that is because we've got sufficient capability on other satellites, including GPS satellites that have a very robust nuclear detonation detection system on them. As far as the report, when the report might be here, I can't comment on that. Maybe someone else on the table here.

Apparently we are all shaking our heads. We'll take that one for the record if you don't mind.

Ms. SANCHEZ. Okay, and if you could get back to me in a timely manner, because I do agree with Mr. Turner, when we ask for

things for the record, we rarely get them. Sometimes we get them a couple years later.

Ms. SANCHEZ. General Shelton and Ms. Sapp, launch is becoming much more expensive, and although United Launch Alliance has an excellent track record for successful launches, it currently has a monopoly on our launch services. New entrants such as SpaceX may be able to compete if they can prove reliability and mission assurance.

I know we had a track that we were going down to try to include, hopefully, some sort of competition into the arena. But with the current acquisition plan, will it allow new entrants to compete in 2015 if they can prove mission assurance? And if not, what's the earliest time that the new entrants would be able to compete?

General SHELTON. Ma'am, our strategy is defined; our acquisition approach is still being defined. We have asked United Launch Alliance to provide a matrix of costs that would include anywhere between 6 to 10 boosters over a period of 3 to 5 years, and we are looking at that, where the sweet spot might be there not only for cost but also in readiness of these new entrants that enter into competition. During that period, regardless of what that period is, we will continue to track the progress of SpaceX and Orbital and others that are building new boosters, to see if some of them might be ready for, even during this initial period, to compete for launches.

There are two launches specifically that we have set aside that we think people might be able to compete for during that time. If that occurs, great, we will use those as certification opportunities for them, at least on the path towards certification. But it is really up to the new entrants, their technical progress, their ability to show that they are ready to take national security payloads. And, as we come through that process, we are pretty risk-averse in terms of national security payloads, but these two that we have set aside we believe that we can take a little bit more risk.

Ms. SANCHEZ. And so the current budget cuts that are projected over those next 2 to 3, 4 years, are they not—they are not going to impact the schedule? I think you and I sat down, or somebody sat down with the whole schedule of where those sweet spots would be, so nothing has changed with respect to that because of the budget constraints?

General SHELTON. No, Ma'am. Nothing has changed. We are still on track for those two launches for sure, and then we are developing again our acquisition approach to the continuation of the EELV.

Ms. SANCHEZ. Thank you, General. I have a couple more questions for the record.

Mr. TURNER. I just have one more question.

On second thought, we will have questions perhaps for the record also. I want to thank you again for both your patience, your participation, and your leadership. And, General, thank you again for your work on GPS and ensuring that that will continue to be an asset for the Department of Defense. Thank you.

[Whereupon, at 2:34 p.m., the subcommittee was adjourned.]



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# **A P P E N D I X**

MARCH 8, 2012

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**PREPARED STATEMENTS SUBMITTED FOR THE RECORD**

MARCH 8, 2012

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**Statement of Hon. Michael Turner**  
**Chairman, House Subcommittee on Strategic Forces**  
**Hearing on**  
**Fiscal Year 2013 National Defense Authorization**  
**Budget Request for National Security Space Activities**  
**March 8, 2012**

Good afternoon. I want to welcome everyone to the Strategic Forces Subcommittee's hearing on the Fiscal Year 2013 budget request for national security space activities. Our distinguished witnesses this afternoon are:

- General William Shelton, Commander of Air Force Space Command;
- Ambassador Greg Schulte, Deputy Assistant Secretary of Defense for Space Policy;
- Mr. Gil Klinger, Deputy Assistant Secretary of Defense, Space and Intelligence Office; and
- Ms. Betty Sapp, Principal Deputy Director of the National Reconnaissance Office.

Thank you all for appearing before this subcommittee.

I would like to start by congratulating you on the significant accomplishments in national security space over the past year. Due to tremendous efforts of the military, civilians, and contractors of the Department of Defense and Intelligence Community, we have a number of new critical capabilities on orbit. This could not be accomplished without the launch teams' efforts, which continued an impressive record of 49 out of 49 successful EELV launches.

The NRO has completed an extremely aggressive and successful campaign of 6 launches in 7 months. And although we cannot talk here about the capabilities that the NRO brings to the fight, the warfighter, intelligence community, and policymakers are all significantly benefiting from these launches.

While there have been great strides, this year's space hearing is especially important as we work to understand the significant reductions to the space program, and its future impact on national security.

It is clear that space capabilities are essential elements of our military and intelligence construct. Space will continue to be a key enabler of our national security as the U.S. maintains the ability to operate in anti-access, anti-denial environments. As such, in the new Defense Strategic Guidance, the President and Secretary of

Defense listed the ability to operate effectively in space and cyberspace as a primary mission area of the U.S. Armed Forces. Yet, the fiscal year 2013 budget request for Department of Defense space programs was reduced by 22 percent from last year's request.

I am concerned that a significant portion of these funding cuts are taken from research and development programs. For example, the research and development in the Evolved Advanced Extremely High Frequency satellite communications program is reduced by over 75 percent. This investment is part of a broader space acquisition strategy started last year, formerly called Evolutionary Acquisition for Space Efficiency, designed to reinvest savings from a block buy into a stable research and development program to lower risk for future programs.

Further, the Department proposed to terminate two programs that push the boundaries for small satellites and experimental payloads—the Space Test Program and the Operationally Responsive Space office. The Space Test Program has driven innovation from the bench-tops of defense laboratories across the country to on-orbit space capabilities. Many space programs that we rely on daily, such as GPS, have their origins in the Space Test Program. I am not satisfied with the justification that has been provided for terminating the Space Test Program.

The Operationally Responsive Space office was established by Congress in the Defense Authorization process to address the need to rapidly reconstitute space capabilities under various threat scenarios and the desire to shorten the lengthy space acquisition cycle. The ORS office has responded to urgent warfighter needs, and delivered critical capabilities. To date, I am not satisfied with the Department's plan to support this important mission after the proposed ORS termination.

I am pleased to see that the major spacecraft acquisition programs appear to be sufficiently funded in the budget request. Continued investment in core capabilities, such as GPS, AEHF, WGS, MUOS, and SBIRS, remains one of the top priorities. Yet, as some program acquisitions cross multiple services in the Department, we must be conscious of the timing of our investments and properly align the schedules to deliver the spacecraft, ground segment, and user terminals in the most effective manner possible, consistent with the needs of the warfighter.

Assured access to space through our launch program remains another priority for this subcommittee. The price of launch has risen significantly in the past couple years, and the committee will continue close oversight as we work to understand the Air Force's new acquisition strategy for the EELV program. As General Shelton noted in his written testimony, this strategy will address industrial base viability and cost growth while making provisions to leverage emerging competition. Further, as directed in our Fiscal Year 2012 National Defense Authorization Act, we look forward to the President's plan for a National Rocket Propulsion strategy that includes the Department of Defense, NASA, and Intelligence Community efforts. The GAO recently released a report on duplication that noted the space launch acquisition processes for NASA and DOD duplicate one another and may not fully leverage the Government's investment. In your opening testimonies, we would appreciate hear-

ing about collaboration in space launch activities across the Government to reduce duplication and leverage investments.

Regarding space policy, I support the Administration's decision not to sign onto the draft European Union Code of Conduct for Outer Space Activities. However, I am concerned that your stated agreement with elements of this Code of Conduct and intention to negotiate something similar could establish the foundation for a future arms control regime that binds the United States without the approval of Congress, which would bypass the established constitutional processes by which the United States becomes bound by international law. Additionally, I have significant policy and operational concerns with the EU Code of Conduct with regard to national security. Earlier today, I received a written response from the Administration, which was unsatisfactory and leaves no choice but to legislate in the National Defense Authorization Act. The letters will be added as part of the record.

Lastly, as policymakers, we rely on the assessments provided by the National Air and Space Intelligence Center (NASIC) to understand foreign space threats. It is clear that as our dependency on space systems increases and threats continue to develop, our space situational awareness is critical, and the space constellation and ground network must be resilient. NASIC is our first line of all-source intelligence analysis on space threats to form U.S. defense policy decisions. There are many aspects to this important area of national security and we look forward to working together to reach enduring solutions.

Thank you again for being with us today. You each possess a tremendous amount of expertise and insight on our Nation's space policy and capabilities, and our Nation is better off as a result of your service. I look forward to your testimony.

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BY THE ARMED SERVICES COMMITTEE  
SUBCOMMITTEE ON STRATEGIC FORCES  
U.S. HOUSE OF REPRESENTATIVES**

**DEPARTMENT OF THE AIR FORCE  
PRESENTATION TO THE SUBCOMMITTEE ON STRATEGIC FORCES  
HOUSE ARMED SERVICES COMMITTEE  
U.S. HOUSE OF REPRESENTATIVES**

**SUBJECT: FISCAL YEAR 2013 NATIONAL DEFENSE AUTHORIZATION BUDGET  
REQUEST FOR NATIONAL SECURITY SPACE ACTIVITIES**

**STATEMENT OF: GENERAL WILLIAM L. SHELTON  
COMMANDER, AIR FORCE SPACE COMMAND**

**March 8, 2012**

**NOT FOR PUBLICATION UNTIL RELEASED  
BY THE ARMED SERVICES COMMITTEE  
SUBCOMMITTEE ON STRATEGIC FORCES  
U.S. HOUSE OF REPRESENTATIVES**



**Introduction**

Mister Chairman, Representative Sanchez and distinguished members of the Subcommittee, it is my honor to appear before you today as the Commander of Air Force Space Command (AFSPC).

I am privileged to lead over 42,000 Active Duty, Guard and Reserve Airmen; government civilians; and contractors delivering space and cyberspace capabilities around the world for our Nation. The men and women of AFSPC accomplish our mission at 134 worldwide locations, yet we operate in the space and cyberspace domains where borders are nonexistent. AFSPC space and cyberspace capabilities are integral to Joint warfighting, as well as the daily lives of all Americans, and our professionals are passionate in their commitment to excellence and mission success.

This year AFSPC celebrates its 30th anniversary, and for over two of those three decades, the Command has been involved in continuous combat operations. While AFSPC has evolved over the years, with the inclusion and then departure of intercontinental ballistic missile responsibilities, and the relatively new addition of cyberspace operations, a single focus has endured: providing the best capability possible to ensure success on the battlefield.

On January 5, 2012, the Secretary of Defense released a new strategy document titled Sustaining U.S. Global Leadership: Priorities for 21st Century Defense. This new strategy identifies the need to operate effectively in space and cyberspace by stating, "Modern armed forces cannot conduct high-tempo, effective operations without reliable information and communication networks and assured access to cyberspace and space." Space and cyberspace forces are key components to the Nation's ability to project power. In concert with the strategy, our mission is to provide resilient and cost-effective space and cyberspace capabilities for the

Joint force and the Nation. AFSPC's activities are guided by three priorities: support the current fight; control space system costs and deliver capabilities on time and on budget; and for the purpose of organizing, training and equipping, we are operationalizing and normalizing Air Force efforts involving cyberspace. From these general priorities we have adopted three goals to ensure mission success: provide assured full spectrum space and cyberspace capabilities; field resilient, integrated systems that preserve the operational advantage; and provide highly skilled and innovative space and cyberspace professionals. The remainder of the statement is organized around these goals.

**Provide assured full spectrum space and cyberspace capabilities**

Our ability to detect launches, track missiles, navigate with precision, detect nuclear events, support military communications requirements, improve space situational awareness, predict weather, and perform operations in cyberspace are all foundational to the way the Joint force fights today. We depend on the vast capability of our Fourteenth Air Force, Twenty-Fourth Air Force (24 AF), the Space and Missile Systems Center (SMC), Air Force Network Integration Center (AFNIC), Space Innovation and Development Center (SIDC), and the Air Force Spectrum Management Office (AFSMO) to acquire and operate these space and cyberspace systems. The precision and responsiveness needed to deter aggression and win America's wars stem from our ability to integrate and synchronize capabilities across the full range of military operations and all warfighting domains. In space, the Command is deploying the next generation of spacecraft and continuing to provide technologically advanced capabilities. Also, we are pursuing international agreements to expand missile warning, space-based communication capabilities and space situational awareness (SSA). In cyberspace, the

Command is expanding collaboration with our Joint, interagency, and international partners on several initiatives to safeguard our access to the domain. We are operationalizing the Air Force's approach to cyberspace with emphasis on protecting the Air Force infrastructure, developing expertise to meet mission needs, and accelerating our acquisition processes to match the rate of change in cyberspace.

***Missile Warning (Launch Detection and Missile Tracking)***

Our ability to provide strategic missile warning is critical to the Nation's survival. Ballistic missiles also pose a significant threat to deployed U.S. forces and our allies. AFSPC operates both space- and ground-based sensors, providing correlated data that supports the strategic and tactical missile warning missions. Our space professionals continue to improve upon our missile warning capabilities and processes to better alert and inform our commanders. In United States Central Command (USCENTCOM), Captain Kara Sartori, Chief of the Combat Operations Division Space Cell at the Combined Air and Space Operations Center, built revolutionary new procedures which provide more accurate and timely missile warning, thereby better protecting personnel assigned across the USCENTCOM theater of operations.

***Space Based Infrared Systems (SBIRS)***

The Space Based Infrared System (SBIRS), along with the legacy Defense Support Program satellites, provide advanced early warning of hostile missile threats, allowing our warfighters to take swift and precise action. The Active Duty and Reserve Airmen of the 460th Space Wing, Buckley Air Force Base (AFB), CO, as well as assigned British, Canadian and Australian personnel, provided United States Combatant Commanders (COCOMs), coalition partners and allies assured warning for nearly 200 missile launches in 2011. They also reported 7,100 special infrared events--an 82% increase from 2010. Part of that increase was due to the

work of Captain William Sanders and Staff Sergeant Justin Rutherford, 11th Space Warning Squadron, Schriever AFB, who developed new and innovative ways to use the data from these sensors to identify more events of interest to the warfighter.

In May 2011, AFSPC launched the program's first SBIRS Geosynchronous Earth Orbit (GEO) satellite and early mission data are exceeding expectations. This system detects dimmer, shorter duration infrared events and provides more accurate missile launch and impact point predictions than the Defense Support Program satellites. To reduce costs on future acquisitions of these vital satellites, Colonel Michael Guetlein from SMC, Los Angeles AFB, CA, and his program management team streamlined schedules, reduced contractor overhead, and achieved production efficiencies. This effort, and many more like it, will ensure affordable capability well into the future.

The Air Force FY13 request for SBIRS Research, Development, Test and Evaluation (RDT&E) and Procurement is \$950M, paced by ground development and continuing efforts on SBIRS GEO satellites 3 and 4 as well as the procurement of SBIRS GEO satellites 5 and 6. We are requesting the use of advance appropriations to fully fund satellites 5 and 6.

*Upgraded Early Warning Radar (UEWR)*

The UEWR radars are ground-based components of missile warning and missile defense against current and emerging ballistic missile threats. They also provide space object tracking data to help achieve space situational awareness. Throughout 2011, we continued work with the Missile Defense Agency to finalize UEWR deployments to Beale AFB, CA, Royal Air Force Fylingdales, United Kingdom and Thule Air Base, Greenland. In 2012, we will begin the process to upgrade Clear Air Force Station, AK and Cape Cod Air Force Station, MA to the UEWR configuration. At the operational units, long-time system experts, like Mr. Clennis

Burress at Beale AFB, CA, analyzed data from the upgraded radar to assess performance on recent space and missile events. Using his experience and creativity, he has devised ways to extract even more capability from these radars.

***United States Nuclear Detonation (NUDET) Detection System (NDS)***

The NDS has maintained the global situational awareness needed by our national decision-makers and monitored nuclear treaty compliance since the early 1960s. NDS payloads are hosted on the Global Positioning System (GPS) satellites and our Defense Support Program satellites. This capability is also included in the next generation of GPS satellites. The Department of Energy and AFSPC are conducting studies to determine the most effective solution to a long-term space-based NDS architecture.

***Positioning, Navigation and Timing (PNT)***

It is difficult to overstate the impact of GPS on the world. On-line banking, vehicle navigation systems, precision farming, cellular phone location for emergency purposes, precise military operations--these are all enabled by GPS. Last October, I was honored to accept, on behalf of the GPS program, an award from the International Astronautical Federation on the occasion of their 60th Anniversary. The award was given to the program which most benefitted mankind throughout the entire 60 year history of the Federation. I was joined by Colonel (Retired) Bradford Parkinson, who is universally regarded as the father of GPS, and the current program manager, Colonel Bernard Gruber.

The GPS program made great strides in 2011. We improved the security and functionality of GPS-enabled military systems by providing for over-the-air distribution of rekeying for our military receivers. Under the leadership of Captains Vernon Reddick and Jayson Andersen from the 2nd Space Operations Squadron, Schriever AFB, we completed the

final phase of an operation called “Expandable 24”--the largest satellite repositioning effort in GPS history. The constellation is now optimized for terrestrial coverage in challenging environments such as cities with tall buildings and the mountains and valleys of Afghanistan.

Through the summer and fall of 2011, Captain Justin Deifel from SMC’s GPS System Program Office, Los Angeles AFB, expertly led three rigorous tests on behalf of the National Space-Based PNT Systems Engineering Forum to quantify the potential for interference to military and civilian GPS users from LightSquared’s proposed terrestrial network. His technical prowess and objectivity ensured these nationally significant tests were professionally accomplished in a thorough, fact-based manner.

We currently have 34 GPS satellites on-orbit with a combined 380 years of service. The oldest GPS operational satellite on orbit was launched 21 years ago. The second launch of our newest version, GPS-IIF, occurred in July 2011. Captain Steve Dirks from our GPS Reserve Associate Unit, 19th Space Operations Squadron, Schriever AFB, led the check-out of the satellite, integrating it into the operational constellation in August 2011. GPS-IIF satellites are a major component of the GPS modernization process: introducing greater accuracy through advanced atomic clock technology, providing military signals that are more resistant to jamming, adding a new “safety of life” civilian signal, and lowering operating costs through a longer design life. Development of the next generation satellite, GPS-III, is on-cost and on-schedule. These satellites add a fourth civil signal to the constellation and complete the deployment of two civil signals and military signal capabilities that began with earlier GPS satellites. GPS-III will allow us to affordably sustain and modernize the constellation. AFSPC will continue to be proud stewards of this incredible capability, and in line with the National Space Policy, we will strive to ensure it remains the gold standard for global timing and navigation.

With the ubiquitous use of space systems, to include GPS, in the USCENTCOM Area of Operations, AFSPC forward deploys experts to ensure warfighter needs are satisfied. Captain Bryony Veater, assigned to the 504th Expeditionary Air Support Operations Group in Afghanistan, provided critical forward-based space expertise and training to help deployed forces fully exploit GPS capabilities. As an example of the versatile use of GPS, USCENTCOM performs the precision airdrop of supplies with the Joint Precision Air Drop System, using GPS guided, steerable parachutes. In November 2011, USCENTCOM used this system to airdrop 18,000 pounds of winter fuel to Air National Guard soldiers from my home state of Oklahoma, at Combat Outpost Herrera in eastern Afghanistan.

The Air Force FY13 request for GPS III in RDT&E and Procurement is \$1.264B, which continues GPS III space and ground segment RDT&E and procures additional GPS III Space Vehicles.

***Military Satellite Communications (MILSATCOM)***

The demand for MILSATCOM continues to grow as warfighters increasingly depend on information relayed from space, especially for today's distributed operations in this era of information-enabled warfare. Our protected and survivable MILSATCOM supports Presidential communications, forms the backbone of our Nuclear Command and Control System, and provides services for operations in contested environments. MILSATCOM also enables day-to-day communications in more benign environments. There are 18 MILSATCOM satellites on-orbit with a combined 183 years of service.

***Advanced Extremely High Frequency (AEHF)***

The first satellite in the next generation of protected and survivable MILSATCOM, AEHF-1, reached geosynchronous orbit in October 2011, approximately 14 months after a

spacecraft propulsion anomaly had stranded the satellite far short of its operational orbit. The AEHF-1 operations team designed an innovative orbit-raising strategy to preserve the planned 14-year design life of the satellite. The team, led by Mr. David Madden, SMC, is a finalist for an Aviation Week Laureate Award to recognize their extraordinary achievement. Each AEHF satellite will provide a ten-fold throughput increase over Milstar in secure, jam-resistant communications for national leaders, COCOMs and our international partners--Canada, the Netherlands and the United Kingdom.

The Air Force FY13 request for AEHF RDT&E and Procurement is \$786M, which provides for remaining development efforts and continued procurement of AEHF Space Vehicles 5 and 6. We are also requesting the use of advance appropriations to fully fund satellites 5 and 6.

*Wideband Global SATCOM (WGS)*

The WGS system provides flexible, high-capacity communications to the Department of Defense, the White House Communications Agency and the State Department. Each satellite improves on the communications capacity, connectivity and flexibility of legacy systems, allowing for seamless crossbanding between users with X and Ka frequency band terminals. WGS supported the Reagan Carrier Strike Group as it provided humanitarian assistance and disaster relief support to Japan in the aftermath of the 2011 Tohoku earthquake and tsunami, allowing users outside of Japan with Ka-terminals to communicate directly with users in Japan with X-band terminals.

WGS-4, the first WGS Block II satellite, launched this past January. These satellites were developed in direct response to warfighter feedback and will support the transmission of airborne intelligence, surveillance and reconnaissance imagery at data rates approximately three times greater than those currently available on Block I satellites. In addition, we are exploring



future enhancements to WGS that will deliver even more flexibility and capacity as we incorporate commercial technology advances and cost-saving practices into the system.

We are especially proud of the robust international partnerships we have formed as part of this program. Australia provided funding for WGS-6, and in January 2012, the Department of Defense and counterpart agencies from Canada, Denmark, Luxembourg, Netherlands and New Zealand signed a Memorandum of Agreement to procure WGS-9 through a cooperative effort.

#### *Space Situational Awareness*

SSA is fundamental to everything we do in space. As our dependence on space capabilities increases, and as the number of space faring nations and objects in space increase, so does the need to improve our SSA. We have a vast amount of SSA data, but we cannot yet fuse those data into a single, correlated, comprehensive situational awareness picture. The Joint Space Operations Center (JSpOC) Mission System (JMS) program will correct this shortfall.

#### *Joint Space Operations Center*

The JSpOC, at Vandenberg AFB, is the primary national security space command and control center for our Nation. Thanks to the dedicated efforts of Airmen such as Major Brian Capps and Master Sergeant Thomas Clark, during one noteworthy surge period, the JSpOC provided simultaneous support to day-to-day global space missions, USCENTCOM activities, United States Africa Command military operations in Libya and humanitarian assistance and disaster relief efforts in Japan. In 2011, JSpOC personnel provided SSA in support of COCOMs by processing 155 million sensor observations and tracking approximately 22,000 man-made objects. They provided reentry warning and analysis for 72 high-interest objects, including the National Aeronautics and Space Administration's decommissioned Upper Atmosphere Research Satellite, and most recently, the Russian Phobos-Grunt spacecraft.

While accomplishing their complex missions, JSPOC personnel manage and update the catalog of all man-made objects that orbit the earth using a system called the Space Defense Operations Center which has been operational since the mid-1980s, and which hasn't had a major software upgrade since the early 1990s. The replacement for this legacy system is the JMS. It will automate many of the tasks done manually today and will incorporate traditional and non-traditional sensor inputs to produce relevant, actionable information for the Commander, Joint Functional Component Command for Space, currently Lieutenant General Susan Helms. In 2011, we completed the restructure of the JMS acquisition program to significantly lower costs, better align initial capability deliveries with warfighter needs and more efficiently execute the program. This streamlined approach leverages existing industry and government investments, while providing on-ramps for industry to contribute products. Initial Operational Capability of the first increment is scheduled for the end of 2012.

The Air Force FY13 request for JMS in RDT&E is \$54.6M, which continues incremental upgrades to SSA and Space Command and Control capabilities.

#### ***Weather***

The Defense Meteorological Satellite Program (DMSP) celebrates its 50th anniversary in 2012. We will extend the tradition of a half century of unique and superb weather forecasting capabilities when we launch the final two DMSP satellites later this decade. Following the Congressional direction in the FY12 budget, the follow-on program to DMSP was cancelled. We will conduct a study this year to define a lower cost, yet capable, weather satellite follow-on program.

### *Cyberspace*

National and Department of Defense leaders recognize the criticality of operations and freedom of action in cyberspace. As the pace of technological, environmental and geopolitical change quickens, the ability of Joint Force Commanders to defend America's interests will increasingly rely on the access, persistence and awareness provided by cyberspace systems and capabilities. To that end, 24 AF is taking a disciplined approach to cyberspace operations to significantly increase our security posture, defend freedom of action, leverage our effectiveness across Joint and coalition operations, and be more efficient with resources consumed for and by our Air Force cyberspace enterprise.

We are presenting cyberspace capabilities, organized by fixed and expeditionary forces, to support our Air Force and Joint Commanders' objectives and required effects. In 2011, cyberspace operators from 24 AF supported five COCOMs in more than 25 operations. Our deployed cyberspace experts facilitated interaction with the COCOMs, contributing to the success of these Joint operations. For Operation ODYSSEY DAWN, Captain Michael Piersimoni deployed from the 624 Operations Center (OC) to assist with United States Africa Command's efforts to leverage cyberspace effects.

In the area of cyberspace operations and innovation, we are pursuing practices to expeditiously leverage new technologies in a cost-effective manner--essential to staying ahead of emerging threats and achieving desired end states. With the help of programmers like Staff Sergeant Ryan Knight and testers like Captain Benjamin Truax, the 688th Information Operations Wing, Lackland AFB, is exercising rapid cyberspace capability innovation processes. In just seven days, they met COCOM needs by developing and testing a new cyberspace capability; creating tactics, techniques and procedures; and training operators. Using similar

processes, we were able to expeditiously deliver 28 new cyberspace enhancements to support warfighter urgent needs in 2011.

We are also building a consolidated Air Force Network, known as the AFNet. Major General Suzanne Vautrinot, 24 AF Commander, leads the operation and defense of this network for the Air Force as the AFNet Operations Commander. We continue to make progress toward consolidation of the AFNet projected for completion by the end of FY13. As of February 13, 2012, Major Gregory Roberts, 561st Network Operations Squadron, Detachment 3, Scott AFB, IL, and Mr. Nick Davenport, AFNIC, also at Scott AFB, led the migration of 34 bases onto the AFNet, retiring 30 legacy networks and collapsing 104 connections to the Global Information Grid to 16 defensible gateways. These significant steps reduce the costs to operate and enable us to better defend our complex network, supporting over 845,000 users. Operating the network under the principle of centralized control and decentralized execution cleared the way for Senior Airman Zane Williams and other members from the 561st Network Operations Squadron's Detachment 1 at Hickam AFB, HI, to restore AFNet connectivity and services less than five hours after the Tohoku earthquake and tsunami.

Our Combat Communications units execute another facet of the cyberspace mission by extending our networks and providing communications to disadvantaged users. Due to the planning efforts of individuals such as Captain David Cox, 54th Combat Communications Squadron, Robins AFB, GA, combat communications personnel provided "last out" communications for redeploying United States combat forces from Iraq. In one case, members of the 263rd Combat Communications Squadron, an Air National Guard unit, volunteered for a short notice deployment, establishing critical communications for the 332nd Air Expeditionary Wing as it relocated from Joint Base Balad in Iraq. In Afghanistan, Staff Sergeant Stephen

Herron, from the 52nd Combat Communications Squadron, Robins AFB, received the Bronze Star for his actions as the sole communications member assigned to an Explosive Ordnance Disposal Joint Task Force where he provided tactical communications and force tracking capabilities for ten teams. Within the United States, our Combat Communications Guardsmen supported firefighters near Bastrop, Texas, as well as recovery efforts following the tragic tornado in Alabama.

***Director of Space Forces***

Our space professionals are assigned and deployed to COCOMs around the globe. In January, I met with Colonel Clinton Crosier, the Air Force Central Command Director of Space Forces, and his team. Captain Tracy Lloyd is revolutionizing how the DoD is providing operations planning products for GPS-enabled systems--making them more combat relevant. Major Natalie Mock and Captain Abraham Brunner are using the multi-spectral Operationally Responsive Space-1 (ORS-1) satellite to solve tough intelligence problems in theater. Colonel Crosier's staff is working hand-in-hand with Lieutenant Colonel Chad Le'Maire, from the Cyber Operations Liaison Element, to oversee systems that bring to bear the full synergy of integrated space and cyberspace capabilities in the USCENTCOM Area of Responsibility.

Colonel Alan Rebholz, the Pacific Air Forces Director of Space Forces, and the team of space professionals in the Pacific are integrating space at new levels as the emphasis increasingly turns to this area. Major Robert McConnell, a space professional in the Strategy Division of the 613th Air and Space Operations Center, and his teammates are planning the space operations portion of Exercise TERMINAL FURY 2012, which will be conducted simultaneously with United States Strategic Command's GLOBAL LIGHTNING exercise. This combined exercise will have an unprecedented, robust space scenario involving participants across the globe.

**Field resilient, integrated systems that preserve the operational advantage**

Our second goal is to field resilient, integrated systems that preserve the operational advantage. As the Air Force lead for the space and cyberspace domains, AFSPC is working hard to build efficient architectures and processes. We are defining better ways of doing business to decrease cost while delivering resilient, integrated and affordable space and cyberspace systems--without compromising mission assurance. As part of our efficient approach, the Command is leveraging the Total Force—Active Duty, Guard, and Reserve Airmen; government civilians; and contractors--across all areas within the Command.

***Launch, Ranges, and Networks***

Every on-orbit space capability begins with a successful launch--there is no room for error in the launch business. Our 45th Space Wing at Patrick AFB, FL, and our 30th Space Wing at Vandenberg AFB, operate the Eastern and Western Ranges, respectively. They supported a combined 19 commercial and government launches in 2011, including the final 3 Space Shuttle missions. They also conducted over 2,500 weapon system tests, aeronautical tests and launch support operations. Our emphasis on mission assurance underscores an unprecedented record in the history of space flight--83 consecutive successful National Security Space launches since 1999. Mission assurance is a rigorous, structured and disciplined application of systems engineering, risk management, quality assurance, and program management principles throughout a space system's life cycle.

Launch is often the greatest risk to any space system. There are many examples of how rigorous mission assurance detected and corrected issues that would have led to launch failures if uncorrected. We have a dedicated team of mission assurance technicians at both launch bases performing meticulous quality control for launch operations. On the East Coast, Master Sergeant

Michael Claus, 5th Space Launch Squadron, identified a safety violation during hardware movement operations, preventing costly damage to the Atlas V assigned to the Navy's Mobile User Objective System satellite. On the West Coast, Staff Sergeant Paul Lillie from the 4th Space Launch Squadron, Vandenberg AFB, observed and reported a leak in a valve during processing of an Atlas V in preparation for an April 2011 National Reconnaissance Office mission. Failure of this component during launch would have prevented proper orbital insertion of the payload, leading to mission failure.

Mission assurance also includes careful oversight of spacecraft processing at the launch base in preparation for launch. Captain Amanda Zuber and other members of the 45th Launch Support Squadron, Patrick AFB, performed spacecraft mission assurance activities for the first SBIRS GEO spacecraft, which is now exceeding performance expectations on-orbit. Air Force launch and range services are on track to support 11 Evolved Expendable Launch Vehicle missions in 2012: 8 National Security Space launches, 2 National Aeronautics and Space Administration launches, and 1 commercial Orbital Test Vehicle launch.

Due to the critical dependence of the space mission on our launch capabilities, the Air Force established a Program Executive Office for Space Launch to provide a focused effort as we define the future of space launch. In November 2011, the Air Force Service Acquisition Executive approved a new acquisition strategy addressing industrial base viability and cost growth while making provisions to leverage emerging competition. The Air Force, in cooperation with the National Reconnaissance Office, is committed to an annual production rate of launch vehicles, creating more predictability and stability in the program. In addition, the Air Force published a New Entrant Certification Guide, providing a structured certification process by which prospective commercial launch providers become eligible to compete for national

security launch service contract awards. Both the annual production rate commitment and the leveraging of new entrants are key elements we must balance as we conduct the FY13 through FY17 acquisition program, led by Colonel William Hodgkiss, our program manager at SMC. This acquisition program will define the landscape for National Security Space assured access into the next decade.

The Air Force FY13 request for the Evolved Expendable Launch Vehicle Procurement is \$1.680B, which provides launch infrastructure and boosters for national security space launches.

For many of our Nation's most critical satellites, the Air Force Satellite Control Network provides launch support, the capability to receive satellite data, and command and control of these spacecraft once on-orbit. In 2011, our space professionals used the network to conduct over 159,000 satellite contacts, support 15 launches and more than 20 space vehicle emergencies, averaging 450 satellite contacts per day. The network added a new operational antenna in Diego Garcia, doubling our capacity in the Indian Ocean to support satellite operations and to meet near-real-time warfighter, weather, missile warning, PNT, surveillance and communication needs. We are modernizing the Air Force Satellite Control Network by replacing its decades-old communication, scheduling, and antenna systems.

***Commercially Hosted Infrared Payload***

One avenue AFSPC is exploring for improving system resiliency is the concept of hosting government payloads on commercial satellites. The Commercially Hosted Infrared Payload is a government infrared payload hosted on the SES-2 commercial spacecraft. From program initiation to launch in 39 months, this payload successfully reached orbit with its host, after launch on a European Ariane V rocket from Kourou, French Guiana in September 2011. This mission is providing lessons learned on the operational- and cost-effectiveness of hosting



government payloads on commercial satellites, while also demonstrating a potential approach to mission resiliency.

#### ***Defensive Space Control***

We rely on resilient architectures complemented with passive and active defense measures to deter, and if necessary, defeat potential adversary attacks against our forces. In the defensive space control mission, the Rapid Attack, Identification, Detection, and Reporting System Deployable Ground Segment-0 (RDGS-0), continues its trend of sustained excellence in the USCENTCOM Area of Responsibility. In the past year, the members of the 16th Space Control Squadron, Peterson AFB, CO, and its collocated Reserve Associate unit, the 380th Space Control Squadron, deployed the Bounty Hunter system to increase the capability of RDGS-0. The current deployment team, led by Major Matthew Wingert from the 380th Space Control Squadron, and Master Sergeant Timothy Tennerman from 460th Space Wing, are helping protect the vital communications links across all of USCENTCOM's operations.

#### ***Responsive Capabilities***

In 2011, the Air Force launched two space systems demonstrating responsive space principles. ORS-1 launched in June 2011 on a Minotaur I rocket from the National Aeronautics and Space Administration Wallops Flight Facility, Wallops Island, VA, only 32 months from program initiation. USCENTCOM began using the imagery products from this satellite one month later. Personnel from the 1st Space Operations Squadron and their Reserve Associate Unit, the 7th Space Operations Squadron, at Schriever AFB, are using the Multi-Mission Satellite Operations Center to command and control the satellite. This command and control suite is AFSPC's first step toward a common ground system across multiple satellite programs,

with the goal of reducing ground system costs for new programs. Captain David Gwilt from SMC is leading the maturation of this architecture.

The second Orbital Test Vehicle, X-37B, mission launched in March 2011 and has surpassed the first mission's eight-month duration, proving the flexibility of this unique system. Major Scott Babb, from the SIDC 3rd Space Experimentation Squadron, is leading the operations team as they explore the capabilities of this system.

#### ***Electromagnetic Spectrum***

Electronic devices are pervasive in modern warfare, increasing the demand for electromagnetic spectrum access. AFSPC's AFSMO preserves access to the electromagnetic spectrum for Air Force and selected Department of Defense activities. Mr. Joseph Sulick and his team maintained over 30,000 frequency assignments essential to test, training, Joint and Service exercises and operations. AFSMO's strategic planning efforts, led by Mr. Frederick Moorefield, focus on assuring the continued and improved spectrum access required for critical military systems as both national and international demand increases for finite spectrum resources. Within the United States, they are supporting the President's direction to identify spectrum for broadband wireless services. Internationally, they are engaged with the U.S. delegation to the United Nations International Telecommunication Union's World Radiocommunication Conference to protect United States and Air Force spectrum interests.

#### ***Single Integrated Network Environment***

The Air Force requires an integrated enterprise network to assure core cyberspace capabilities. Colonel Rizwan Ali, Commander of AFNIC at Scott AFB is forging the AFSPC Single Integrated Network Environment into reality. Mr. Frederick Chambers and his team of professionals are collaborating with leaders from SMC, 24 AF and my staff to achieve the

desired end state of seamless information flow across terrestrial, air and space domains.

Networthiness, as a component of the Single Integrated Network Environment, will offer integration and interoperability for Air Force networks.

To fuse partnerships with industry leaders, Lieutenant Colonel Jeri Harvey led the Air Force's inaugural Software Development Forum. During the forum, AFNIC announced upcoming changes to Air Force standards for integrating and supporting applications across the AFNet. These standards will increase our security posture while reducing the number of network resources required. The Software Development Forum, along with other efforts, will help us to provide cyberspace network-centric capabilities to the warfighter.

#### **Provide highly skilled and innovative space and cyberspace professionals**

Our third goal is to provide highly skilled and innovative space and cyberspace professionals. AFSPC is educating, training and cultivating experts skilled in space and cyberspace capabilities and their integration across the full range of military operations in all domains. They are tactically and operationally proficient, and are ready to deploy at a moment's notice.

#### ***Space Education, Training, Wargames and Exercises***

Each year, the SIDC's Advanced Space Operations School (ASOpS) provides advanced training to more than 1,930 DoD personnel, while the National Security Space Institute (NSSI) provides space professional certification courses to over 800 personnel from all Services and military representatives from select allied nations. At the end of 2011, the Air Force had over 13,000 certified space professionals. The MILCON project to house ASOpS and NSSI on Peterson AFB is near completion and a ribbon-cutting ceremony is scheduled for this spring.

The Schriever Wargame series is a valuable tool for examining the opportunities and threats inherent to the space and cyberspace environments. The Wargame Director, Major David Manhire, from the SIDC, Schriever AFB, will execute the Schriever 2012 Wargame in two phases with a renewed focus on the operational level of planning. The International Wargame is based on a contingency operation, involving North Atlantic Treaty Organization nation participation on the game floor for the first time. In September 2012, Australia, Canada and Great Britain will join the United States in executing the second phase of the Wargame.

Last year marked the first time a tactical space unit participated in a Distributed Mission Operations exercise from their home station. The SIDC's Distributed Mission Operations Center for Space served as the environment for the 2nd Space Warning Squadron at Buckley AFB, to provide theater ballistic missile warning to the 612th Air and Space Operations Center at Davis-Monthan AFB, AZ. SIDC also premiered the GPS Environment Generator during a Blue Flag exercise. This system generates realistic degraded navigation effects and weapons accuracy, allowing operators and planners to see the direct influence of anticipated hostile and non-hostile GPS interference. Further integration of this model is in work to allow aircrews to plan and employ weapons in a virtual environment.

#### ***Cyberspace Education, Training and Wargames***

The Air Force must have professionals capable of integrating cyberspace capabilities across the warfighting domains. Under the Cyberspace Professional Development Program, Total Force personnel receive continuing education to progress from a foundation of fundamentals, through demonstrated depth of knowledge of experience and application, to a strategic understanding of cyberspace. In December 2011, the Air Force formalized this

program to include a certification process. We now have over 5,200 Air Force Total Force personnel certified as cyberspace professionals.

In partnership with Air Education and Training Command and Air Combat Command, AFSPC continues to build a highly skilled cyberspace work force by providing cyberspace training at all levels of the Air Force. The 333rd Training Squadron at Keesler AFB, MS graduated the first class of enlisted Cyberspace Defense Operators. With the dedicated efforts of Airmen such as Captain Laura Sepeda, the 39th Information Operations Squadron, Hurlburt Field, FL, graduated the first class of students from Intermediate Network Warfare Training in 2011. They also developed the first Initial Qualification Training, allowing cyberspace operators to arrive at operational units fully qualified to perform the mission. Members of this squadron received the 2011 United States National Cybersecurity Innovation Award from the SANS Institute for “Developing World-Class Cyberspace Talent” through their use of simulators and training ranges to allow students to conduct defensive cyberspace operations. The Air Force Institute of Technology’s Cyberspace Technical Center of Excellence began conducting the Cyberspace 200 and 300 intermediate and advanced professional development courses in June 2010. Through the end of 2011, they have graduated 754 people from these courses. In June 2012, the United States Air Force Weapons School at Nellis AFB, NV will conduct the first Cyberspace Weapons Instructor Course. Once the students complete this difficult six-month course, the initial cadre of weapons officers will be instrumental in developing unit level tactics and supporting operational level planning to meet the challenges of evolving cyberspace threats.

Red Flag is the Air Force’s advanced aerial combat training exercise. During Red Flag 2011-3 missions, Major Benjamin Montgomery, 624 OC, made history as the first cyberspace operator to lead an exercise event as the designated Mission Commander--integrating full

spectrum capabilities into Air and Space Operations Center mission planning and operations. Red Flag is the ideal venue for demonstrating and exercising full spectrum cyberspace capabilities and we intend to continue on this path.

Our cyberspace operators reached a major milestone with the planning and execution of the first Cyber Flag in October 2011 at Nellis AFB, NV. This Joint exercise fused cyberspace across the full spectrum of operations against a realistic and thinking enemy in a virtual environment. Personnel from the AFNIC Simulator Training Exercise Division, led by Major Russell Montante, gave cyberspace operators the opportunity to gain hands-on experience in protecting, defending and fighting in a safe realm without impact to operational networks.

Technically educated U.S. citizens are a national resource--vital to national security, and essential to our ability to operate in, from and through the space and cyberspace domains. The Air Force provides world class space and cyberspace education and training that builds on our Airmen's secondary and university education. However, increasingly fewer of our Nation's students are pursuing STEM (science, technology, engineering and math) degrees. As many STEM-educated professionals reach retirement age in this country, the lack of technically educated U.S. citizens creates serious shortfalls in many industries, which results in tough competition for this vital resource. As a Nation, we must comprehensively address this shortage in technical talent if we hope to maintain our advantage in an increasingly complex global environment.

**Continue to take care of people--our most treasured asset, America's sons and daughters**

As AFSPC reaches our three goals, we remember that our first and highest priority is to support our Nation's warfighters in harm's way--to give them the tools needed to fight and win as

quickly and safely as possible. At the same time, we maintain a continuing focus on ensuring our military and their families have access to necessary services on the homefront.

In Colorado Springs, AFSPC partnered with the local community on several initiatives. One element of this partnership is providing resources for those dealing with Post Traumatic Stress Disorder and Traumatic Brain Injuries as they transition to civilian life.

This summer, the Los Angeles AFB Airman and Family Readiness Center, working with the Air Force Recovery Care Coordinator for California, intervened in the military out-processing of one of our highest decorated heroes. They guided him through the process to receive a medical retirement, vice separation, allowing for continued access to the medical care he needs to recover. The team also provided support when this quiet hero lost a family member in combat in Afghanistan.

This spring, Colorado Springs is once again hosting the Warrior Games. These athletic endeavors allow wounded and seriously ill service members to incorporate sports training as a part of their overall transition and recovery plan. It is the Command's privilege to support this event and help honor our Nation's Wounded Warriors.

Unfortunately, not all of our warriors return home. This year AFSPC remembers two of our own who fell on the battlefield: Major Charles Ransom and Airman First Class Matthew Seidler. Their sacrifice serves as a very personal reminder that we owe our best efforts to our warfighters each and every day. We will never forget them and we pray that their families find comfort in their loved one's contribution to freedom.

**Conclusion**

The members of AFSPC have a passion about service to our Nation. Our professionals are innovative. They continue to provide the world class space and cyberspace capabilities for which AFSPC is known, and they have the courage to not only do the right things, but also to do things right. Our Command is about producing excellence--every day. We believe passion, innovation and courage lead to that excellence. And because we operate in domains that reach well beyond the globe, our slogan is Excellence, Global and Beyond. It is truly a privilege to command AFSPC and I appreciate the opportunity to represent this great Command before the Subcommittee.





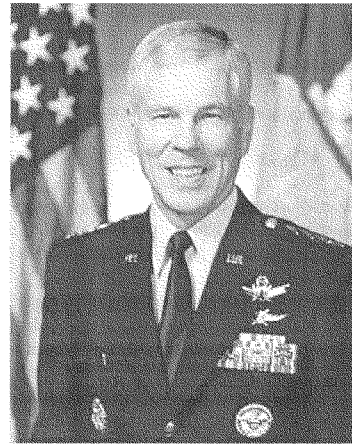
## BIOGRAPHY



**UNITED STATES AIR FORCE**

### GENERAL WILLIAM L. SHELTON

Gen. William L. Shelton is Commander, Air Force Space Command, Peterson Air Force Base, Colo. He is responsible for organizing, equipping, training and maintaining mission-ready space and cyberspace forces and capabilities for North American Aerospace Defense Command, U.S. Strategic Command and other combatant commands around the world. General Shelton oversees Air Force network operations; manages a global network of satellite command and control, communications, missile warning and space launch facilities; and is responsible for space system development and acquisition. He leads more than 46,000 professionals, assigned to 88 locations worldwide and deployed to an additional 35 global locations.



General Shelton entered the Air Force in 1976 as a graduate of the U.S. Air Force Academy. He has served in various assignments, including research and development testing, space operations and staff work. The general has commanded at the squadron, group, wing and numbered air force levels, and served on the staffs at major command headquarters, Air Force headquarters and the Office of the Secretary of Defense. Prior to assuming his current position, General Shelton was the Assistant Vice Chief of Staff and Director, Air Staff, U.S. Air Force, Pentagon, Washington, D.C.

#### EDUCATION

1976 Bachelor of Science degree in astronautical engineering, U.S. Air Force Academy, Colorado Springs, Colo.  
 1980 Master of Science degree in astronautical engineering, U.S. Air Force Institute of Technology, Wright-Patterson AFB, Ohio  
 1986 Armed Forces Staff College, Norfolk, Va.  
 1995 Master of Science degree in national security strategy, National War College, Fort Lesley J. McNair, Washington, D.C.  
 1996 Program for Senior Officials in National Security, Syracuse University and Johns Hopkins University  
 1997 Fellow, Seminar XXI, Massachusetts Institute of Technology, Cambridge

#### ASSIGNMENTS

1. August 1976 - May 1979, launch facilities manager, launch director and technical assistant to the commander, Space and Missile Test Center, Vandenberg AFB, Calif.
2. May 1979 - December 1980, graduate student, U.S. Air Force Institute of Technology, Wright-Patterson AFB Ohio
3. January 1981 - July 1985, space shuttle flight controller, Johnson Space Center, Houston, Texas
4. July 1985 - January 1986, student, Armed Forces Staff College, Norfolk, Va.
5. January 1986 - July 1988, staff officer, Deputy Chief of Staff for Operations, Air Force Space Command, Peterson AFB, Colo.
6. August 1988 - August 1990, staff officer, Office of Space Plans and Policy, Office of the Secretary of the Air Force, Washington, D.C.

7. August 1990 - June 1992, Commander, 2nd Space Operations Squadron, Falcon AFB, Colo.
8. June 1992 - June 1993, executive officer to the Vice Commander, Air Force Space Command, Peterson AFB, Colo.
9. June 1993 - July 1994, Commander, 50th Operations Group, Falcon AFB, Colo.
10. August 1994 - June 1995, student, National War College, Fort Lesley J. McNair, Washington, D.C.
11. June 1995 - September 1997, Deputy Program Manager and Executive Assistant, Cooperative Threat Reduction Program Office, Office of the Assistant to the Secretary of Defense for Nuclear, Chemical and Biological Defense Programs, Washington, D.C.
12. September 1997 - August 1999, Commander, 90th Space Wing, Francis E. Warren AFB, Wyo.
13. September 1999 - July 2000, Chief, Space Superiority Division, Office of the Deputy Chief of Staff for Plans and Programs, Headquarters U.S. Air Force, Washington, D.C.
14. July 2000 - November 2000, Director of Manpower and Organization, Office of the Deputy Chief of Staff for Plans and Programs, Headquarters U.S. Air Force, Washington, D.C.
15. November 2000 - May 2002, Director of Requirements, Headquarters Air Force Space Command, Peterson AFB, Colo.
16. June 2002 - January 2003, Director of Plans and Programs, Headquarters AFSPC, Peterson AFB, Colo.
17. January 2003 - May 2003, Director, Air and Space Operations, Headquarters AFSPC, Peterson AFB, Colo.
18. June 2003 - January 2005, Director of Capability and Resource Integration (J8), USSTRATCOM, Offutt AFB, Neb.
19. January 2005 - May 2005, Director of Plans and Policy (J5), USSTRATCOM, Offutt AFB, Neb.
20. May 2005 - December 2008, Commander, 14th Air Force (Air Forces Strategic), AFSPC, and Commander, Joint Functional Component Command for Space, USSTRATCOM, Vandenberg AFB, Calif.
21. December 2008 - July 2009, Chief of Warfighting Integration and Chief Information Officer, Office of the Secretary of the Air Force, the Pentagon, Washington, D.C.
22. July 2009 - January 2011, Assistant Vice Chief of Staff and Director, Air Staff, U.S. Air Force, Pentagon, Washington, D.C.
23. January 2011 - present, Commander, Air Force Space Command, Peterson AFB, Colo.

#### **SUMMARY OF JOINT ASSIGNMENTS**

1. June 1995 - September 1997, Deputy Program Manager and Executive Assistant, Cooperative Threat Reduction Program Office, Office of the Assistant to the Secretary of Defense for Nuclear, Chemical and Biological Defense Programs, Washington, D.C., as a colonel
2. June 2003 - January 2005, Director of Capability and Resource Integration (J8), USSTRATCOM, Offutt AFB, Neb., as a brigadier general and major general
3. January 2005 - May 2005, Director of Plans and Policy (J5), USSTRATCOM, Offutt AFB, Neb., as a major general
4. May 2005 - July 2006, Commander, Joint Space Operations, USSTRATCOM, Vandenberg AFB, Calif., as a major general
5. July 2006 - December 2008, Commander, Joint Functional Component Command for Space, USSTRATCOM, Vandenberg AFB, Calif., as a major general and lieutenant general

#### **BADGES**

Master Space Operations Badge  
 Basic Cyberspace Badge  
 Parachutist Badge

#### **MAJOR AWARDS AND DECORATIONS**

Distinguished Service Medal with oak leaf cluster  
 Defense Superior Service Medal with oak leaf cluster  
 Legion of Merit with oak leaf cluster  
 Defense Meritorious Service Medal with oak leaf cluster  
 Meritorious Service Medal with four oak leaf clusters  
 Air Force Commendation Medal  
 Joint Meritorious Unit Award with two oak leaf clusters  
 Air Force Outstanding Unit Award with silver and two bronze oak leaf clusters  
 Air Force Organizational Excellence Award with oak leaf cluster

**EFFECTIVE DATES OF PROMOTION**

Second Lieutenant June 2, 1976  
First Lieutenant June 2, 1978  
Captain June 2, 1980  
Major May 1, 1985  
Lieutenant Colonel March 1, 1990  
Colonel Feb. 1, 1994  
Brigadier General Jan. 1, 2001  
Major General July 1, 2004  
Lieutenant General Dec. 20, 2007  
General Jan. 5, 2011

(Current as of January 2011)

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THE HOUSE ARMED SERVICES COMMITTEE

STATEMENT OF

AMBASSADOR GREGORY L. SCHULTE  
DEPUTY ASSISTANT SECRETARY OF DEFENSE  
FOR SPACE POLICY

BEFORE THE HOUSE  
COMMITTEE ON ARMED SERVICES  
SUBCOMMITTEE ON STRATEGIC FORCES

MARCH 8, 2012

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THE HOUSE ARMED SERVICES COMMITTEE

**Committee on Armed Services**

Chairman Turner, Ranking Member Sanchez, and Members of the Subcommittee, thank you for the opportunity to testify on Department of Defense space policy. When I testified here a year ago, the Department, together with the Office of the Director of National Intelligence, had just released the National Security Space Strategy. Today, I am pleased to discuss our progress in implementing that strategy.

U.S. space capabilities allow our military to see with clarity, communicate with certainty, navigate with accuracy, and operate with assurance. Maintaining the benefits afforded to the United States by space is central to our national security, but the evolving strategic environment increasingly challenges U.S. space advantages. Space is increasingly congested, with over 22,000 trackable man-made objects in orbit, contested, by an ever-increasing number of man-made threats, and competitive, as the U.S. competitive advantage and technological lead in space erodes.

However, the challenges of a congested, contested, and competitive environment also present the United States with opportunities for leadership and partnership. The joint Department of Defense and Intelligence Community National Security Space Strategy released last year charts a path for the next decade to respond to the current and projected space strategic environment.

The National Security Space Strategy identifies three U.S. national security space objectives: strengthen safety, stability, and security in space; maintain and enhance the strategic national security advantages afforded to the United States by space; and energize the space industrial base that supports U.S. national security. Achieving these objectives will ensure our military continued access to space-based assets national security purposes.

The United States will retain leadership in space by strengthening our national security, civil, and commercial space capabilities and improving our collaboration with others worldwide. Leadership cannot be predicated on declaratory policy alone. It must build upon a willingness to maintain strategic advantages while working with the international community to develop collective norms of responsible behavior, collaborate on capabilities with international and industry partners, and improve our coordination and information sharing.

The President and Secretary of Defense recently released Strategic Guidance for the Department. This Guidance articulates priorities for a 21<sup>st</sup> century defense that protects the country and sustains U.S. global leadership. It reflects the need for DoD and the military to adapt in order to proactively address the changing nature of the security environment and to reflect new fiscal realities. This Strategic Guidance identifies the need to operate effectively in space as one of the missions most important to protecting national interests. Further, it cites resilience of space capabilities as an important component in projecting power in response to Anti-Access/Area Denial challenges.

The new Strategic Guidance builds on and reinforces key elements of the National Security Space Strategy. The National Security Space Strategy outlines five interrelated strategic approaches to chart a future course for national security in space, and many of those key approaches are also reflected in this Guidance. Both documents emphasize strengthening norms of responsible behavior, and finding opportunities to leverage growing civil, foreign and commercial capabilities. Both detail the need to strengthen deterrence while ensuring preparedness to operate in a degraded environment should deterrence fail. Both highlight the importance of the industrial base, as well as the need for innovative approaches and continued investment in science and technology.

The Strategic Guidance gives us renewed impetus to implement the National Security Space Strategy, and we are incorporating the key points of the strategy into the departmental directives, guidance, and instructions. These documents shape how the DoD conducts the space enterprise, and changes here are integral to ensuring that we respond to this more challenging space environment.

Additionally, we are further defining concepts like resilience as they relate to space. An important facet of the National Security Space Strategy's effort to prevent and deter aggression against our space infrastructure is to strengthen the resilience of our architectures to deny the benefits of an attack. The strategy notes that resilience will also enable our ability to operate in a degraded space environment. As we invest in next generation space capabilities and fill gaps in current capabilities, the strategy directs us to include resilience as a key criterion in evaluating alternative architectures. Resilience is not the property of a single system. Rather, it is the ability of a whole architecture to provide functional capabilities necessary for mission success despite environmental adversity or hostile action. Resilience can be achieved in a variety of ways in space and beyond. These include system protection, cross-domain solutions, leveraging foreign capabilities, maturing responsive space capabilities, and hosting payloads on a mix of platforms.

With this in mind, we developed a definition for resilience and criteria for assessment. We can no longer think only in terms of cost and capability. We must also consider whether that capability will be available when the warfighter needs it and an adversary seeks to deny it. This definition was reviewed and improved by the Defense Space Council and is now being promulgated. Our definition is simple:

“Resilience is the ability of an architecture to support the functions necessary for mission success in spite of hostile action or adverse conditions. An architecture is “more resilient” if it can provide these functions with higher probability, shorter periods of reduced capability, and across a wider range of scenarios, conditions, and threats. Resilience may leverage cross-domain or alternative government, commercial, or international capabilities.”

We are implementing the definition and associated methodology for evaluation through current and future architectures, as well as across the Department’s requirements, acquisition, and budget processes. Resilience is a key criterion in ongoing architecture reviews for our SATCOM, defense weather, and other satellite-based capabilities.

We are taking a leading role in international efforts to promote responsible, peaceful, and safe use of space. The NSSS emphasizes that the United States will promote the responsible, peaceful, and safe use of space as the foundational step to addressing the congested and contested space domain. A more cooperative, predictable environment enhances U.S. national security and discourages destabilizing crisis behavior. We are supporting development of data standards, best practices, transparency and confidence-building measures, and norms of behavior for responsible space operations. For instance, we are participating, with other U.S. departments and agencies, in efforts taking place in the United Nations Committee on the Peaceful Uses of Outer Space to further the long-term sustainability of space.

The Department of Defense supports U.S. efforts to work with the European Union and other spacefaring countries to develop an international code of conduct for space activities. A widely-subscribed Code can encourage responsible space behavior and single out those who act otherwise, while reducing risk of misunderstanding and misconduct. We view the European Union’s draft code of conduct for space activities as a promising basis for an international code.



The EU's draft focuses on reducing the risk of creating debris and increasing transparency of space operations. It already reflects U.S. best practices and is consistent with current practices such as notification of space launches and sharing of space data to avoid collisions. Significantly, the EU's draft is not legally binding and recognizes the inherent right of self-defense. It focuses on activities, rather than unverifiable capabilities, and better serves our interests than the legally-binding ban on space weapons proposed by others. In your recent letter to President Obama, you expressed concerns about the consequences of developing a code of conduct for space activities. As we go through the process of developing an international code, we are committed to ensuring that any code of conduct for space activities advances national security. The U.S. has been closely consulted by the EU on its draft, and we will continue to shape an international Code through active participation in international negotiations. Additionally, DoD has assessed the operational impact of the current draft and developed steps to ensure that a final Code fully supports our national interests and strategy. We are committed to keeping you informed on the process of developing an international Code.

Working with international partners on encouraging responsible behavior in space is only a part of how our engagement with other spacefarers is evolving. The NSSS is driving changes in how we leverage the capabilities of domestic, international, and industry partners. The strategy directs us to pursue opportunities to partner with responsible nations, international organizations, and commercial firms to augment the U.S. national security space posture. Through these partnerships, we can ensure access to information and services from a more diverse set of systems—and advantage in a contested space environment. Decisions on partnering will be consistent with U.S. policy and international commitments and will consider cost, protection of sources and methods, and effects on the U.S. industrial base.

We are expanding our international partnerships and coalition operations. Space is a domain in which we once operated alone. Increasingly, however, we need to think of operating in space as we do in other domains: in coalition.

Allies like France, Japan, Germany, and Italy have increasing space-based capabilities in a range of mission areas. By leveraging their systems, we can augment our capabilities, add diversity and resilience, and complicate the decision-making of potential adversaries. Cooperation can also better enable coalition operations on land, at sea, and in the air, which for our allies and us are increasingly dependent on space-based capabilities.

The Air Force's Wideband Global Satellite (WGS) system provides a good example. Earlier this year, the Air Force announced that Canada, Denmark, Luxembourg, the Netherlands, and New Zealand have joined with the US and Australia in a long-term multilateral partnership. This effort will increase WGS capacity to U.S. warfighters by jointly acquiring and launching a ninth WGS satellite vehicle, while also providing system capacity to the partners. In addition to increasing the size and capacity of the constellation, internationalizing WGS also complicates the calculations of any country contemplating interference with the system.

Led by General Kehler at STRATCOM, the Department is working to transition today's Joint Space Operations Center into a Combined Space Operations Center (CSpOC). A CSpOC will leverage allied space capabilities to augment our own and increase resilience. It will support our ability to operate in coalition operations as we do in other domains and bolster collective defense and deterrence of attack against collective space assets. As the Department works through this transition, we are building on recent space exercises and cooperative activities, including tracking and analysis of the recent Phobos-Grunt spacecraft re-entry,

Combined space operations require increased sharing of space situational awareness and operational information. Earlier this year, the Secretary of Defense transferred to the Commander of USSTRATCOM his authority to enter into space situational awareness (SSA) data sharing agreements with foreign governments. This compliments USSTRATCOM's existing authority to negotiate SSA sharing agreements with commercial satellite operators. With the extension of this authority to foreign governments, the US will be able to better assist partners with current space operations and lay the groundwork for future cooperative projects. The increasingly challenging space environment means that an unprecedented level of information sharing is needed among space actors, to promote safe and responsible operations in space and reduce the likelihood of mishaps, misperceptions, and mistrust.

Commercial satellite owner/operators play an important role in space situational awareness. STRATCOM currently has more than 30 data sharing agreements with these companies. This is just one of the innovative approaches to working with commercial space operators and protecting the space industrial base that is driven by the NSSS . We seek to foster a space industrial base that is robust, competitive, flexible, healthy, and delivers reliable space capabilities on time and on budget. We are exploring innovative approaches, such as anchor tenancy and hosted payloads, and pursuing strategic partnerships with commercial firms to stabilize costs and improve resilience.

International advances in space technology have put increased importance on reforming U.S. export controls to ensure the competitiveness of the U.S. space industrial base while addressing technology security. Reforming export controls will facilitate U.S. firms' ability to compete in the international marketplace for capabilities that are, or will soon become, widely available globally, while strengthening our ability to protect the most significant U.S. technology

advantages. The National Security Space Strategy reaffirms the necessity of these reforms and echoes the National Space Policy's call for giving favorable consideration for export of those items and technologies that are generally available on the global market, consistent with U.S. national security interests. Reforming export controls on space items will increase U.S. manufacturers' ability to provide U.S. content in foreign satellites, increase opportunities for partnering with foreign manufacturers, and help energize the U.S. space industrial base

The National Security Space Strategy responds to an increasingly challenging space environment. The changes detailed in the strategy will allow us to maintain and enhance the strategic advantages we derive from space. Over the past year, we have begun to implement those changes, both in our internal policies, and in how we relate to other spacefaring entities. The Department of Defense's fiscal year 2013 budget request, building on the new Strategic Guidance, helps further the implementation of these changes and maintains the U.S. military's leading edge in space. The future architectures that we are developing will increase resilience while leveraging growing international and commercial capabilities in space. The Department looks forward to working closely with Congress, our allies, and U.S. industry to continue implementing this new strategy for space.



**Gregory L. Schulte**

**Deputy Assistant Secretary of Defense for Space Policy**



Ambassador Gregory L. Schulte has served as Deputy Assistant Secretary of Defense for Space Policy since May 2010.

Ambassador Schulte was U.S. Permanent Representative to the International Atomic Energy Agency and the United Nations in Vienna, where he was dispatched by President Bush in 2005 and extended by President Obama through June 2009. Ambassador Schulte helped report Iran to the UN Security Council, implement the U.S. nuclear cooperation agreement with India, and establish international nuclear fuel banks. After Vienna, Ambassador Schulte spent ten months as a Senior Visiting Fellow at the National Defense University's Center for the Study of Weapons of Mass Destruction.



Mr. Schulte served three tours in the White House under two Presidents. As Executive Secretary of the National Security Council from 2003 to 2005, Mr. Schulte traveled extensively with President Bush, oversaw the White House Situation Room, and was responsible for NSC emergency readiness after 9/11. As Senior NSC Director for Southeast European Affairs from 2000 to 2002, Mr. Schulte advised Presidents Clinton and Bush on U.S. diplomacy and military deployments in Bosnia and Kosovo and oversaw U.S. efforts to bring democracy to Serbia and prevent civil war in Macedonia. As Special Assistant to the President from 1998 to 1999, Mr. Schulte advised President Clinton on the Kosovo crisis and oversaw interagency planning and decision-making for the NATO air campaign and subsequent deployment of KFOR and a UN mission.

From 1992 to 1998, Mr. Schulte was assigned to the NATO Headquarter in Brussels. As Director for Crisis Management and Operations and Director for Nuclear Planning, Mr. Schulte helped NATO adapt its planning and posture after the end of the Cold War. As Director of the Bosnia Task Force, Mr. Schulte helped NATO organize its first out-of-area deployments and its first collaboration with the UN. Mr. Schulte was the first civilian outside the theater of operations to be awarded the NATO Medal.

Mr. Schulte is a member of the Senior Executive Service and has received two Presidential Rank Awards. Mr. Schulte previously served in the Office of the Secretary of Defense as Principal Director for Requirements, Plans and Counterproliferation Policy, Director for Strategic Forces Policy, and Assistant for Theater Nuclear Forces Policy. He began his career in 1983 as a Presidential Management Intern. Mr. Schulte graduated from the University of California at Berkeley in 1980 and earned a Master in Public Administration from Princeton University's Woodrow Wilson School in 1983. He runs marathons, recently completing his sixth, in Paris.

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THE HOUSE ARMED SERVICES COMMITTEE

STATEMENT OF

MR. GIL I. KLINGER  
DEPUTY ASSISTANT SECRETARY OF DEFENSE  
FOR SPACE AND INTELLIGENCE

BEFORE THE HOUSE  
COMMITTEE ON ARMED SERVICES  
SUBCOMMITTEE ON STRATEGIC FORCES

MARCH 8, 2012

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THE HOUSE ARMED SERVICES COMMITTEE

**Committee on Armed Services**

Thank you, Mr. Chairman, Ms Sanchez and members:

It is my pleasure to be part of this distinguished panel, representing the spectrum of disciplines that are key to ensuring the success of our space acquisition programs; from policy and governance, to acquisition oversight, program execution and finally to our critical partnership with the Intelligence Community.

Before I start, I would like to recognize that we are in the middle of a launch campaign with an unprecedented operational tempo across national security space programs since the inception of the EELV program. The successes reflect the combined efforts of our government and industry team which have significantly improved and modernized our space capabilities across all mission areas, even as we are experiencing a significant period of transition for our space systems; a transition that began with the end of the Cold War and continues.

The environment in which we operate evolves and transforms: you've heard us talk about the environment we are operating in, while space was not a benign environment in terms of man-made threats during the Cold War, even that threat environment has been transformed. U.S. space capabilities are subject to a host of new threats including kinetic threats, non-kinetic threats such as jamming, and cyber threats originating from both state and non-state actors.

Every day we have visible signs that the importance of space to U.S. national security and national economic security continues to increase, making space capabilities not only an asymmetric strength and advantage, but also a potential vulnerability. That strength extends to our robust commercial space sector, offering the possibility of provisioning more of our national security space needs with their goods and services. We do need to balance this increased use against (1) a business case that shows that use of commercial goods and services are in our best interest, as well as those of our commercial vendors and providers; (2) the ability to meet our often more stringent and sometimes unique requirements for national security; and (3) that transition can be accomplished in an affordable and secure manner. Cast against this backdrop are the trades we

make whether or not to ease some of our legacy requirements in order to take greater advantage of commercial and allied capabilities.

That transition also has rippled through our space acquisition system which has historically focused on performance driven, edge-of-technology and engineering capacity; we consistently looked to push the edge of the “art and science” of the possible. We could afford this approach because the “addressable market” for most of these capabilities was relatively small as compared to the overall size of U.S. military forces and intelligence users, and these users were often more than not homogenous in their needs and demands. Acquisition of space capabilities frequently and consistently had a “first and often unfettered” call on the resources of the Defense Department and Intelligence Community as compared to many other capability areas.

We no longer have this luxury; space capabilities are now integrated and inextricably bound up in the “nervous system” of U.S. military forces and intelligence capabilities; users of U.S. national security space capabilities are both numerous and diverse in their requirements. Often, maintenance and continuity of service have become as or more important than pushing the envelope to achieve new performance capabilities. In fact, many of our space capabilities have become the “dial tone” of national security. And like the dial tone of our telephones, we take their availability and presence for granted, noticing only when there is an unplanned service interruption. This reality places a special responsibility on those who work in space acquisition to improve the timelines of delivery of new capabilities. We also must focus on ensuring our space architectures are sufficiently robust and resilient to operate through natural and man-made threats.

To ensure our “dial tone” is uninterrupted, we are recapitalizing virtually all of our space “lines of business” at precisely this time of sharply constrained resources, and even at a time that the Nation remains at war and many other sectors of our military are also undergoing refurbishment and recapitalization.

In this environment, here are some of the things we’re doing in the acquisition business to position DoD and our cooperative working relationship



with the Intelligence Community to maintain our leadership position and ensure that our forces have the space capabilities at their disposal to meet requirements. We are committed to a balanced space acquisition process that prepares for future challenges, supports our Strategic Guidance to sustain U.S. global leadership and represents our commitment to accomplish these goals while executing affordable programs, improving efficiency in acquisition execution, and strengthening the industrial base.

This requires us to pursue the challenge of a new strategic framework which informs divestment and investment decisions across all space lines of business. Our challenge for this framework is to accomplish our mission, while making the solutions more affordable. We must have a firm understanding of what capabilities we need now and in the future, how those capabilities interface with other domains, and determine if there is a smart way to reduce cost while maintaining the resources to protect our “seed corn” of promising technologies and most importantly, maintaining continuity of service. We have to be able to answer the questions: (1) how much of what kind of space capabilities are sufficient to meet our known and enduring requirements; (2) how much can we afford to invest to maintain a viable industrial and technology base to ensure it is there when we need it -- and also be able to explore the next generation of breakthrough technologies whose “ancestors” are the predicate for the capabilities we currently have on orbit. As one example, in FY13, we protected funding for upgrades to both the Space Based Infrared System (SBIRS) and Advanced Extremely High Frequency (AEHF) programs.

We are demonstrating our stewardship of these investment decisions by the emphasis we have placed on “should cost” in our acquisitions, under the auspices of the Department’s Better Buying Power initiatives. It is not our intention to reduce corporate profit rightfully earned; we are concentrating on taking the cost out of programs. The simple reality is this: there is simply too much program in the pipeline for the resources that are likely to be available, and we must either find ways to reduce costs, stop buying, or go elsewhere. “Should cost” will be the government point of departure for negotiations with industry partners. We’re putting greater scrutiny on executing oversight earlier in the

acquisition process to enable Program Managers to focus on execution once approvals are obtained. In addition, affordability will be a key performance parameter at Milestone A; this is a significant change for DoD in general, particularly for the space acquisition community. At Milestone B, the engineering trades will show us how each key design feature affects the target cost, enabling us to make more informed cost/performance trades.

As we make significant progress in improving and innovating our acquisition processes, we cannot afford inefficiencies. Over the last year we have evaluated several proposals to improve our acquisition and procurement of space systems, drive down costs, improve industrial base stability, and focus technology investment. These include fixed price contracts, more innovative contracting, and evolutionary upgrades where those make sense. These improvements take advantage of “virtual” fixed price contracting, revised incentives and contract structures for primes, block buys, and technology development integrated into the acquisition strategy. As an example, our budget proposal requested coordinated block buys, funded across multiple fiscal years, for both AEHF 5/6 and SBIRS GEO 5/6 to take advantage of the efficiencies. Also, to avoid the budgetary and programmatic risks often associated with incrementally funding major weapons programs – and in order to ensure full funding – are again requesting the use of advance appropriations for procuring these satellites.

To strengthen the industrial base, we need stability and predictability for the prime contractor and system integrators, and for suppliers (protecting our second and third tier), and incentives that will improve productivity and industry investment, in other words, a realistic long-term plan. We are working these issues with our industry partners every day.

One of the core Better Buying Power initiatives that we are stressing with our industrial partners is to place as much emphasis on engineering for cost reduction and avoidance as we have historically placed on engineering for performance. Placing greater emphasis on cost control and avoidance does not necessarily entail a reduction in mission assurance. In addition, we will shift our

space acquisitions to implement evolutionary introduction of new technologies, and ensure more stable production lines of satellites.

The benefits to industry and the technology base are clear: there will be more reliable and stable demand, more predictable opportunities for introducing new upgrades to technology, and more stability at the prime and second/third tier suppliers.

The goals we are pursuing in our space acquisition processes will sustain space capabilities in support of Combatant Commanders, modernize our space force structure where it is technologically feasible, and evaluate opportunities to leverage commercial partnerships where prudent. The decisions we are making are a direct consequence of the extremely challenging budget cuts that were necessary across the entire DoD. For example, following the Congressional FY12 reduction to the Defense Weather Satellite System (DWSS), for FY13 we developed a new strategy to move forward and we are assessing more affordable alternatives to meet our requirements. We are also assessing the technologies, concepts, and lessons learned from the operational support of the current ORS-1 and TacSat-4 vehicles for integration of responsive space techniques and tenets into other programs across the broader space acquisition community.

Individual affordability initiatives, however, are hollow if they are not supported by a leadership and governance structure which provides the necessary collaborative and more agile oversight and "follow-through". The Defense Space Council (DSC), led by the Executive Agent for Space, is the embodiment of the governance and leadership changes we needed to reflect the diversity of interests in space capabilities and the Department's need to rationalize governance of space issues, including acquisition matters. As the OSD Focal Point and Co-Executive Secretary of the DSC, with the EA for Space, our office works closely with Ambassador Schulte's space policy office, other OSD components, the Air Force, other Services, the NRO, and the ODNI to ensure that we are addressing issues in an integrated manner, and that OSD is speaking with one voice on space issues.

The DSC had a singular impact on the Department's Program Review by providing in-depth review and recommendation of space issues for the Deputy Secretary's Management Action Group (DMAG) review, and the decisions they teed up for the DepSecDef. The DSC, in collaboration with the Intelligence Community Space Board, were able to exercise a shared, disciplined process that supported programmers, the acquisition community, and the policy community, and also took into account interagency concerns. This resulted in the widespread view that the Defense Space Council role made a marked improvement to the effectiveness of the Department's decision process and improved the cooperative environment of program review.

The DSC has also chartered key architecture studies to provide a way forward. These architecture studies provide a firm understanding of what capabilities we need now and in the future, how those capabilities interface with other domains, and determine if there is a smart way to reduce cost while maintaining the resources to protect promising technologies and most importantly, maintaining continuity of service. We believe this is the key to engineering for cost, while not sacrificing performance. As you can see, we are never at a loss for mission areas across the space enterprise that require this level of in-depth analysis, or architectures that need to be fixed. Our focus will be on answering key questions, essential to establishing an affordable way forward and improving our understanding of the tradespace.

Even as the architectures lay down the marker for future capabilities, they also establish the necessary thresholds for executing a reasonable, affordable program that meets a set of revalidated requirements, consistent with our Strategic Guidance. National security threats are not declining, if anything the complexity of the new defense guidance "*Sustaining US Global Leadership*" is increasing. The Secretary's criteria for evaluating strategic programs -- redundancy, multi-role systems and a credible value proposition -- are integral to our evaluation of space programs.

In most areas it is no longer a question of can we do something; it has now evolved to how well do we have to do something and the proportionality, or

degree to which we must do it. This is a fundamentally different business model for us.

Our sustaining strategy must be to maintain current capabilities while building the needed capabilities to address tomorrow's threats, while simultaneously maintaining essential industrial capacity and acquisition program stability.

Thank you for the opportunity to present the Department's space acquisition strategy and goals to this distinguished committee.



## Gil I. Klinger

Deputy Assistant Secretary of Defense,  
Space and Intelligence Office



Mr. Gil Klinger is the Deputy Assistant Secretary of Defense for Space and Intelligence within the Undersecretary of Defense for Acquisition, Technology, and Logistics where he is responsible for acquisition oversight of all space and intelligence programs executed by the Department of Defense.

Immediately prior to assuming leadership of SIO, Mr. Klinger was the Assistant Deputy Director of National Intelligence for Architecture Engineering & Integration where he led Intelligence Community activities assessing the adequacy of the intelligence collection enterprise, identified shortfalls and solutions, managed teams focused on specific short- and long-term issues in response to Director of National Intelligence taskings, and provided domain and subject matter expertise to the Office of the Director of National Intelligence across a broad range of disciplines and collection areas.

Prior to his assignment at the Office of the Director of National Intelligence, Mr. Klinger was the Director of Space Policy, National Security Council Staff, where he was the lead member of the Executive Office of the President on all space issues. He is principal author of five national space policies, including the first new U.S. space exploration vision in more than a generation.

His previous assignments included serving as Director of Policy, National Reconnaissance Office; Acting Deputy Under Secretary of Defense (DUSD) for Space, and the position of Principal Assistant (DUSD/Space), within the Office of the Deputy Under Secretary of Defense for Acquisition and Technology, where he received the 1997 Presidential Rank Meritorious Executive Award, one of the two highest awards given to civil servants within the U.S. government; Director, Space and Advanced Technology Strategy, also within the Office of the Under Secretary of Defense for Policy; and Staff Assistant, Deputy Director for Strategic Forces Policy, Office of the Under Secretary of Defense for Policy, where he was awarded the Distinguished Civilian Service Medal, the highest award given to civil servants within the Department of Defense.

Mr. Klinger began his career in government service with his competitive selection to the Presidential Management Internship Program with the Office of the Secretary of Defense.

Mr. Klinger graduated Phi Beta Kappa and summa cum laude from the State University of New York at Albany with an undergraduate degree in European History and Political Science. He received his master's degree in Public Policy from the John F. Kennedy School of Government at Harvard University.

Mr. Klinger has been a member of the Senior Executive Service since 1992 and a member of the Senior Intelligence Service since 1999.



If you would like more information please visit:  
Space and Intelligence Office • <http://www.acq.osd.mil/sio>

Statement for the Record

Ms. Betty Sapp

Principal Deputy Director, National Reconnaissance Office

Before the House Armed Services Committee

Subcommittee on Strategic Forces

8 March 2012

NOT FOR PUBLICATION UNTIL RELEASED BY THE  
HOUSE ARMED SERVICES COMMITTEE  
STRATEGIC FORCES SUBCOMMITTEE  
UNITED STATES HOUSE OF REPRESENTATIVES

**INTRODUCTION**

Chairman Turner, Ranking Member Sanchez, and distinguished Members of the Committee, I am pleased to appear before you today on behalf of General Bruce Carlson (USAF, Ret.), the Director, National Reconnaissance Office (DNRO), to discuss the NRO fiscal year (FY) 2013 National Defense Authorization Budget Request for National Security Space Activities. It is an honor for me to appear alongside our mission partners from the Department of Defense (DoD), Ambassador Greg Schulte, Deputy Assistant Secretary of Defense for Space Policy; Mr. Gil Klinger, Deputy Assistant Secretary of Defense for Space and Intelligence and General William Shelton, Commander, Air Force Space Command. The NRO's close relationship and continuing partnership with our mission partners are vital to maintaining our Nation's superiority in space.

The unclassified nature of today's hearing precludes me from discussing many details of NRO programs, as well as sharing some of our greatest successes. However, I welcome the opportunity to meet in another setting to fully discuss with you the breadth and depth of NRO capabilities, partnerships, and value of the NRO contributions to National Security.

**DNRO Priorities.** Since taking the helm at the NRO three years ago, Director Carlson established four goals for the organization: launching capabilities when scheduled, ensuring



our acquisition programs remain in the "green" (meeting cost, schedule, and performance), ensuring strong continued investment in research and development, and expediting operational availability of our systems while maximizing life expectancy (over expected life) for on-orbit systems. To attain these goals, we focus on executing acquisition programs on time and cost through an evolutionary approach to realizing revolutionary new capabilities - an approach made possible by strong research and technology investment. We also continue to improve our relationships with our key mission partners to adapt on-orbit systems and capabilities to support current warfighter needs.

**State of the NRO.** I would like to begin with a few words about the state of the NRO today. Last year we executed the most aggressive launch campaign in over 25 years. We successfully launched six satellites in seven months and this year with the same determination we're scheduled to launch four more in five months with the first scheduled launch later this month. Our ability to sustain such high tempo is due both to the diligent efforts of our program teams who successfully acquire and deliver these complex systems on time, and our strong partnerships with the Air Force launch community. These successful launches are a very important and visible reminder of the space reconnaissance mission the NRO started over 50 years ago, and continues with such great success today. We are

committed to smart acquisition investments and practices to ensure the continued coverage and availability of our vital National Security systems and we work tirelessly to deliver these systems on time and within budget.

The NRO remains committed to using the qualified launch vehicles that meet our requirements and are consistent with the need for assured access to space. The health of the launch industrial base and enhancing assured access to space is essential to the success of our programs and their launch platforms. The NRO is committed to improving the launch industry, as demonstrated by the joint NRO/Air Force development of a new Evolved Expendable Launch Vehicle (EELV) acquisition strategy aimed at sustaining the launch industrial base while stabilizing launch costs. In addition to EELV, the NRO plans to compete launch services for appropriate missions, consistent with the new, joint Air Force, NRO and NASA coordinated strategy for new entrant launch vehicles certification. The NRO, Air Force, and NASA, have jointly agreed on this new entrant launch provider strategy to facilitate competition, avoid undue duplication in the certification process, and ensure the Government is receiving the most cost effective launch services to meet our required performance. We are dedicated to working with the Air Force, NASA, and commercial space providers to

ensure our Nation's launch and space industrial base remains strong enough to meet our mission requirements.

From launching and operating the most technically-capable systems to continued operations of legacy satellites the NRO remains the premier space reconnaissance organization in the world. The unique composition of our workforce is one of our greatest strengths. As you know, we draw our personnel from across the DoD and Intelligence Community (IC), recruiting the best and brightest acquisition, operations, and engineering personnel from the space community. The talented people of the NRO allow our significant and continued mission success, and enable our ability to provide the very best information from the warfighter to the policymaker. Director Carlson and I are both confident that by continuing to leverage current successes and community workforce strengths, the NRO will continue to provide the Nation with the premier space reconnaissance capabilities for National security.

For the third year in a row, the NRO received a clean audit opinion on our Financial Statements, a truly unprecedented accomplishment within the IC. This positive outcome was the result of continued hard work across the NRO workforce and the culmination of a diligently planned and executed effort to continue our achievement in effective financial management. NRO's internal processes for proper funds management and

accurate financial reports have been validated, and we are successfully positioned to continue to sustain this clean audit into the future.

#### **EVOLUTIONARY ACQUISITION**

Maintaining a healthy space industrial base, coupled with delivering programs on cost and schedule, is a matter of critical importance to our national security. Evolutionary acquisition practices, used successfully for decades by the NRO, can help us sustain our industrial base in the future. We can also leverage and extend our acquisition success by institutionalizing proven best practices. A careful look at many of our past successful programs reveal common threads such as leveraging proven designs and platforms, and introducing payload enhancements incrementally into programs of record.

We will continue to implement evolutionary acquisition techniques using proven best practices to control costs and achieve reliable and consistent acquisition results. We will use multi-vehicle purchases for production stability, coupled with investments in new capabilities, while sustaining factory and satellite constellation health to improve cost and acquisition efficiency. The evolutionary acquisition practices could help stabilize our industrial base and allow us to acquire satellites more efficiently.

#### **NRO CONTRIBUTIONS: CRITICAL TO THE FIGHT**

Lastly, I would like to highlight the real bottom line for the NRO---our support to the warfighter. More than a decade after the attacks of September 11<sup>th</sup>, the NRO continues to contribute everyday to ongoing operations around the globe. We currently have more than 55 personnel deployed around the globe in direct support of the warfighter to ensure we're rapidly adapting to the needs and changing threats to our Nation and the men and women in harm's way.

In 2011 alone, NRO provided extremely valuable intelligence supporting more than 15 operations to capture or kill high value targets in combat areas. In addition, NRO supported more than 120 tactical operations locating Improvised Explosive Devices, helping to prevent the most lethal attacks against our ground combat forces. These tactical support operations also included support to ground and air tactical actions; counter-terrorist actions; and maritime anti-piracy/interdiction. We also provided vital overhead support to 17 critical Combat Search and Rescue missions. In addition to ground combat operations support, NRO supported 33 Strait of Hormuz transits ensuring U.S. Naval Forces had the intelligence assistance needed for safe passage.

In both the U.S. Central and African Command Areas of Operations, NRO has developed and deployed more than 25 reference emitters which have been used over 13000 times, and

provided a significant enhancement in our ability to geo-locate surface to air missile radar systems. This new capability has allowed U.S. and Coalition military forces to be extremely precise in targeting these significant threats.

The NRO's Ground Enterprise Directorate has recently fielded highly advanced, state-of-the-art systems that have significantly increased the relevance and value of time-sensitive data and products for Combatant Commanders. Ongoing counter-insurgency and counter-terrorism activities have underscored the tremendous impact of these systems in support of combat operations throughout the Eastern Hemisphere. As such, the warfighters' demand for time-sensitive products and data has dramatically transformed both the Intelligence Community production center's and their customer base. NRO has responded with an accelerated fielding of these ground systems that can quickly support finding and alerting potential insurgent events and meeting United States Central Command (USCENTCOM) requirements for near-real-time situational awareness of the battlespace.

In addition to rapidly developing and deploying capabilities in support of the warfighter, the NRO is also proactively involved with pre-deployment defense and intelligence training initiatives to include integration into core curricula at the Army's Intelligence Center of Excellence

at Fort Huachuca, Arizona. Our NRO Mobile Training Teams provided the Army's I Corps and III Corps with training on National Intelligence capabilities available in theater

#### **CONCLUSION**

The people of the NRO embody our core values of Integrity and Accountability, Teamwork Built on Respect and Diversity, and Mission Excellence. It is our highly skilled personnel who ensure we attain the NRO vision of "Vigilance From Above" by executing our mission to provide, "Innovative Overhead Intelligence Systems for National Security." Driven by our extraordinary people, the NRO will continue on the path of delivering acquisition and operations excellence, as well as the unparalleled innovation that is the hallmark of our history and the foundation of our future. We encourage you to visit the NRO for detailed discussions on how our systems directly support the National security of the United States.

Mr. Chairman and members of the Committee, thank you for your continued support of the National Reconnaissance Office and the opportunity to appear before you today.



**Betty J. Sapp**  
**PRINCIPAL DEPUTY DIRECTOR OF THE NRO**

Ms. Betty J. Sapp was appointed the Principal Deputy Director, National Reconnaissance Office (PDDNRO) on April 15, 2009. As the PDDNRO she provides overall day-to-day management of the NRO with decision responsibility as delegated by the Director, NRO (DNRO). In the absence of the DNRO, she acts on the Director's behalf on all matters.

Ms. Sapp began her government career as a US Air Force officer in a variety of acquisition and financial management positions, including: business management positions in the NRO; as a Program Element Monitor at the Pentagon for the MILSTAR system; as Program Manager for the FLTSATCOM program at the Space and Missile Systems Center in Los Angeles; and as manager of a joint-service development effort for the A-10 engine at Wright-Patterson Air Force Base in Dayton, Ohio.

In 1997, Ms. Sapp joined the Central Intelligence Agency. She was assigned to the NRO where she served in a variety of senior management positions. In 2005 she was appointed the Deputy Director, Business Plans and Operations, where she was responsible for all NRO business functions, including budget planning, current year financial operations, contracting, financial statements, business systems development, cost estimating, and legislative affairs.

In May 2007, Ms. Sapp was appointed Deputy Under Secretary of Defense (Portfolio, Programs and Resources), Office of the Under Secretary of Defense for Intelligence. In this position, she was responsible for executive oversight of the multi-billion-dollar portfolio of defense intelligence-related acquisition programs, the planning, programming, budgeting and execution of the multi-billion dollar Military Intelligence Program, and for the technology efforts critical to satisfying both current and future war fighter needs.

Ms. Sapp holds a Bachelor of Arts, and an MBA, Management, both from the University of Missouri, Columbia. She is also Level III certified in Government Acquisition and was certified as a Defense Financial Manager.

Ms. Sapp is a native of St. Louis, Missouri, and now resides in Alexandria, Virginia.



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**DOCUMENTS SUBMITTED FOR THE RECORD**

MARCH 8, 2012

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United States Department of State

Washington, D.C. 20520

MAR 8 - 2012

Dear Mr. Chairman:

Thank you for your letter of January 18 to President Obama regarding the Administration's recent decision to work with the European Union (EU) and other space-faring nations to develop a non-legally-binding *International Code of Conduct for Outer Space Activities*. The White House asked that we respond on the President's behalf.

The Administration made the decision to pursue a Code of Conduct because, as Secretary Clinton stated, "the long-term sustainability of our space environment is at serious risk from space debris and irresponsible actors" and "unless the international community addresses these challenges, the environment around our planet will become increasingly hazardous to human spaceflight and satellite systems, which would create damaging consequences for all of us." The Administration firmly believes that the development of voluntary best practices and transparency and confidence-building measures, such as a Code of Conduct, can help to promote safe and responsible operations in space and thus ensure continued U.S. access to, and use of, outer space for peaceful purposes.

The Code of Conduct would not be a treaty or international agreement that would impose legal obligations on the United States. Additionally, the Code of Conduct is not a legally-binding arms control agreement and the Administration has no plans to negotiate any arms control agreement related to space. The United States has subscribed to similarly non-binding multilateral codes in the past, such as the Hague Code of Conduct Against Ballistic Missile Proliferation, the Vienna Document, and the UN Debris Mitigation Guidelines. If the United States were to subscribe to a Code of Conduct and later determine that it was no longer in our national interest, the United States could unilaterally withdraw from, or suspend implementation of, the Code without legal consequence.

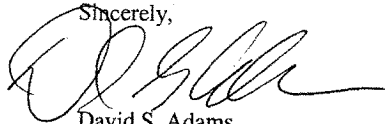
The Honorable  
Michael R. Turner, Chairman,  
Subcommittee on Strategic Forces,  
Committee on Armed Services,  
House of Representatives.

The Administration is committed to ensuring that any Code of Conduct will not limit, but rather further strengthen, our national security. The Department of Defense and the Intelligence Community have been, and will remain, fully involved in: the on-going U.S. interagency efforts to formulate U.S. government policy as it relates to a Code of Conduct; consultations and negotiations to develop a Code of Conduct; and a final decision on whether to subscribe to a Code. An interagency team recently briefed your staff on the Administration's Code-related efforts to ensure that all U.S. national security and intelligence equities are, and will be, protected.

The Code of Conduct is also in the strong interest of the U.S. commercial space industry. The Department of Commerce, Department of Transportation, and other relevant departments and agencies are also involved in the interagency discussions on the Code in order to ensure that industry perspectives are fully understood and considered, not only in connection with the development of a Code of Conduct, but also in regard to other key international activities such as the on-going work of UN Committee on the Peaceful Uses of Outer Space. Furthermore, through the Federal Aviation Administration's Commercial Space Transportation Advisory Committee (COMSTAC) and other forums, we are working closely with industry to ensure that a Code of Conduct can and will be implemented without adverse impacts. We look forward to continuing to receive industry's inputs as we continue with our negotiations with the EU and other nations on the development of a Code of Conduct.

We remain committed to keeping Congress fully informed about the status of our efforts to develop, and potentially subscribe to, an International Code of Conduct for Outer Space Activities.

Sincerely,

A handwritten signature in dark ink, appearing to read 'D. Adams', with a stylized flourish at the end.

David S. Adams  
Assistant Secretary  
Legislative Affairs

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**QUESTIONS SUBMITTED BY MEMBERS POST HEARING**

MARCH 8, 2012

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## QUESTIONS SUBMITTED BY MR. TURNER

Mr. TURNER. 1) General Shelton, if provided with the authorization and appropriation for the Efficient Space Procurement block buy of two Space Based Infrared Systems, what are the expected cost savings and the plan to reinvest those savings into modernization initiatives for future missile warning satellites? Further, how can we be assured those savings don't become a bill payer as seemed to happen to the AEHF savings in the FY13 budget request?

General SHELTON. 1) The staff of the Cost Assessment and Program Evaluation office in the Office of the Secretary of Defense estimates projected savings of \$521M through implementation of Efficient Space Procurement for Spaced Based Infrared Systems (SBIRS) Geosynchronous Earth Orbit Satellites 5 and 6. We applied \$289M of this savings across the Future Years Defense Program for the SBIRS modernization initiatives. The remaining projected savings were applied to higher DOD priorities. The SMI funding is set at an affordable level to produce and sustain current Program-of-Record systems and to invest in affordable alternatives for evolving current capability. The SMI plan is based on strategic guidance, an established architectural path, documented requirements and a solid program execution plan.

Mr. TURNER. 2) General Shelton, the GAO found that satellites, ground control systems, and user terminals in most of DOD's major space system acquisitions were not optimally aligned, leading to underutilized satellites and limited capability provided to the warfighter, in some cases for periods measured in years. What is DOD doing to address the synchronization problems, particularly with GPS M-Code user terminals, AEHF Family of Beyond the Line of Sight Terminals, SBIRS staring sensor, and Navy MUOS JTRS terminals? Has OSD or the Air Force measured the cost in terms of delay or inefficiencies? What is the plan to close these gaps and more efficiently plan to fully utilize the resources available?

General SHELTON. 2) The Air Force coordinates fielding schedules with Combatant Commands for all weapons systems. This interaction is critical toward mitigating the impact of capability delays, which cannot be quantified in terms of cost alone.

Air Force Space Command is focused on delivering advanced Positioning, Navigation and Timing (PNT), protected satellite communications, and missile detection/missile warning capabilities to the warfighter. In November 2011, the DOD approved an incremental acquisition strategy for the next generation of Military GPS User Equipment (MGUE) capable of exploiting the newest, most advanced military GPS signal. Current GPS enterprise acquisition schedules show the 24th Military-code capable satellite launching by FY18, with full rate production of the first units of Increment MGUE in FY17.

With the Advanced Extremely High Frequency (AEHF) program, synchronization is improving due to the successful upgrade of the Army's Secure Mobile Anti-jam Reliable Tactical Terminal and the Navy Multi-band Terminal. The Air Force is restructuring the Family of Beyond Line of Sight Terminals program. With this restructure, we are pursuing the highest priority terminals first to ensure protected communications for the air (E-4B and E-6B) and ground command post terminals with Presidential and National Voice Conferencing capabilities.

Finally, the first Space Based Infrared Systems (SBIRS) Geosynchronous Earth Orbit satellite is undergoing a rigorous operational certification process. Preliminary test results show the space vehicle is meeting or exceeding performance requirements. The staring sensor is undergoing preliminary calibrations—at the payload level, it is detecting targets 25% dimmer than expected and the data are being shared with the research and development and Technical Intelligence communities. The DOD funded initiatives, separate from the program of record, will deliver interim capabilities to process the data from the staring sensor in FY15/16. The sensor will contribute to the most stressing missile warning/missile defense performance requirements with full mission operations after acceptance of the final SBIRS Increment 2 ground system in FY18.

Mr. TURNER. 3) General Shelton, what is the purpose and value of the Counter Space Technology List (CSTL) developed by the State Department and the Aerospace Corporation? Should the CSTL be integrated into the export control reform process?

General SHELTON. 3) The Counterspace Sensitive Technology List (CSTL) is an ongoing research and analytical project, intended as a technical information aid to support export licensing and nonproliferation decisions. As such, we understand it is a proven reference tool. It was one of the many references used by the members of the Category XV Technical Working Group to develop and justify the technical performance parameters recommendations in the proposed update to United States Munitions List Category XV Spacecraft Systems and Associated Equipment published as Appendix 1 of the final 1248 Report. The Department of Defense, through the Defense Technology Security Administration, and other departments and agencies are working with the State Department to ensure the completeness of the CSTL.

Mr. TURNER. 4) The Operationally Responsive Space office is proposed for termination in the fiscal year 13 budget. Please explain why this program is being cancelled, what plans the Air Force has to sustain the ORS mission and how this will provide more responsive and timely space capabilities to the warfighter?

General SHELTON. 4) We plan to restructure the ORS program to incorporate the ORS tenants of responsiveness and resiliency across our space programs, to include programs such as the Advanced Extremely High Frequency Satellite, Space Based Infrared Systems, Global Positioning System III Operational Control Segment, Space Control Technology Insertion, and Technology Transfer programs. Beginning in 2013, we plan to meet warfighter needs for responsive space capabilities through programs of record and mechanisms such as the Joint Urgent Operational Needs process.

The Space and Missile Systems Center's Space Development and Test Directorate is sustaining the ORS-1 space vehicle and ground components through the life of the system—with approximately \$7M/year of Overseas Contingency Operations funds.

Mr. TURNER. 5) The Space Test Program has been a national capability relied on by laboratories and universities since 1965. Many critical space-based programs, such as GPS, have their origins in technology that was launched on STP missions. Please explain why the Department is requesting to cancel this critical program that provides the seed corn for future capabilities. Is there any other R&D organization that performs the mission of STP, integrating and launching payloads across the Department and coordinating experiments to fly aboard the International Space Station? Further, did the Air Force coordinate with the affected Government laboratories and organizations so they could properly plan for this in the FY 13 budget request?

General SHELTON. 5) The Space Test Program funding was eliminated due to higher Department of Defense priorities. We are coordinating with affected agencies to ensure space experiment work continues under the auspices of the Defense Advanced Research Projects Agency, the Air Force Research Laboratory and other Service research laboratories.

Mr. TURNER. 6) The Secretary of Defense in the Annual Industrial Capabilities Report to Congress, dated September 2011, highlighted DOD's concern for the U.S. Liquid Rocket Propulsion Industrial Base (LRPIB), and specifically the Air Force Evolved Expendable Launch Vehicle (EELV) program's reliance on Russian engines. What are your perspectives on the need to invest in domestic liquid rocket engines for use on our critical National Security Space launch missions? What must be done and when in order to preserve the critical U.S. liquid rocket engine industrial base and the unique science and engineering capability that supports this industrial base?

General SHELTON. 6) The Air Force is operating engines designed decades ago. In many instances, these engines are operating near the upper-margin of the performance capabilities—this is a mission assurance concern.

We are pursuing several avenues to modernize rocket engine technology. First, we are looking toward design of an upper stage with increased performance margins. Second, the Air Force Research Laboratory is developing next-generation technologies to include a new, domestically produced hydrocarbon main engine for eventual incorporation into the existing launch vehicle fleet. Finally, we are monitoring the progress of civilian companies entering the commercial unmanned and manned spaceflight markets.

In addition, both the Air Force EELV acquisition and new entrant strategies contribute to the preservation of the LRPIB and the science and engineering capability supporting the industrial base. The steady-state procurement rates of the acquisition strategy fosters efficient execution and enables companies to retain workforce expertise, providing stability and predictability to the EELV program, and thus to the LRPIB. The New Entrant Strategy encourages competition, which also contributes to the LRPIB.



Mr. TURNER. 7) Should the launch schedule slip, as has historically been the case, how will the excess inventory the Air Force builds up effect competition from New Entrants? How much generally are the storage costs per booster, and who pays those costs?

General SHELTON. 7) Most upcoming Air Force launches are recurring flights for programs that have already launched satellites supporting their respective missions; therefore, these satellites are very similar, if not identical, to their predecessors. This reduces the chance of development or production delays, and increases the likelihood these satellites will launch on schedule. We do not foresee a need to store launch vehicles. In addition, we are working the Atlas "white tail" concept to provide a common booster core for Atlas rockets, and the Delta Fleet Standardization to introduce a common RS-68 engine across all Delta IV variants. These two efforts will increase booster assignment flexibility and reduce launch delays.

Mr. TURNER. 8) What is the status of the new acquisition strategy for the Evolved Expendable Launch Vehicle, and what is the specific information that will be gathered to inform the final decision the block buy contract? What are the expected savings from the new strategy?

General SHELTON. 8) The EELV Acquisition Strategy, approved November 24, 2011, addresses the challenges of lowering costs while maintaining mission success through an annual booster commitment and infusing competition into the program. The success of this strategy is based on obtaining accurate information prior to contract award.

The FY13 Phase 1 Buy request for proposal requires United Launch Alliance to price both ranges in periods of performance, three to five years for hardware and up to seven years for capability, and quantities of six to ten "core" launch vehicles per year with the ability to launch eight to ten missions per year. This approach allows the government to balance launch vehicle production rate and length of commitment decisions. It enables the government to secure the best price per launch service (includes launch vehicle and associated launch support), and provides stability and predictability for the EELV program. Savings from the new strategy will depend on the delivered proposal and the final rate and quantity of launch services selected by the Air Force.

Mr. TURNER. 9) When do you assess that a new entrant will meet the established criteria for national security space EELV-class launches?

General SHELTON. 9) We expect at least one new entrant ready to compete for launches in the FY16-17 timeframe. The Air Force conducted a New Entrant Industry Day on December 1, 2011, with 100 attendees representing 15 aerospace companies and their affiliates and five government partners. Breakout sessions involved discussions with four potential new entrants. To date, the Air Force has received one Statement of Intent (SOI) for certification and we expect additional SOIs later this year. We are in the process of evaluating the SOI received and do not have a projected certification date yet.

No new entrant has a demonstrated capability to launch EELV-Class payloads. To facilitate the certification of potential new entrants, the Air Force identified two opportunities on which new entrants may bid: the Space Test Program-2 and the Deep Space Climate Observatory. These EELV-class missions will provide an opportunity for potential new entrants to prove their capability for certification. The certification timeline depends on the new entrants; specifically, their technical progress, the quality and sufficiency of the data they provide and a successful flight history. The Air Force is committed to certifying new entrants for EELV launches as soon as feasible.

Mr. TURNER. 10) GAO recently released its annual report on duplication, overlap, and fragmentation and reported that "Space launch acquisition processes for NASA and DOD are not formally coordinated, duplicate one another, and may not fully leverage the Government's investment because the Government is not acting as a single buyer." Please identify cost savings opportunities and identify what is being done to reduce duplication and leverage investments?

General SHELTON. 10) The Air Force is collaborating with NASA to find common solutions for launch needs. In 2010, NASA and the Air Force conducted a joint study to assess the feasibility of a mutual liquid oxygen and kerosene engine for EELV and the Space Launch System. The Liquid Propulsion Steering Group was created in February 2012 to act as an advisory board responsible for integrating Air Force liquid rocket propulsion requirements with the propulsion needs of external organizations and agencies. We are incorporating NASA's engine requirements for a Cryogenic Propulsion Stage as we explore options for replacing the EELV upper stage engine. At the technical level, we are active participants in each other's design reviews, and DOD and NASA are working together on the FY12 National Defense Authorization Act National Rocket Propulsion Study.

Mr. TURNER. 11) There are potential program areas where the DOD and NASA may have common or similar requirements for evolving space launch capabilities. These include high-thrust liquid oxygen—kerosene rocket propulsion systems/boosters for use on next-generation EELV and NASA's Space Launch System (SLS) Advanced Booster. How have the DOD and NASA collaborated toward establishing common requirements whereby a common liquid booster could be established for use on both programs? Are there active efforts between the DOD and NASA to coordinate Research and Development roadmaps so that maximum space launch benefits can be obtained? If yes, please describe some examples of these coordinated actions and ongoing collaborations.

General SHELTON. 11) The Air Force continues to collaborate with NASA to find common solutions for launch needs. In 2010, NASA and the Air Force collaborated on an extensive study to assess the feasibility of a mutual liquid oxygen and kerosene engine for EELV and the Space Launch System. In February 2012, the Liquid Propulsion Steering Group was created to act as an advisory board responsible for integrating Air Force liquid rocket propulsion requirements with the propulsion needs of external organizations and agencies. We are incorporating NASA's engine requirements for a Cryogenic Propulsion Stage as we explore options for replacing the EELV upper stage engine. At the technical level, we are active participants in each other's design reviews, and DOD and NASA are working together on the FY12 National Defense Authorization Act National Rocket Propulsion Study.

Mr. TURNER. 12) What is DOD doing, or planning to do, to define and assess its mission assurance costs and activities, and to what extent will the new acquisition strategy protect against overly high launch vehicle prices compared with mission assurance changes/efficiencies resulting from these assessments? Further, please outline how mission assurance for national security space missions differs from commercial space missions.

General SHELTON. 12) Mission assurance is a rigorous, continuous technical and management process employed over the life-cycle of a launch system to ensure mission success. There are two distinct facets to mission assurance. Integrated mission assurance is accomplished by the organizations involved in the launch vehicle design, production, testing and launch processing. Independent mission assurance, a crucial component of the success of National Security Space launches, is often identified with "mission assurance costs." This effort includes a number of technical reviews and analyses tailored for each mission, enabling a launch readiness independent assessment. It comprises less than 5% of the launch enterprise total costs, yet its value to the overall enterprise is hard to overstate. In fact, the Space Launch Broad Area Review, conducted just over ten years ago, recommended we return to in-depth mission assurance following a series of launch failures.

The Air Force will continue to encourage efficiencies without impacting mission success. The current launch capability contract, signed June 2011, includes a mission success performance incentive ensuring focus on mission requirements and a cost control incentive motivating the contractor to find efficiencies within its operations.

The principal difference between mission assurance requirements for national security space missions and commercial missions is summarized by the impact realized by a launch failure. Most, if not all, commercial launches are privately insured, and launch failures represent lost revenue. National Security Space launches are indemnified by the U.S. Government, and launch failures represent a significant cost to the taxpayers, as well as the mission impact of the loss of that particular satellite—a loss that could take many years to overcome.

Mr. TURNER. 13) Does DOD plan to develop its own price estimates for varying block buy quantities and contract lengths, or will it solely rely on the price proposals from United Launch Alliance?

General SHELTON. 13) Yes. The Air Force will follow Federal Acquisition Regulation Part 15 negotiation processes to develop and negotiate fair and reasonable prices. Auditors from the Defense Contract Audit Agency will support the Air Force negotiation team. In addition, a joint team composed of the National Reconnaissance Office Cost Analysis Improvement Group and the Air Force Cost Analysis Agency is performing analyses of costs for the RS-68 main engine, RL-10 upper stage engine, systems engineering, program management and launch operations. Data gathered from these reviews will inform the Air Force negotiating position.

Mr. TURNER. 14) Can you discuss any Department efforts to establish a longer-term plan for MILSATCOM? What is the projected demand in narrowband, wideband, and protected communications and how does the Department plan to meet it? What is the Department doing to ensure it is procuring Ku-band commercial satellite communications in the most efficient manner?

General SHELTON. 14) In the near term, we are maximizing our use of Ku-band commercial satellite communications by using the Defense Information Systems Agency's Future Commercial Satellite Communications Services Acquisition contract. In the longer term, we have analyzed future demand for these capabilities based on approved Defense Planning Scenarios. We are now executing the third and final phase of the Resilient Basis for Satellite Communications in Joint Operations Study to determine the best architectures to meet the future demand. The architectures under consideration include combinations of traditional military communication satellite systems and those acquired through innovative commercial lease/buy opportunities.

Mr. TURNER. 15) What is the right balance of organic space capability and commercially leased or hosted capability? How much of our space capability is currently being provided by commercial providers? How can we increase the opportunities for hosted payloads to save costs and bring capability online more quickly?

General SHELTON. 15) In accordance with the 2010 National Space Policy, the Air Force is pursuing commercial space capabilities to the "maximum extent possible" when those capabilities meet our requirements and are cost-effective. We are investigating opportunities to augment military space capabilities such as environmental monitoring; Positioning, Navigation and Timing; space-based imagery; and launch with commercial services. In addition, the Space and Missile Systems Center's Hosted Payload Office is identifying cost-effective hosting opportunities in the commercial market and developing an efficient business approach and contract vehicle for hosted payloads. Their efforts will lead to recommendations for the future.

Mr. TURNER. 16) As the responsible steward of GPS, what does the Air Force see as the future of GPS in a fiscally constrained environment? What alternative methods and technologies are being evaluated to cost-effectively meet the GPS mission?

General SHELTON. 16) Air Force Space Command is moving forward with cost-efficient strategies while balancing warfighter needs and the mandate to preserve GPS as the world's Positioning, Navigation and Timing gold standard. We are pursuing studies in Ground Segment automation and dual manifest launches for manpower and launch cost savings. The Department of Defense's recent GPS Enterprise Modernization Analysis of Alternatives is on-going and will identify cost-effective capability modernization alternatives. In the longer-term, we are tracking innovative technology alternatives, such as terrestrial-based augmentation and highly-accurate inertial navigation, for potential inclusion into the GPS Enterprise as these technologies mature.

Mr. TURNER. 17) The Department requested only \$2M in FY13 for "Weather Satellite Follow-On" efforts, and projected no money after that in the Five Year Defense Plan. While we recognize that the Department is relying on the Defense Meteorological Satellite Program to meet its near-term needs, what is the longer term plan to meet this critical mission area?

General SHELTON. 17) The Air Force is extending Defense Meteorological Satellite Program (DMSP) operations until 2025 by transitioning to a single string orbit and launching the remaining two DMSP satellites in an on-demand basis. In preparation for a follow-on to DMSP, we are validating the future capabilities required and conducting a study to identify the optimum approach for the follow-on program.

Mr. TURNER. 18) We have heard a lot about the need for resiliency of our space systems. How do we measure resiliency of an architecture? Do we have a way to model resiliency to evaluate our current systems, their strengths and weaknesses and determine what is sufficient? Compare current systems to future concepts? What are the most important steps the U.S. needs to take in order to create space systems that are resilient to threats?

General SHELTON. 18) Resiliency of space systems can be measured by an architecture's ability to resist an attack by avoiding damage or degradation, absorbing damage but maintaining structure and key functions and reconstituting to pre-event status.

While the models for measuring resiliency for each space capability area differ, the Department of Defense does have a standard framework for assessing a functional architecture. This framework consists of identifying the anticipated threat, the minimum and desired levels of mission performance, the risk of not meeting these performance levels, the consequence to the mission of not meeting a given performance level and the duration over which a performance shortfall is tolerable.

In the past, the threats to our spacecraft were not as concerning, so National Security Space programs built robustness into individual systems. Due to the current and increasing future threats, our concepts for providing resilient architectures include disaggregating capabilities on multiple satellites, non-traditional orbital regimes, hosting payloads on other satellites and integrating allied nation space and cyberspace capabilities.

Mr. TURNER. 19) Discuss the progress of the Space Protection Program. What have been its accomplishments since its establishment in 2008 and, what space protection areas continue to need the greatest attention? What is your assessment of how the defense and intelligence community have worked together to support the activities of this office?

General SHELTON. 19) Since 2008, the Space Protection Program (SPP), a joint Air Force Space Command and National Reconnaissance Office Program, has energized the National Security Space community to implement strategies to improve resiliency and mission assurance. They delivered the Capabilities and Dependencies database, enabling United States Strategic Command (USSTRATCOM) to calculate the operational consequences of multiple space systems losses. In addition, several National Security Space programs have integrated protection capabilities into program baselines.

This year, marks the culmination of several major efforts. SPP is completing testing of techniques that will allow USSTRATCOM to ensure communications capabilities in a highly contested environment. They are also working with United States Pacific Command and USSTRATCOM to incorporate new Tactics, Techniques, and Procedures for enhancing deployed systems survivability. Furthermore, this summer, SPP will complete an effort with multiple Services and agencies to demonstrate the effectiveness of various defeat capabilities and laying the groundwork for integrating those capabilities into operational architectures.

The Department of Defense and Intelligence Community continue to work in close coordination to develop and improve mission assurance capabilities. Of note, SPP is integrating a set of Title 10 and Title 50 response options involving the entire protection community to endorse performance requirements for the Space Situational Awareness architecture in a representative threat environment. The results will be delivered in approximately three months. These efforts, along with an associated effort to better define Indications and Warning support to space operations, indicate the coordination in the National Security Space community is strong and productive.

Mr. TURNER. 20) What efforts and long-term planning is the Department engaged in to ensure its spectrum continues to be safeguarded in the future?

General SHELTON. 20) The Air Force is engaged in multiple efforts, internationally and nationally, to ensure we continue to provide spectrum access capabilities to the Joint fight. At the same time, we recognize spectrum also fuels consumer and business wireless services and provides economic benefits to the Nation.

Internationally, the Air Force was a key participant and contributor in the United States preparation for and attendance at the United Nation's International Telecommunications Union World Radio Communication Conferences (WRC). At WRC-12, significant gains were made regarding spectrum for unmanned aerial systems command and control, contributing toward congressionally directed efforts to integrate unmanned aircraft operations into the National Airspace System. The Conference also identified 300 additional megahertz of globally harmonized spectrum for radar use to support the development and operation of advanced synthetic aperture radars.

Nationally, the Air Force is heavily involved in the presidentially directed and National Telecommunications and Information Administration led effort to identify 500 megahertz of additional spectrum for broadband wireless use. Our approach is straightforward: if we can prevent impacts to Air Force capabilities, we will not oppose repurposing of spectrum. Preventing impacts is dependent upon the availability of alternate spectrum, payment of our costs through the Spectrum Relocation Fund, and the time required making the transition.

We are also working closely with the Office of the Secretary of Defense's Chief Information Officer on the development of a Department of Defense Long Term Spectrum Strategy to address how the Department will address the continuing pressures on our spectrum access.

Mr. TURNER. 21) What is the acquisition strategy for the Joint Space Operations Center Mission System (JMS) program? How will the strategy leverage existing investments in commercial and Government capabilities?

General SHELTON. 21) The JMS acquisition strategy leverages existing government off the shelf (GOTS) and commercial off the shelf (COTS) products to the maximum extent possible, producing a very cost-effective procurement process. The JMS Program Office conducted market research to identify and assess the existing government and commercial capabilities that meet the Joint Requirements Oversight Council-approved JMS requirements. No existing COTS solutions exist that will fully satisfy these requirements. The program office will procure appropriate COTS products that satisfy subsets of these requirements through fixed-price contracts and will use Multiple-award Indefinite Delivery Indefinite Quantity contracts to pro-

cure those capabilities needing additional development work to meet the remaining requirements.

Mr. TURNER. 22) What is the purpose and value of the Counter Space Technology List (CSTL) developed by the State Department and the Aerospace Corporation? Should the CSTL be integrated into the export control reform process?

Mr. SCHULTE. 22) The Counterspace Sensitive Technology List (CSTL) is an ongoing research and analytical project, intended as a technical information aid to support export licensing and nonproliferation decisions. As such, it has proven to be an invaluable reference tool. It was one of the many references used by the members of the Category XV Technical Working Group to develop and justify the technical performance parameters recommendations in the proposed update to USML Category XV Spacecraft Systems and Associated Equipment published as Appendix 1 of the final 1248 Report. DOD, through the Defense Technology Security Administration (DTSA), and other departments and agencies are working with the State Department to ensure the completeness of the CSTL.

Mr. TURNER. 23) What is the right balance of organic space capability and commercially leased or hosted capability? How much of our space capability is currently being provided by commercial providers? How can we increase the opportunities for hosted payloads to save costs and bring capability online more quickly?

Mr. SCHULTE. 23) The Counterspace Sensitive Technology List (CSTL) is an ongoing research and analytical project, intended as a technical information aid to support export licensing and nonproliferation decisions. As such, it has proven to be an invaluable reference tool. It was one of the many references used by the members of the Category XV Technical Working Group to develop and justify the technical performance parameters recommendations in the proposed update to USML Category XV Spacecraft Systems and Associated Equipment published as Appendix 1 of the final 1248 Report. DOD, through the Defense Technology Security Administration (DTSA), and other departments and agencies are working with the State Department to ensure the completeness of the CSTL.

Mr. TURNER. 24) We have heard a lot about the need for resiliency of our space systems. How do we measure resiliency of an architecture? Do we have a way to model resiliency to evaluate our current systems, their strengths and weaknesses and determine what is sufficient? Compare current systems to future concepts? What are the most important steps the U.S. needs to take in order to create space systems that are resilient to threats?

Mr. SCHULTE. 24) Resilience is the ability of an architecture to support the functions necessary for mission success in spite of hostile action or adverse conditions. An architecture is "more resilient" if it can provide these functions with higher probability, shorter periods of reduced capability, and across a wider range of scenarios, conditions, and threats. Resilience may leverage cross-domain or alternative government, commercial, or international capabilities.

This definition and an associated methodology were developed by the Department and reviewed by the Defense Space Council. The basic evaluation methodology relies on system-of-systems fault analysis against different types and levels of threats. This is then supplemented with performance satisfaction analysis to determine the degraded level of capability against any adverse circumstance. The on-going Resilient Basis for SATCOM (RBS) Study and Joint Overhead Persistent Infra-Red Space Trade Study (JOIST) are the first architectural-level studies to assess resilience.

As we look to the future, the most important steps we can take to enhance resilience are to adopt a payload-centric acquisition approach, coupled with greater international collaboration and smaller, simpler, more affordable, incremental, disaggregated mission satellites and hosted payloads. This more diverse, distributed, complex targeting approach denies adversaries the benefit of attack and imposes an unacceptable cost and complexity on their attack calculus.

Mr. TURNER. 25) Discuss the progress of the Space Protection Program. What have been its accomplishments since its establishment in 2008 and, what space protection areas continue to need the greatest attention? What is your assessment of how the defense and intelligence community have worked together to support the activities of this office?

Mr. SCHULTE. 25) The Space Protection Program (SPP) has made important recommendations on how to reduce certain vulnerabilities in key space systems/constellations and identified ways to maintain our strategic advantage. Since 2008, the SPP has provided threat assessments, expanding upon intelligence assessments to include engineering judgments, technical analysis of suspected threat systems, and concepts to mitigate certain threats. In addition, the SPP supported development of the National Security Space Strategy, the Space Protection Strategy (SPS), which identifies protection priorities, and other key efforts in the department.

We remain focused on multiple mission priorities, including efforts to enhance the resilience of our Missile Warning, ISR, and Communications architectures. DOD worked collaboratively with the Intelligence Community (IC) to establish the SPP, and we continue to work with the Director of National Intelligence (DNI) to assess the scope, functions, organization, and resources of the SPP, with a view towards building an enduring organization for resilience and mission assurance, increasing its effectiveness across the U.S. space enterprise, and integrating a closer working relationship among DOD, the IC, and civil agencies.

Mr. TURNER. 26) What efforts and long-term planning is the Department engaged in to ensure its spectrum continues to be safeguarded in the future?

Mr. SCHULTE. 26) The use of the electromagnetic spectrum continues to be a critical enabler of our warfighting capabilities. We are sensitive to the competing spectrum demands resulting from the Department's increasing reliance on spectrum-dependent technologies and the rapid modernization of commercial mobile devices on a national and international scale. Recognizing that the demand for spectrum will continue to increase, the Department has long-term initiatives aimed at using and managing our spectrum more efficiently, identifying and investing in spectrally efficient technologies that afford us combat advantages, and advancing the interoperability of spectrum use and management with our coalition partners, and with Federal, State, and commercial entities.

Mr. TURNER. 27) The GAO found that satellites, ground control systems, and user terminals in most of DOD's major space system acquisitions were not optimally aligned, leading to underutilized satellites and limited capability provided to the warfighter—in some cases for periods measured in years. What is DOD doing to address the synchronization problems, particularly with GPS M-Code user terminals, AEHF Family of Beyond the Line of Sight Terminals, SBIRS staring sensor, and Navy MUOS JTRS terminals? Has OSD or the Air Force measured the cost in terms of delay or inefficiencies? What is the plan to close these gaps and more efficiently plan to fully utilize the resources available?

Mr. KLINGER. 27) Synchronization of schedules between space and ground components is recognized as an issue that limits some users from fully utilizing on-orbit capabilities. Launch schedules are such that the space components are required to maintain current capabilities while also affording enhanced capabilities requiring expanded ground processing or alternative user equipment in some cases. The Department is currently assessing ways to more efficiently bring ground component utility to more optimal levels. The following address the specific systems identified.

The Air Force is focused on delivering new Positioning, Navigation and Timing (PNT) capabilities as quickly and cost effectively as possible. Providing a new PNT capability, such as military-code (M-code), to warfighters requires populating the GPS constellation with modernized satellites (GPS IIR-M, IIF & III), fielding a control segment capable of providing C2 of new capabilities (OCX), as well as providing DOD GPS users with an industrial base to acquire M-code capable GPS receiver technology (MGUE). By FY18, the GPS constellation will be populated with the 24th M-code satellite, OCX will have transitioned to operations and sufficient development and operational testing and evaluation will have been accomplished to support a Full Rate Production decision for fielding MGUE.

The Department has struggled to deliver the FAB-T program and synchronize with the AEHF satellite to take advantage of the new capabilities. The first AEHF satellite achieved orbit last year and is completing operational check out. We are in the process of restructuring the FAB-T program to reduce continued cost and schedule risk and now expect to deliver the first FAB-T in FY15. The restructure includes putting an alternate source for the highest priority capabilities, especially those on command and control platforms, on contract in 2012 to address development schedule risk. The restructure also includes conversion of the current development contract to a fixed price contract for the development, and fixed price options for production.

Other AEHF terminals, the Navy Multiband Terminal (NMT), Air Force Minute-man MEECN Program Upgrade (MMPU) and Army Secure Mobile Anti-jam Reliable Tactical Terminal (SMART-T), are being fielded now, and will be able to utilize the full AEHF capability as soon as it becomes available for operational use. Since AEHF and all existing EHF terminals are also compatible with the legacy Milstar waveform, the AEHF satellite resources will be utilized when available. The operational cost is some users having to delay the migration to higher data rates and use of specific capabilities requiring the higher rates.

The space component of SBIRS GEO-1 is ahead of the ground in the use of both scanning and staring sensors. Scanners represent the legacy detection schema and retain a place in future on-orbit architectures. Staring sensors are a more robust

capability for which the current ground processing is being expanded and will be fully implemented by 2018. During the interim period the scanner data continue to be of use as a result of data processing efforts within the USAF.

Regarding MUOS, in July 2011 the USD(AT&L) directed a Red Team be established to determine the viability and probability of success of fielding the MUOS terminal/waveform capability. A goal of the Red Team was to assess the synchronization of the MUOS satellite and the JTRS ground terminal. The Red Team presented results of the assessment in November 2011 and USD(AT&L) directed they be implemented. A directive specifying timelines to accomplish Red Team tasks as well as determining service integration responsibilities is currently being reviewed by USD(AT&L).

Mr. TURNER. 28) The Operationally Responsive Space office is proposed for termination in the fiscal year 13 budget. Please explain why this program is being cancelled, what plans the Air Force has to sustain the ORS mission and how this will provide more responsive and timely space capabilities to the warfighter?

Mr. KLINGER. 28) With the successes of the Operationally Responsive Space (ORS) programs, the Department decided to incorporate the concept of operationally responsive space into the Air Force Space & Missile Systems Center (SMC) to increase resiliency, survivability and flexibility across all DOD space programs.

Transition efforts are underway to fully integrate responsive space principles into space architectures and Space Modernization Initiatives to:

- Develop enablers to ensure resilience, survivability and flexibility
- Explore space mission augmentation options
- Incorporate responsiveness into Research and Development (R&D) efforts across other platforms
- Integrate lessons learned from ORS accomplishments.

By integrating responsive space into the mission area platforms in both R&D and acquisition practice, the Department will continue to provide responsive and timely space capabilities to the warfighter.

Additionally, the Joint Staff has an extremely responsive and proven Joint Urgent Operational Needs (JUON) and newer Joint Emergent Operational Needs (JEON) process which will continue to provide responsive capabilities to Combatant Commander urgent needs.

Mr. TURNER. 29) The Space Test Program has been a national capability relied on by laboratories and universities since 1965. Many critical space-based programs, such as GPS, have their origins in technology that was launched on STP missions. Please explain why the Department is requesting to cancel this critical program that provides the seed corn for future capabilities. Is there any other R&D organization that performs the mission of STP, integrating and launching payloads across the Department and coordinating experiments to fly aboard the International Space Station? Further, did the Air Force coordinate with the affected Government laboratories and organizations so they could properly plan for this in the FY 13 budget request?

Mr. KLINGER. 29) Current fiscal constraints have resulted in the need to terminate STP in order to reallocate funding to higher priorities. While no other organization currently provides DOD-wide space access services or coordinates DOD experimentation aboard the International Space Station, spaceflight opportunities, both dedicated and rideshare, will still be available to the DOD science and technology community. Additionally, the DOD Joint Capability Technology Demonstration Program has several space capabilities and launch demonstrations planned.

DOD organizations will continue to invest in research and development of advanced space technologies, and will develop and fund their own space-access means and capabilities. While the desired coordination with affected government laboratories and organizations did not occur due to time constraints during the final balancing of the President's Budget. The FY13 budget request includes funds for STP to operate throughout FY13 and the Department is coordinating an approach to provide future space access for DOD experiments.

Mr. TURNER. 30) To account for the Space Test Program termination, are the budgets for the laboratories across the Department being increased, in the FY13 PB and the FYDP, to account for the expanded mission of launching their payloads? If so, by how much? If not, how will this ongoing requirement be met in the future?

Mr. KLINGER. 30) Budgets for DOD laboratories were set independently from the STP termination decision. The Air Force Research Laboratories, Naval Research Laboratories, Army Space and Missile Defense Command, Defense Advance Research Project Agency, National Reconnaissance Office, and other DOD organizations will continue to make significant investments in space related research, including the space access costs.

Mr. TURNER. 31) The Secretary of Defense in the Annual Industrial Capabilities Report to Congress, dated September 2011, highlighted DOD's concern for the U.S. Liquid Rocket Propulsion Industrial Base (LRPIB), and specifically the Air Force Evolved Expendable Launch Vehicle (EELV) program's reliance on Russian engines. What are your perspectives on the need to invest in domestic liquid rocket engines for use on our critical National Security Space launch missions? What must be done and when in order to preserve the critical U.S. liquid rocket engine industrial base and the unique science and engineering capability that supports this industrial base?

Mr. KLINGER. 31) There are several reasons why it is urgent that we readdress our current investment in liquid rocket engines. First, the upper stage engine used on the Delta IV is no longer in production. We have a stockpile that will last several years, but we must restart the line or replace this engine. Atlas V uses a similar upper stage that, although still in production, is also scheduled to stop production. The Department needs to collaborate with the United Launch Alliance to determine the way-ahead. Resolution of continued upper stage liquid rocket engine availability is most urgent.

Second, as you noted, we depend on the Russians to provide RD-180 boost engines for the first-stage of the Atlas V; this approach has obvious concerns. Investment in development of a domestically-produced, hydrocarbon-fueled, staged-combustion boost engine with similar or better performance than the RD-180 would eliminate this dependency and give a much-needed injection of capital to our liquid rocket engine industrial base. We mitigate this dependency today with a stockpile of RD-180 engines to allow us sufficient time to react, if needed. The DOD and NASA are collaborating on a study of liquid rocket engine alternatives for both first- and upper-stage that was commissioned by the Deputy Secretary of Defense. The DOD will use the results of this study to inform budget requests that will be sent to the Congress for FY 2014. NASA intends to leverage the results of this study in their own roadmap, which will be expressed in the National Rocket Propulsion Strategy.

Mr. TURNER. 32) Should the launch schedule slip, as has historically been the case, how will the excess inventory the Air Force builds up effect competition from New Entrants? How much generally are the storage costs per booster, and who pays those costs?

Mr. KLINGER. 32) Our analysis of satellite readiness for launch indicates that the rate of 6–10 cores per year over 3–5 years that is anticipated under the Air Force EELV acquisition strategy is insufficient to meet the expected demand. Although we have experienced launch delays in the past, circumstances that led to lower than expected launch rates no longer exist. We are entering a period during which several National Security Space programs that involve constellations of satellites are now in full-scale production, so we anticipate a full launch manifest for the foreseeable future.

The Department's contractor does not produce or store excess launch vehicles. They acquire some long-lead materials and stockpile them at their expense, but the factory adjusts production to match confirmed deliveries to the launch site as the satellites arrive for integration and launch preparation. If an already-ordered launch were indefinitely delayed, the factory would adjust production to match the revised manifest and any cores already in production for the delayed launch would be reassigned to the next suitable mission.

Mr. TURNER. 33) What is the status of the new acquisition strategy for the Evolved Expendable Launch Vehicle, and what is the specific information that will be gathered to inform the final decision the block buy contract? What are the expected savings from the new strategy?

Mr. KLINGER. 33) The EELV acquisition strategy was approved by the Air Force Acquisition Executive on November 24, 2011, and the Air Force released a request for proposal March 23, 2012 requesting cost proposals that cover a range of launch rates and durations. From that data and our own independent analysis, the Department will award the first block-buy contract at the rate, duration, and with termination conditions that, together, offer the most advantageous terms to the Government. Actual savings will not be known until we receive and assess the proposal later this summer.

Mr. TURNER. 34) When do you assess that a new entrant will meet the established criteria for national security space EELV-class launches?

Mr. KLINGER. 34) Only one potential new entrant, the Space Exploration Technologies Corporation (SpaceX), has stated an intention to qualify for future National Security Space (NSS) launch missions, and based on their current DOD- and NASA-funded launches, combined with their commercial launches and assuming the success of these missions, we expect them to achieve certification to compete for future



NSS missions by 2017. SpaceX has said they will be certified by 2014. Their estimate assumes no anomalies, which would be a first for a new launch vehicle (Falcon 9D), and this forecast does not take into consideration additional mission assurance measures that SpaceX will be required to implement throughout their supply and construction chain before they can be awarded an EELV-class launch mission.

Mr. TURNER. 35) GAO recently released its annual report on duplication, overlap, and fragmentation and reported that “Space launch acquisition processes for NASA and DOD are not formally coordinated, duplicate one another, and may not fully leverage the Government’s investment because the Government is not acting as a single buyer.” Please identify cost savings opportunities and identify what is being done to reduce duplication and leverage investments?

Mr. KLINGER. 35) As the DOD’s lead for National Security Space (NSS) launches, the Air Force manages the NSS launch manifest and launch service acquisitions in coordination with NASA to leverage our combined buying power and acquire the best contract terms for the U. S. Government (USG). The DOD believes the USG launch customer community (DOD, NRO, and NASA) should collectively negotiate the number of launch vehicles and services based on the total USG demand to achieve an economy of scale. The DOD and NRO, for example, have an existing memorandum of understanding and collectively procure launch services with DOD, specifically Air Force Space Command, acting as the lead agent. Current policy encourages agencies to use another agency’s contract vehicle if the scope and terms of the providing agency’s contract meet the supported agency’s needs. However, NASA awarded the Launch Services II contract to meet their specific space launch requirements, which are not the same as the NSS requirements.

Mr. TURNER. 36) There are potential program areas where the DOD and NASA may have common or similar requirements for evolving space launch capabilities. These include high-thrust liquid oxygen—kerosene rocket propulsion systems/boosters for use on next-generation EELV and NASA’s Space Launch System (SLS) Advanced Booster. How have the DOD and NASA collaborated toward establishing common requirements whereby a common liquid booster could be established for use on both programs? Are there active efforts between the DOD and NASA to coordinate Research and Development roadmaps so that maximum space launch benefits can be obtained? If yes, please describe some examples of these coordinated actions and ongoing collaborations.

Mr. KLINGER. 36) The Air Force is working with NASA to explore the potential of a partnership to develop a new upper-stage, liquid-fueled engine for use in both the Air Force’s Evolved Expendable Launch Vehicle (EELV) and NASA’s Space Launch System (SLS). Under the Integrated High Payoff Rocket Propulsion Technology program (or IHRPT), an Air Force-NASA project, a suite of physics-based modeling and simulation tools used to develop upper-stage engines has been deployed for use by the DOD and NASA. IHRPT also develops components for a staged-combustion, hydrocarbon-fueled main booster. The Air Force Research Laboratory at Edwards Air Force Base is scheduled to conduct a demonstration firing of a sub-scale prototype of an engine built with these components in FY 2020.

Building on these efforts, the DOD and NASA are collaborating on a study of liquid rocket engine alternatives for both first- and upper-stage that was commissioned by the Deputy Secretary of Defense. The DOD will use the results of this study to inform budget requests that will be sent to the Congress for FY 2014. NASA intends to leverage the results of this study in their own roadmap, which will be expressed in the National Rocket Propulsion Strategy that the DOD is co-developing with NASA. The National Rocket Propulsion Strategy was directed in Section 1095 of the FY 2012 National Defense Authorization Act.

Mr. TURNER. 37) What is DOD doing, or planning to do, to define and assess its mission assurance costs and activities, and to what extent will the new acquisition strategy protect against overly high launch vehicle prices compared with mission assurance changes/efficiencies resulting from these assessments? Further please outline how mission assurance for national security space missions differs from commercial space missions.

Mr. KLINGER. 37) Mission assurance activities consume approximately 5% of the EELV program budget. Each launch is unique and only those activities that contribute to the reliability of each launch are funded. The Air Force reviews mission assurance activities annually to prune away any that do not materially contribute to reducing the risk associated with all launch missions.

The new EELV acquisition strategy seeks to control costs by achieving an economic order quantity, not through elimination of mission assurance measures.

Commercial space missions are profit driven endeavors. As such, they can buy down their financial risk through insurance or negotiate it to the developer by purchasing only assets on orbit. National Security Space (NSS) missions are not profit

driven, but rather seek to provide unique sensor, navigation, and communications capabilities to meet the needs of warfighters in combat or intelligence needs of national policy makers. In a few cases, we have purchased services from commercial vendors to fill gaps in NSS capabilities, namely; communications and commercial imagery. But, only in those unique instances does an NSS mission begin to resemble a commercial model. For most NSS missions, there is no replacement option for the unique capabilities provided by the payload, so we impose higher mission assurance standards to reduce the risk of launch for these missions. The savings that might be realized from reducing mission assurance activities is insignificant compared to the opportunity cost of losing a critical NSS payload.

Mr. TURNER. 38) The defense and intelligence user communities conducted a study in 2010 to jointly identify near-term ground investment opportunities that can lead to a more unified and interoperable Overhead Persistent Infrared ground architecture. What improvements are being made to capitalize on opportunities for data sharing and fusion? Can you identify any areas of improvement for the community to work more collectively on OPIR exploitation?

Mr. KLINGER. 38)—What improvements are being made to capitalize on opportunities for data sharing and fusion? Answer: The on-going acquisition of JOG solutions provides a premier example of Intelligence Community (IC) and Department of Defense (DOD) cooperation in transforming OPIR stovepipes into an interoperable OPIR enterprise for the National System for Geospatial Intelligence (NSG). JOG solutions will deliver several critical capabilities to take full advantage of the IC and DOD's OPIR systems. Most all of these solutions provide improved data product sharing and fusion.

Commitment and support to JOG at all levels continues to be outstanding. JOG acquisition realized a major milestone when the senior leaders of the IC and DOD agencies partnering in JOG committed their full support. This strong collaboration led to a JOG Memorandum of Agreement, signed by the Directors, National Geospatial-Intelligence Agency (NGA) and Missile Defense Agency (MDA), and the Secretary of the Air Force on 30 September 2011. The JOG team received Phase-B-equivalent approval from the Joint (Under Secretary of Defense for Acquisition, Technology, and Logistics and Assistant Director of National Intelligence for Acquisition, Technology, and Facilities) Intelligence Acquisition Board on 5 October 2011.

Almost all the JOG solutions enable data sharing and fusion. Of the 23, seven materiel solutions are receiving initial funding in FY12: Mission Scheduling, OPIR Enterprise Mission Management (OEMM), Real-time Transfer Service (RTS), Space Based Infrared System (SBIRS) Wideband Data Distribution, Data Standards Development, Fast-Frame Processing for Battlespace Awareness/Space Situational Awareness Reporting (BA/SSA), and Joint Operations for BA/SSA. All seven enable data sharing and fusion.

JOG solutions are grouped into three packages with deliveries scheduled for FY14, FY17, and FY20. Several solutions provide initial capabilities in early deliveries, with full capabilities in later deliveries. In addition to the seven solutions previously mentioned, the following capabilities also support data sharing and fusion: OPIR Real-time Message Formats, Real-time Web Reporting, and Full Frame Processing for Missile Defense, Joint OPIR Data Archive, Cobra Brass-F and SBIRS Geolocation Accuracy Improvements, and Enhanced Scene-based Products.

—Can you identify any areas of improvement for the community to work more collectively on OPIR exploitation? Answer: The IC and DOD communities' team on establishing joint OPIR policy through the recurring OPIR Working Group. Operationally, the two collaborate through the Joint OPIR Planning Cell. We look forward to USSTRATCOM formally approving the implementation of the Joint OPIR Priority Framework, which will provide unified priority guidance for DOD and IC tasking of OPIR satellites. Additionally, USSTRATCOM and NGA continue to collaborate on defining OPIR support to the BA capability, which will further support the acquisition of JOG solutions.

Summary: JOG represents a major step forward for OPIR development and integration into the NSG. Solutions will provide users with new, high-value capabilities and support the delivery of an interoperable OPIR ground architecture for the joint IC and DOD community. NGA, Air Force, and MDA collaboration to acquire these solutions is outstanding; the team is off to a good start delivering OPIR capabilities that better serve all our OPIR users.

Mr. TURNER. 39) Can you discuss any Department efforts to establish a longer-term plan for MILSATCOM? What is the projected demand in narrowband, wideband, and protected communications and how does the Department plan to meet it? What is the Department doing to ensure it is procuring Ku-band commercial satellite communications in the most efficient manner?

Mr. KLINGER. 39) Question 1: Can you discuss any Department efforts to establish a longer-term plan for MILSATCOM?

Answer: The Department of Defense Fifteen-Year Defense Space Systems Investment Strategy for Fiscal Years 2012–2026, August 16, 2011 is the Department's long-range space systems investment strategy. It is consistent with the FY 2012 President's Budget and reflects 2010 Quadrennial Defense Review, the 2010 National Space Policy and the 2011 National Security Space Strategy. The resilient and diversified approach to SATCOM capability acquisition offers operational flexibility in providing near-term surge needs as well as ensuring long-term availability of military communications in diverse wartime scenarios. Through ongoing studies and AoAs the Department is assessing the MILSATCOM architecture and outlining a strategy for development/procurement of long-term MILSATCOM.

Question 2: What is the projected demand in narrowband, wideband, and protected communications and how does the Department plan to meet it?

Answer: The Department is currently assessing the projected demand for space communications assets. Resource Management Decision 700, 25 January 2011, tasked the Executive Agent for Space, in coordination with the Under Secretary of Defense (USD) for Acquisition, Technology and Logistics, USD (Intelligence), Assistant Secretary of Defense (NII), Joint Staff, United States Strategic Command, Director Cost Assessment and Program Evaluation, Director National Reconnaissance Office and the Military Services to conduct a study to assess the future of satellite communications in context of the National Security Space Strategy. This study encompasses the nuclear, contested and benign operating environments. This study's end-state objective is:

- A comprehensive cost/benefit (warfighting effectiveness metric) analysis across the span of alternatives associated with mitigating the gaps identified in the Joint Space Communications Layer Initial Capability Document.
- Identify preferred alternatives for near and long term needs.
- Fully consider cost, schedule and performance trades.
- Include a roadmap for transition from near to long-term solutions.

Question 3: What is the Department doing to ensure it is procuring Ku-band commercial satellite communications in the most efficient manner?

Answer: The Future Commercial Satellite Services Acquisition (FCSA) strategy (that includes all Ku band commercial satellite communications) has increased competition sevenfold, opening competition to more than 20 satellite vendors. We have already seen that this additional competition is providing better pricing. The transition for fixed satellite services (FSS) began last year, and mobile subscription services (MSS) transition begins this year. The government is in a better position today than yesterday in competing COMSATCOM requirements.

Mr. TURNER. 40) What is the right balance of organic space capability and commercially leased or hosted capability? How much of our space capability is currently being provided by commercial providers? How can we increase the opportunities for hosted payloads to save costs and bring capability online more quickly?

Mr. KLINGER. 40) As a consumer in the commercial satellite industry marketplace, DOD is engaged and proactive in formulating commercial satellite communication (COMSATCOM) investment and acquisition strategies to satisfy military operational requirements. Commercial leased or hosted capabilities have been an integral part of our SATCOM capability for years; leased COMSATCOM provides the predominance of CENTCOM communications, and is anticipated to continue while U.S. Forces remain active in the CENTCOM AOR.

In FY12, the Department directed the replacement of satellite communications leases purchased with Overseas Contingency Operations funds with a multiple option-year leases through the Defense Information Systems Agency's Future Commercial Satellite Communications Services Acquisition (FCSA). FCSEA Service Areas include: Custom end to end SATCOM solutions (CS2), "Plug-in" subscription services (\$/month, \$/minute, \$/MB), and higher transponder capacity.

The balance between COMSATCOM and MILSATCOM is based on the uniqueness of certain military requirements. Military requirements span a broad range, some of which are typical of commercial uses and some are atypical (e.g., jamming protection, anti scintillation, nuclear survivability, communications on the move (COTM)). For this reason, DOD space system acquisitions meet military requirements, while commercial space system acquisitions meet market demands, although some future commercial offerings may be beneficial to the wideband military market (e.g., commercial Ka band for support to disadvantaged users). International Traffic in Arms Regulations (ITAR) risks and proper DOD approvals must be considered before implementing any of these atypical, military-specific requirements on COMSATCOM.

Hosting DOD payloads on commercial satellites offer great potential to augment, diversify, reconstitute DOD capabilities, more frequently, and create resilience in an affordable way. However, there are several challenges we must overcome:

- In order to maximize opportunities in hosted payloads, a common interface standard must be instituted on all commercial satellites so that: (1) the DOD could rapidly host the payload on commercial launches to orbit locations of interest to the DOD, and (2) the DOD could compete the hosting of the payloads across multiple satellite operators.
- Commercial satellite orbit locations would require clearances to operate at frequencies assigned for military/government operations. In addition, ITAR issues may limit launch opportunities to U.S. owned or “friendly” foreign owned companies.
- Hosted payloads, by their nature, are tenants on a commercial satellite. The DOD would need assurances that the hosted payload would not be shut down if there were issues such that operating the hosted payload conflicted with the other revenue producing payloads on the satellite. Commercial Remote Sensing is provided through firm-fixed price Service Level Agreements. The balance between government and commercial systems is, once again, derived from the requirements which are either uniquely time-sensitive, military/intelligence or global, unclassified, shareable and delivered on-demand. Several challenges highlight the need to reevaluate the balance between government and commercial remote sensing:
  - Foreign industry’s momentum in providing increasingly greater electro-optical resolution
  - Foreign government-subsidized synthetic aperture radar and multi-spectral capabilities which do not exist in the U.S. commercial space industry
  - Increasing demand for full-motion video, as a result of the proliferation of unmanned aerial systems.

The future opportunities for commercial remote sensing will depend on the U.S. data providers’ ability to remain viable in the market place with an increasing number of competitors, not only from emerging space-faring nations, but with expanding capabilities of our Allies.

Mr. TURNER. 41) The Department requested only \$2M in FY13 for “Weather Satellite Follow-On” efforts, and projected no money after that in the Five Year Defense Plan. While we recognize that the Department is relying on the Defense Meteorological Satellite Program to meet its near-term needs, what is the longer term plan to meet this critical mission area?

Mr. KLINGER. 41) The Department is moving forward with an analysis of current and potential future capability gaps created in the wake of the recent Defense Weather Satellite System termination and the upcoming projected end-of-life for the DMSP. A Defense Space Council (DSC) study will be accomplished in order to inform a Material Development Decision in late July 2012 and provide input to frame an Analysis of Alternatives (AoA). The DSC study is also expected to be the basis for the Department’s request for funding in FY 2014 to support continued sensor development and risk reduction activities initiated with the \$125M Congress provided in the FY 2012 NDAA. The AoA will commence late in 4QFY12 and will inform budget submissions for FY 2015 and beyond.

Mr. TURNER. 42) We have heard a lot about the need for resiliency of our space systems. How do we measure resiliency of an architecture? Do we have a way to model resiliency to evaluate our current systems, their strengths and weaknesses and determine what is sufficient? Compare current systems to future concepts? What are the most important steps the U.S. needs to take in order to create space systems that are resilient to threats?

Mr. KLINGER. 42) The Department has defined space resilience. “Resilience is the ability of an architecture to support the functions necessary for mission success in spite of hostile action or adverse conditions. An architecture is ‘more resilient’ if it can provide these functions with higher probability, shorter periods of reduced capability, and across a wider range of scenarios, conditions, and threats. Resilience may leverage cross-domain or alternative government, commercial, or international capabilities.”

The Department has initiated integrating the resilience definition and we’re in the early stages of applying an evaluation methodology into space architecture development for overhead persistent infrared, wideband and protected communications, and space control. Promulgating the resilience definition and methodology throughout the Department’s processes will enable a common framework to make important trades between performance, affordability, and resilience.

The most important steps that the Department is undertaking to move towards space architectures innately more resilient to emerging threats are: 1) continuing efforts to enhance the resiliency and effectiveness of critical space-based capabilities, 2) continuing to work with domestic and international allies and partners, 3) invest in advanced capabilities to defend operational capability and improve resiliency in space.

Mr. TURNER. 43) Discuss the progress of the Space Protection Program. What have been its accomplishments since its establishment in 2008 and, what space protection areas continue to need the greatest attention? What is your assessment of how the defense and intelligence community have worked together to support the activities of this office?

Mr. KLINGER. 43) The Space Protection Program (SPP) has conducted several important analyses addressing certain vulnerabilities across space systems and constellations since its inception in 2008. The program has conducted engineering assessments and technical analysis of suspected threat systems to develop and recommend concepts to mitigate those threats. In addition, the SPP has supported analysis of several Air Force programs, making recommendations on technology transition and operational development to meet the threat baseline.

We remain focused on understanding the operating environment and response trade space to evolve vital space missions into a more resilient and integrated architecture. OSD is working with the DNI to assess the scope, functions, organization, and resources of the SPP to ensure we have an enduring organization for resilience, survivability, and space service assurance; and increase effectiveness across the U.S. space enterprise with close working relationships among DOD and IC.

Mr. TURNER. 44) What efforts and long-term planning is the Department engaged in to ensure its spectrum continues to be safeguarded in the future?

Mr. KLINGER. 44) The use of the electromagnetic spectrum continues to be a critical enabler of our warfighting capabilities. We are sensitive to the competing spectrum demands resulting from the Department's increasing reliance on spectrum-dependent technologies and the rapid modernization of commercial mobile devices on a national and international scale. Recognizing that the demand for spectrum will continue to increase, the Department has long-term initiatives aimed at using and managing our spectrum more efficiently, identifying and investing in spectrally efficient technologies that afford us combat advantages, and advancing the interoperability of spectrum use and management with our coalition partners, and with Federal, State, and commercial entities.

Mr. TURNER. 45) Is there a requirement for commercial imagery, and if so, what is it? How does the Department quantify the amount of commercial satellite imagery needed to support the requirements of the warfighter? How does the Department plan to address these needs? What is the longer-term plan?

Mr. KLINGER. 45) Yes there is a requirement for Commercial Imagery (CI). From the time commercial imagery satellite capabilities first became available, these capabilities have provided a valuable complementary source of imagery products to those obtained through National Technical Means (NTM). The current requirement includes products for imagery analysis that supplements information from NTM, as well as for Foundation Based Operations and Safety of Navigation (FBO/SoN) data. FBO/SoN products include data to develop and update aeronautical and maritime charts, maps, and other foundation data used both in intelligence reporting and operational planning documents. CI systems can fulfill the bulk of the FBO/SoN requirements, while high resolution NTM fulfill the bulk of detailed imagery for analysis supporting intelligence, targeting, and decision making by senior leaders. In reality, both CI and NTM can, and are, used to support the two mission areas to a limited extent depending on timeliness, mission and tasking priorities, and other operational constraints such as cloud cover. The overall demand for imagery continues to grow, and commercial imagery is an essential means to meet some of the demand. The commercial imagery contracts are negotiated to provide imagery volumes based on capacity of the commercial satellites and acceptable return on investment by the Department.

The Department is currently refining its approach to addressing these needs by conducting a joint USD(I)-ODNI led Commercial Imagery Study that assesses satisfaction of the existing demand for Commercial Imagery. The Department will use the results from this analysis effort to ensure both DOD and ONDI are making the optimized, affordable investment to satisfy the warfighter needs to the greatest degree possible. The final report is due out in late April to OMB. Additionally, the Joint Staff J-8 is performing a consolidated ISR Study that includes an assessment of Commercial Imagery requirements which will determine to what degree military CI requirements are being met today, as well as those anticipated in the near term.

The longer term plan is for the Department to continue to work closely with the DNI to ensure the USG can meet the needs of the warfighter through an optimum balance of investments in both NTM and CI. The CI investments in future years will be thoroughly analyzed against all other mission priorities within the Department and resourced appropriately.

Mr. TURNER. 46) What is the purpose and value of the Counter Space Technology List (CSTL) developed by the State Department and the Aerospace Corporation? Should the CSTL be integrated into the export control reform process?

Ms. SAPP. 46) The National Reconnaissance Office (NRO) is not a key participant in developing the CSTL; respectfully defer this question to the State Department.

Mr. TURNER. 47) The Defense Space Council, established last year, was designed to provide strategic guidance, planning, and architecture assessment. From the perspective of the NRO, can you describe how the Defense Department and Intelligence Community are cooperating, conducting planning, and leveraging investments?

Ms. SAPP. 47) The NRO continues to collaborate with the Department of Defense (DOD) and Intelligence Community (IC) in forums such as the Defense Space Council (DSC). One of the core functions of the DSC is to assess and guide requirements, plans, programs, and architectures within the DOD and to promote cooperation between Defense and Intelligence space sectors. This forum, and others such as the Joint Requirements Oversight Council, provides the IC and the DOD opportunities to synchronize activities of mutual interest. More specifically, there is considerable cooperation, planning, and leveraging of investments through the acquisition and annual budget processes. The DOD, the Director of National Intelligence and the functional managers for signals intelligence (National Security Agency) and geospatial intelligence (National Geospatial-Intelligence Agency) routinely work closely together to cooperate and conduct planning on those systems in acquisition, and proposed future systems to meet intelligence needs. In addition, during the annual budgeting process investment leveraging is performed through joint studies and also through jointly funded acquisitions where both the intelligence and defense communities benefit from dual investments in key capabilities.

Mr. TURNER. 48) When do you assess that a new entrant will meet the established criteria for national security space EELV-class launches?

Ms. SAPP. 48) Based on continued interaction with National Aeronautics and Space Administration (NASA) and the Air Force, combined with our ongoing efforts with several new entrants, the NRO is encouraged by the development and looks forward to seeing new entrants compete for launches as early as Fiscal Year (FY) 2014. This progress is consistent with goals outlined in the new entrant strategy.

Mr. TURNER. 49) What is the NRO doing to determine the viability and readiness of new entrants performing launches for NRO missions?

Ms. SAPP. 49) In the past year, the NRO completed mission integration and security related studies with two new entrant providers (SpaceX and Orbital Sciences Corp). In concert with the Air Force, the NRO is awarding follow-on efforts to one new entrant provider (SpaceX) for defining integration requirements for the NRO Launch-79 (NROL-79) mission. The NROL-79 launch vehicle is currently scheduled for a FY 2017 launch date.

In addition to these early integration studies, the NRO is also participating, with NASA and the Air Force, in new entrant technical design reviews to better understand the new entrant providers' processes and designs.

Mr. TURNER. 50) GAO recently released its annual report on duplication, overlap, and fragmentation and reported that "Space launch acquisition processes for NASA and DOD are not formally coordinated, duplicate one another, and may not fully leverage the Government's investment because the Government is not acting as a single buyer." Please identify cost savings opportunities and identify what is being done to reduce duplication and leverage investments?

Ms. SAPP. 50) The Air Force is the executive agent for launch and NRO respectfully defers to them to respond to this question.

Mr. TURNER. 51) What is DOD doing, or planning to do, to define and assess its mission assurance costs and activities, and to what extent will the new acquisition strategy protect against overly high launch vehicle prices compared with mission assurance changes/efficiencies resulting from these assessments? Further please outline how mission assurance for national security space missions differs from commercial space missions.

Ms. SAPP. 51) This question is deferred to the DOD.

Mr. TURNER. 52) What is the right balance of organic space capability and commercially leased or hosted capability? How much of our space capability is currently being provided by commercial providers? How can we increase the opportunities for hosted payloads to save costs and bring capability online more quickly?

Ms. SAPP. 52) This question is deferred to the DOD.

Mr. TURNER. 53) We have heard a lot about the need for resiliency of our space systems. How do we measure resiliency of an architecture? Do we have a way to model resiliency to evaluate our current systems, their strengths and weaknesses and determine what is sufficient? Compare current systems to future concepts? What are the most important steps the U.S. needs to take in order to create space systems that are resilient to threats?

Ms. SAPP. 53) How do we measure resiliency of an architecture? Answer: (U//FOUO) Regarding NRO systems, resilience describes how the architecture responds to an unexpected disturbance (launch failure, counter space activities, mission disruption, etc.) So, resilience should provide the level of system adaptability to threat degradation and loss in terms of quickly NRO capabilities “bounce back” or recovers in collection capacity and how long it takes to do so—to include the time it takes the constellation to be re-optimized after a given loss or perturbation.

Do we have a way to model resiliency to evaluate our current systems, their strengths and weaknesses and determine what is sufficient? Answer: (U//FOUO) The NRO is developing modeling techniques to predict and visualize system performance. Research is ongoing to determine the best combination and use of these techniques. Key guiding principles include: interoperability, to support optimizing the collective response to threats; resiliency metrics inherently tied to architecture performance; and linking predictive awareness and resiliency.

Compare current systems to future concepts? Answer: (U//FOUO) The NRO is pursuing future architecture concepts that are both effective and resilient, while also consistent with cost constraints. Comparisons between specific current and future systems are classified, and can be discussed in a different forum.

What are the most important steps the U.S. needs to take in order to create space systems that are resilient to threats? Answer: (U//FOUO) Resiliency from an architecture perspective is by far the most creditable and cost effective approach to maintaining the flow of vital information from national systems. This is a holistic approach where future architectures are a dynamic resilient “system” capable of being reorganized to “buyback” mission capability under variable stressing conditions, thus preserving essential capability.

Mr. TURNER. 54) Discuss the progress of the Space Protection Program. What have been its accomplishments since its establishment in 2008 and, what space protection areas continue to need the greatest attention? What is your assessment of how the defense and intelligence community have worked together to support the activities of this office?

Ms. SAPP. 54) Since 2008, the Space Protection Program (SPP), a joint NRO and Air Force Space Command Program, has energized the national security space community to implement strategies to improve resiliency and mission assurance for military and national security space architectures. They delivered the Capabilities and Dependencies database, enabling United States Strategic Command to calculate the operational consequence of multiple space system losses. In addition, several national security space programs have integrated protection capabilities into program baselines.

The Intelligence Community and Department of Defense continue to work in close coordination to develop and improve mission assurance capabilities. Of note, SPP is integrating a set of Title 10 and Title 50 response options involving the entire protection community to endorse performance requirements for the space situational awareness architecture in a threat environment. They will deliver these results to the Director of the NRO, and the Commander of Air Force Space Command in three months. These efforts, along with an associated effort to better define indications and warnings support to space operations, indicate the coordination is strong and productive.

SPP will continue its efforts to better protect our space-enabled capabilities and to incorporate protection into the requirements processes and operational plans.

Mr. TURNER. 55) What efforts and long-term planning is the Department engaged in to ensure its spectrum continues to be safeguarded in the future?

Ms. SAPP. 55) This question is deferred to the DOD.

### QUESTIONS SUBMITTED BY MS. SANCHEZ

Ms. SANCHEZ. 56) Will sensors that can improve detection of a nuclear detonation be incorporated into the SIBRS satellite? Why/why not?

- What is the cost?
- When can we expect the report on this issue that is due to Congress?

General SHELTON. 56) The Department of Energy conducted a study to assess if more affordable United States Nuclear Detonation Detection System (USNDS) space and ground architectures are possible. Six options were analyzed, two of which involved hosting USNDS sensors on SBIRS, beginning with Geosynchronous Earth Orbit Satellite 7.

The study out-brief and decision process is underway.

Ms. SANCHEZ. 57) Could you give us your thoughts on the way forward for JMS and why this is an urgent need?

- Why is a developmental path that might be more expensive and take longer to develop being pursued when commercial-off-the-shelf capability may provide an earlier and cheaper solution? Are there any plans for testing commercial capability?

General SHELTON. 57) Our legacy Space Situational Awareness processing system, the Space Defense Operations Center (SPADOC), is far beyond its useful life expectancy. Its limited capacity impairs our ability to conduct daily operations and it is not able to incorporate our next-generation sensors. These factors make the near-term replacement of SPADOC critical.

The JMS acquisition strategy leverages existing government off the shelf (GOTS) and commercial off the shelf (COTS) products to the maximum extent possible, producing a very cost-effective procurement process. The JMS Program Office conducted market research to identify and assess the existing government and commercial capabilities that meet the Joint Requirements Oversight Council-approved JMS requirements. No existing COTS solutions exist that will fully satisfy these requirements. The program office will procure appropriate COTS products that satisfy subsets of these requirements through fixed-price contracts and will use Multiple-award Indefinite Delivery Indefinite Quantity contracts to procure those capabilities needing additional development work to meet the remaining requirements.

Ms. SANCHEZ. 58) A piece of cloth that was left in the fuel line by the contractor during the manufacturing process led to a 14-month delay in AEHF reaching its intended orbit, which in turn caused delay to the next two AEHF satellite launches. While the total contract was worth nearly \$8 billion, the contractor's award fee was only reduced by \$19 million for this mistake. Prior to this problem, GAO reported that AEHF suffered a \$250 million cost overrun and 2-year delay in launch due to parts quality problems.

- To what extent is DOD and the Air Force considering using more effective incentives to reduce parts quality problems, especially considering the challenges and delays associated with getting the first AEHF satellite to its intended orbit?
- How does the Air Force quantify the cost of delays in procuring specific capability to the warfighter?

General SHELTON. 58) Following the launch of AEHF-1, the MILSATCOM Program Office restructured the prime contractor incentive plans for AEHF 1-4 and incorporated similar incentives in the AEHF-5/6 contract to be awarded later this year. These incentive plans address lessons learned from the AEHF-1 on-orbit anomaly, reflect an increased focus on cost control and account for the shift in program focus as it transitions from development to production. The plans ensure any additional costs associated with AEHF parts problems leading to contractor-induced schedule delays will have a negative impact to the contractor's fee.

Ms. SANCHEZ. 59) What will the cost savings be from entering into a fixed-price contract to procure two AEHF satellites (as part of its EASE approach) relative to the cost of procuring two such satellites separately? If so, what are the anticipated savings?

General SHELTON. 59) In 2009, Air Force Space Command estimated the cost of purchasing AEHF Space Vehicle (SV) 5 in FY12 and AEHF SV 6 in FY14 was \$1.95B per space vehicle. With the Office of the Secretary of Defense for Acquisition, Technology and Logistics approved acquisition strategy for an Efficient Space Procurement block-buy of AEHF SV 5/6, the estimated price for each space vehicle is \$1.55B. This approach has a potential savings of approximately \$400M per space vehicle.

Ms. SANCHEZ. 60) What do you see as the major challenges ahead?

General SHELTON. 60) Threats in the space domain are increasing while our ability to maintain and improve foundational space capabilities to meet warfighter requirements is challenged by resource constraints. Threats range from environmental



factors, such as the increasing volume of orbital debris, to deliberate actions by potential adversaries. Even in a declining budget environment, we must provide a foundational level of space capability if our Nation is to preserve its current ability to defend U.S. interests globally.

Ms. SANCHEZ. 61) We understand you have asked ULA to provide pricing over a range of scenarios from 6 boosters per year for 3 years up to 10 boosters a year for 5 years. How will the Government ensure that ULA's pricing is fair, reasonable, and accurate, given Defense Contract Auditing Agency and GAO's findings that ULA's cost information is often erroneous? Is the Air Force conducting an independent review of this information?

General SHELTON. 61) The Air Force will follow Federal Acquisition Regulation Part 15 negotiation processes to develop and negotiate fair and reasonable prices. Auditors from the Defense Contract Audit Agency will support the negotiation team. In addition, a joint team composed of the National Reconnaissance Office Cost Analysis Improvement Group and the Air Force Cost Analysis Agency is performing analyses of costs for the RS-68 main engine, RL-10 upper stage engine, systems engineering, program management and launch operations. Data gathered from these reviews will inform the Air Force negotiating position.

Ms. SANCHEZ. 62) What contracting structure will the Air Force pursue? Has Air Force determined a quantity or duration for the next EELV acquisition, and will this decision impact the request for FY13?

General SHELTON. 62) The EELV Acquisition Strategy, approved November 24, 2011, restructures the program to address the challenges of lowering costs while maintaining mission success and stabilizing the industrial base. It allows for the accumulation of sufficient pricing information supporting the Air Force decision on quantity and contract length and is based on multiple phases. The first phase request for proposal was released March 23, 2012. This phase begins in FY13 and involves an annual commitment of launch services with concurrent opportunities to certify new entrants. The request for proposal requires the contractor to provide prices for a range of quantities, from six to ten cores, over a contract period of three to five years. Specific decisions about unit quantities and contract duration are scheduled for summer 2012, allowing the Air Force the opportunity to balance contractual commitments with operational requirements, budget, cost reductions and the potential for competition. The FY13 Phase 1 Buy contract will include a cost-plus incentive fee provision for Launch Capabilities and a firm-fixed price provision for Launch Services. We project full and open competitions for the follow-on phases.

Ms. SANCHEZ. 63) Can you outline, specifically, the work product that is included in so-called mission assurance costs? Are there efficiencies the Air Force can achieve in this area?

General SHELTON. 63) Mission assurance is a rigorous, continuous technical and management process employed over the life-cycle of a launch system to ensure mission success. There are two distinct facets to mission assurance. Integrated mission assurance is accomplished by the organizations involved in the launch vehicle design, production, testing and launch processing. Independent mission assurance, a crucial component of the success of National Security Space launches, is often identified with "mission assurance costs." This effort includes a number of technical reviews and analyses tailored for each mission, enabling a launch readiness independent assessment. It comprises less than 5% of the launch enterprise total costs, yet its value to the overall enterprise is hard to overstate. In fact, the Space Launch Broad Area Review, conducted just over ten years ago, recommended we return to in-depth mission assurance following a series of launch failures.

The Air Force will continue to encourage efficiencies without impacting mission success. The current launch capability contract, signed June 2011, includes a mission success performance incentive ensuring focus on mission requirements and a cost control incentive motivating the contractor to find efficiencies within its operations.

Ms. SANCHEZ. 64) What is the current backlog of Air Force booster cores purchased from ULA for 35 missions that have not yet launched? Given this backlog of orders, why have prices increased so significantly?

General SHELTON. 64) Many factors contribute to the increasing costs of EELV boosters. Examples include buying boosters one at a time, production breaks, production rework, subsequent recertification, annual inflation and a reduced supplier business base (particularly from propulsion system suppliers). The backlog includes all missions from the National Security Space partners. The National Reconnaissance Office, Navy, Air Force, and Australia have 32 rocket booster cores on order to support 28 mission launches. This includes Delta IV Heavy missions which require more than one core. Of the 32 cores, 17 are in the production flow for launches in FY12 and FY13. Another 9 cores are projected to launch in FY14. The remaining

cores are projected to fly out by FY16, exhausting the backlog. The backlog does not affect the current vehicle pricing as the program's initial inventory of components and smaller follow-on lot quantity buys are being depleted.

Ms. SANCHEZ. 65) What types of "off-ramps" are you considering to the block buy, if/when a New Entrant is qualified?

General SHELTON. 65) To facilitate potential new entrant certification, we identified two missions on which new entrant launch providers may bid: the Space Test Program—2 and the Deep Space Climate Observatory. These Evolved Expendable Launch Vehicle class-missions will provide an opportunity for potential new entrants to gain satellite launch experience facilitating vehicle certification. Once a new entrant is certified, we will compete launch services not covered under the FY13 Phase 1 Buy. When this phase expires and new entrants are certified, we intend to conduct future acquisitions in a full and open competition for launch services.

Ms. SANCHEZ. 66) How will the cost of ULA launches versus new entrants be compared given that the Government is funding the ULA overhead?

General SHELTON. 66) Air Force Space Command is developing the competition approach for missions above the FY13 Phase 1 Buy contract amounts. If new entrants are certified when this period expires, the Air Force will conduct a full and open competition using an on-orbit pricing approach that aggregates all aspects of mission costs into firm-fixed-price contracts.

Ms. SANCHEZ. 67) Should the launch schedule slip, as has historically been the case, how will the excess inventory the Air Force builds up effect competition from New Entrants? How much generally are the storage costs per booster, and who pays those costs? Is the Air Force working with the contractors to decrease the cost of storage and ensure that the price is reasonable given the requirements?

General SHELTON. 67) Most upcoming Air Force launches are recurring flights for programs that have already launched satellites supporting their respective missions; therefore, these satellites are very similar, if not identical, to their predecessors. This reduces the chance of development or production delays, and increases the likelihood these satellites will launch on schedule. We do not foresee a need to store launch vehicles. In addition, we are working the Atlas "white tail" concept to provide a common booster core for Atlas rockets, and the Delta Fleet Standardization to introduce a common RS-68 engine across all Delta IV variants. These two efforts will increase booster assignment flexibility and reduce launch delays.

Ms. SANCHEZ. 68) As you know, Section 1248 of the FY2010 National Defense Authorization Act directed the Secretary of Defense and the Secretary of State to carry out an assessment of the national security risks of removing satellites and related components from the United States Munitions List. That report is now almost 2 years late. When will the Section 1248 report be delivered? What month can we expect delivery? What are the risks the U.S. space industrial base of not moving some of our Nation's commercial satellite products off of the U.S. munitions list? Is DOD conducting a review of these risks?

Mr. SCHULTE. 68) The Section 1248 report will be delivered to Congress on April 18, 2012. The report identifies some categories of satellites that can be moved from the U.S. Munitions List (USML) to the Commerce Control List (CCL) without undue risk to national security. Further, the report finds that U.S. national security interests would be best served by normalizing controls on satellites and related components, to enable the development of flexible and timely responses to rapid technological changes, consistent with existing authorities for all other strategic trade controls. These changes would facilitate cooperation with U.S. Allies and export control regime partners, strengthen the competitiveness of sectors key to U.S. national security, and increase U.S. exports, while maintaining robust controls where appropriate to enhance our national security. Ultimately, implementing the report's recommendations will help energize the industrial base, a key objective of the National Security Space Strategy, and build higher fences around fewer items, the goal of the Administration's Export Control Reform Initiative.

Ms. SANCHEZ. 69) What are the costs and benefits of entering into negotiations on the EU Code of Conduct? And what are the risks of not doing so? Will our military operations and needs be protected?

Mr. SCHULTE. 69) An International Code of Conduct could enhance U.S. national security by promoting responsible behavior in a domain that is increasingly congested, contested, and competitive. As more countries and companies field space capabilities, it is in our interest that they act responsibly and that the safety and sustainability of space are protected. A widely subscribed Code could encourage responsible space behavior and single out those who act otherwise, while reducing the risk of mishaps, misunderstandings, and misconduct. Debris mitigation standards, guide-

lines for reducing radiofrequency interference, and shared space situational awareness could help protect space and the advantages we derive from its use.

We are committed to ensuring that any Code would not limit, but rather strengthen, U.S. national security. The EU draft is not legally binding, recognizes the right of individual and collective self-defense, and is a good foundation for an International Code. A Code would focus on activities, rather than unverifiable capabilities. The U.S. Government has been closely consulted by the EU on its draft, and we will continue to shape an International Code through active participation in international discussions. DOD assessed the draft EU Code's operational impact and is developing steps to ensure that a final International Code fully supports U.S. national security interests. We are committed to keeping Congress informed as we progress through the long-term Code development process.

Ms. SANCHEZ. 70) What do you see as the major challenges ahead?

Mr. SCHULTE. 70) We are challenged by a space environment that is increasingly congested, with more than 22,000 trackable man-made objects in orbit; contested, by an ever-increasing number of man-made threats; and competitive, as the U.S. competitive advantage and technological lead in space erode. The National Security Space Strategy (NSSS) addresses these challenges, but must be implemented in the context of a fourth "c"—constrained. As we develop future architectures, the growing challenges associated with the budget deserve our attention as much as the growing challenges in space.

Ms. SANCHEZ. 71) As you know, Section 1248 of the FY2010 National Defense Authorization Act directed the Secretary of Defense and the Secretary of State to carry out an assessment of the national security risks of removing satellites and related components from the United States Munitions List. That report is now almost 2 years late.

A) When will the Section 1248 report be delivered? What month can we expect delivery?

B) What are the risks the U.S. space industrial base of not moving some of our Nation's commercial satellite products off of the U.S. munitions list?

C) Is DOD conducting a review of these risks?

Mr. KLINGER. 71) A) The Section 1248 Report was delivered to Congress on/about 19 April 2012.

B) We recognize that it is in our national security interest to maintain a robust space industrial base; our goal is to modify the controls placed on those satellites and related components that are widely available, while focusing stricter controls on those space technologies critical to our national security.

The rapid pace of technological development in the field of space exploitation poses unique challenges and risks to the space industrial base. Therefore, U.S. national security interests would be best served by normalizing controls to enable the development of flexible and timely responses to these technological changes, consistent with the President's existing authority for all other strategic trade controls.

C) DOD Analysis is based on the Export Control Reform USML rewrite process approved by the Deputies Committee.

- a) This systems engineering approach defines the most critical end items, components and technologies that provide the U.S. military its fighting edge (e.g., mission systems on airframes), and assesses risk.
- b) Comprehensive deliberations among operators and subject matter experts resulted in realistic determinations on what are important for military or intelligence operations and what should be controlled on the USML.
- c) Conversely, items that were designed for military end-use but are identical to those used in dual-use purposes, or do not provide unique military or intelligence capability, were deemed to no longer require control on the USML and were moved to Commerce controls.

Ms. SANCHEZ. 72) A piece of cloth that was left in the fuel line by the contractor during the manufacturing process led to a 14-month delay in AEHF reaching its intended orbit, which in turn cause delay to the next two AEHF satellite launches. While the total contract was worth nearly \$8 billion, the contractor's award fee was only reduced by \$19 million for this mistake. Prior to this problem, GAO reported that AEHF suffered a \$250 million cost overrun and 2-year delay in launch due to parts quality problems.

A) To what extent is DOD and the Air Force considering using more effective incentives to reduce parts quality problems, especially considering the challenges and delays associated with getting the first AEHF satellite to its intended orbit?

B) How does the Air Force quantify the cost of delays in procuring specific capability to the warfighter?

Mr. KLINGER. 72) A) The Air Force has taken strong steps to apply appropriate incentives to the AEHF contract, as well as with other contracts. The most important method is the contract type and incentive. Fixed price contracting reduces the government's financial liability, and the incentive structure motivates the desired performance. For AEHF-1, the program manager restructured the remaining fee on that effort, eliminating \$15 million and shifting incentives to motivate cost performance. Additionally, the contractor conducted a thorough investigation of the root cause and applied their best efforts to ensure no propulsion problems will reoccur on subsequent satellites.

B) With respect to warfighter delays, the Air Force coordinates very closely with the using Combatant Commands on the fielding schedules for all space and other weapons systems. This interaction is critical toward mitigating the impacts of any capability delays, which often cannot be quantified in terms of cost alone.

Ms. SANCHEZ. 73) In 2009, the GAO found that satellites, ground control systems, and user terminals in most of DOD's major space system acquisitions were not optimally aligned, leading to underutilized satellites and limited capability provided to the warfighter—in some cases for periods measured in years. Examples include: the MUOS satellite which relies on the troubled Joint Tactical Radio System (JTRS) program for the new MUOS waveform and radio terminals. The GPS satellites in orbit that contain the modernized military M-code signal designed for anti-jamming and anti-spoofing but which the warfighter will not be able to take advantage of until user terminals go into production. And the SBIRS-GEO satellite was launched with a staring and scanning sensor. While the GEO-1 satellite is currently on orbit with both sensors, the staring sensor will not be utilized for missile warning and missile defense for another six years due to a lag in ground capability.

- What improvements are being made to maximize use of the available capacity and reduce costs due to inefficiencies?

Mr. KLINGER. 73) When OSD(AT&L) recertified the SBIRS program in 2005 following a Nunn-McCurdy breach, the Air Force was directed to prioritize development of essential capability to perform the missile warning mission, supported by the GEO scanning sensor, over other mission areas.

SBIRS GEO-1 was launched in May 2011, and upon certification later this year, the SBIRS GEO-1 scanning sensor will provide missile warning performance that exceeds that of the legacy Defense Support Program (DSP). The SBIRS GEO-1 staring sensor is also undergoing initial sensor calibration. Today Overhead Persistent Infra-Red (OPIR) Research & Development (R&D) and Technical Intelligence (TI) users are receiving staring sensor data. Consistent with stakeholder direction and priorities, fully-calibrated staring sensor operations in support of Missile Warning (MW) and Missile Defense (MD) missions have been deferred until the final Increment 2 ground delivery in FY18. The remaining work to operationalize the staring sensor for the MW and MD missions is in ground system functionality which provides automated tasking and tuning to meet some of the most stressing ORD requirements.

While the SBIRS ground development is phased to optimally manage risks within budget constraints and established operational priorities, the program is continuing to examine options to accelerate increments of staring sensor calibration and mission processing to support Missile Warning and Missile Defense prior to FY18. Additionally, as part of the Air Force, National Geospatial-Intelligence Agency, and Missile Defense Agency Joint OPIR Ground architecture (JOG), the DOD funded initiatives to process SBIRS GEO starer data separately from the SBIRS program of record with deliveries planned in FY15/16.

Ms. SANCHEZ. 74) What do you see as the major challenges ahead?

Mr. KLINGER. 74) The environment in which we operate evolves and transforms: while space was not a benign environment during the Cold War, even that threat environment has been transformed. U.S. space capabilities are subject to a host of new threats including kinetic threats, non-kinetic threats such as jamming, and cyber threats originating from both state and non-state actors.

Our space acquisition system has historically focused on performance driven, edge-of-technology and engineering capacity; we consistently looked to push the edge of the "art and science" of the possible. We could afford this approach because the "addressable market" for most of these capabilities was relatively small as compared to the overall size of U.S. military forces and intelligence users, and these users were often more than not homogenous in their needs and demands. Acquisition of space capabilities frequently and consistently had a "first and often unfettered" call on the resources of the Defense Department and Intelligence Community as compared to many other capability areas.

- We simply no longer have this luxury; space capabilities are now integrated and inextricably bound up in the "nervous system" of U.S. military forces and intel-

ligence capabilities; users of U.S. national security space capabilities are both numerous and diverse in their requirements. Often, maintenance and continuity of service have become as or more important than pushing the envelope to achieve new performance capabilities. This reality is pressing us to improve the timelines of delivery of new capabilities. We also must focus on ensuring our space architectures are sufficiently robust and resilient to operate through natural and man-made threats.

- To ensure continuity of service is uninterrupted, we are recapitalizing virtually all of our space “lines of business” at precisely a time of sharply constrained resources. We are stressing affordability even in ongoing programs and stressing with our industrial partners to place as much emphasis on engineering for cost control and affordability as we have historically placed on engineering for performance.
- For industry, our challenge is to plan for more reliable and stable demand, more predictable opportunities for introducing new upgrades to technology, and more stability at the prime and second/third tier suppliers. Determining how much, what kind of capabilities can we afford to invest in to maintain a viable industrial and technology base, while maintaining continuity of service is a critical challenge.

Ms. SANCHEZ. 75) Can you outline, specifically, the work product that is included in so-called mission assurance costs? Are there efficiencies the Air Force can achieve in this area?

Mr. KLINGER. 75) Mission assurance activities consume approximately 5% of the EELV program budget. Products that result from this work include the following: hardware pedigree review reports; quality assurance inspection reports; booster-to-satellite integration inspection, testing, and progress reports; systems engineering oversight and reporting for launch vehicle structures, avionics, propulsion systems; launch site operations inspections and reports; final flightworthiness certification reports; and business/program management reports. Each launch is unique and only those activities that contribute to the reliability of each launch are funded. In addition, the Air Force reviews mission assurance activities annually to prune away any that do not materially contribute to reducing the risk associated with all launch missions.

Ms. SANCHEZ. 76) What do you see as the major challenges ahead?

Ms. SAPP. 76) There are multiple challenges ahead. Despite a constrained budget environment, system fragility and other external factors, the NRO must continue to provide the nation with critical overhead reconnaissance capabilities. To ensure uninterrupted support to operations over the long term, the NRO is implementing an organized, considered, and achievable plan to build a robust and adaptable architecture and culture. By working with mission partners, the NRO is laying the foundation for an optimized overhead intelligence collection, collaboration, and synthesis construct that will ensure decision advantage for the nation now and in the future.

Looking Forward: While the challenges the NRO faces are formidable, they are by no means insurmountable. Specific initiatives intended to implement the organizational, management, and business process changes necessary to address these issues include a decoupling of space and ground systems specifically intended to accelerate the delivery of new capabilities in response to rapidly changing, time-critical user needs. This decoupling will consolidate common functions and processes that will translate directly into enhanced technical and operational flexibility and reduced costs.

These changes will also help address the consequences of the acquisition reform era of the 1990s. One result of acquisition reform was the loss of a generation of project managers and systems engineers. While most of our engineering workforces are superbly qualified technically, many lack the extensive hands-on project management experience people previously had in these positions. This loss, coupled with the retirement surge in all government agencies, creates a particularly challenging workforce environment for the NRO. To address these challenges, we continually work to strengthen ties to parent organizations. This includes a focus on engineers, project managers, contracting officers, and program control officers to ensure the NRO workforce has the specific skills needed to effectively execute its mission.

Lastly, the NRO has returned to a more disciplined acquisition process that will reverse the negative effects of acquisition reform. This places renewed emphasis on systems engineering to capture and apply acquisition lessons learned. The NRO is collaborating with the Air Force and The National Aeronautics and Space Administration to promote strategies that will stabilize the space industrial base. We are collaborating with other space organizations on a strategy that ties the long-term

health of the space industrial base to the long term viability of our overhead architecture and its ability to support national needs.

The NRO has a history of resolving seemingly insurmountable technical problems to address the nation's highest priority intelligence needs. The changes being implemented today represent the organization's comprehensive approach to continuing its strong acquisition management performance, and approach to ensure the NRO continues its tradition of excellence.

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#### QUESTIONS SUBMITTED BY MR. FRANKS

Mr. FRANKS. 77) We are just beginning to experience a wave of powerful solar storms as the sun approaches solar maximum. Without advanced warning systems, geomagnetic flux has the potential to disrupt virtually every major public infrastructure system, including power grids, GPS, transportation, and telecommunications before we can take any effective protective action. Our Nation currently relies on a single, failing satellite to provide these warnings, the Advanced Composition Explorer (ACE), which is more than 10 years beyond its design life. To replace ACE, the National Oceanic and Atmospheric Administration (NOAA) in FY2012 is beginning work on refurbishing a decade-old spacecraft, DSCOVR, which the Air Force plans to launch. What are the Air Force's launch procurement plans for DSCOVR? When will the RFP be issued? What is the expected timing of the launch? Will this launch occur before ACE's expected demise and during the current solar maximum period?

Mr. KLINGER. 77) The USAF plans to execute DSCOVR launch services via the Orbital-Suborbital Program-3 (OSP-3) contract, managed by the Space and Missile Systems Center's (SMC) Space Development and Test Directorate (SMC/SD). The OSP-3 RFP is scheduled for release in April 2012, with contract award(s) planned for September 2012. The DSCOVR mission has been identified as a commercial new entrant launch opportunity and could support potential certification of new launch vehicle. DSCOVR is planned for a late FY2014 launch, but specific launch dates are dependent upon contractor proposals received in response to the OSP-3 RFP. It is unknown when the ACE spacecraft will become non-operational and current NASA estimates indicate solar maximum should occur in the spring of 2013. DSCOVR launch schedule is driven by the timelines required for satellite refurbishment, which will continue throughout FY2013, and launch-vehicle ordering and processing.

Mr. FRANKS. 78) DSCOVR has only a 2-year satellite design life. Yet, access to sustained operational space weather data is critical for defense and national security, as well as our Nation's economic infrastructure. What is the fallback plan in the event of either ACE's or DSCOVR's technical failure? Shouldn't we be planning for a DSCOVR follow-on satellite procurement now?

Mr. KLINGER. 78) The Department of Commerce (DOC) through the National Oceanic and Atmospheric Administration (NOAA) has plans to include a commercial partner in some of the activities for DSCOVR. NOAA is considering commercial data purchase of both solar wind and Coronal Mass Ejection (CME) imagery in the future. The DOD is a member of the National Space Weather Program which has endorsed DSCOVR as a near-term solution given ACE's age. The DOD currently uses the data from ACE to support customers and is supporting the DSCOVR launch in order to continue this valuable data being obtained from Lagrange 1.

Mr. FRANKS. 79) Last year, this committee, in its version of the FY2012 National Defense Authorization Act, stated of DSCOVR: "The committee is also aware of commercial data purchase solutions that could meet the Government's space weather data needs by fiscal year 2014 . . . . The committee encourages the Department of Defense to work with the NOAA to consider a competitively acquired commercial solution." Are you aware of any plans by the Air Force or NOAA to pursue a commercial solution as a follow-on to DSCOVR? What are your feelings about the commercial industry being able to fulfill this mission requirement?

Mr. KLINGER. 79) The Air Force is supporting the launch of DSCOVR. The DOD participates in the National Space Weather Program and shares the national view that space weather data from Lagrange 1 is important. The options for a follow-on to DSCOVR are many and varied. All feasible options will be considered in light of the current fiscally constrained environment that impacts both the Department of Commerce and DOD.

### QUESTIONS SUBMITTED BY MR. LANGEVIN

Mr. LANGEVIN. 80) General Shelton and Mr. Klinger, Operationally Responsive Space (ORS) had been a major priority for the Department since 2006. Can you explain why this program is being terminated? What plans if any does the Air Force have to sustain the ORS mission? And, on a point I believe is absolutely critical, how will this provide more responsive and timely space capabilities to the warfighter?

General SHELTON. 80) We plan to restructure the ORS program to incorporate the ORS tenants of responsiveness and resiliency across our space programs, to include programs such as the Advanced Extremely High Frequency Satellite, Space Based Infrared Systems, Global Positioning System III Operational Control Segment, Space Control Technology Insertion, and Technology Transfer programs. Beginning in 2013, we plan to meet warfighter needs for responsive space capabilities through programs of record and mechanisms such as the Joint Urgent Operational Needs process.

The Space and Missile Systems Center's Space Development and Test Directorate is sustaining the ORS-1 space vehicle and ground components through the life of the system with approximately \$7M/year of Overseas Contingency Operations funds.

Mr. LANGEVIN. 81) How will you support the ORS-1 satellite launched only 9 months ago with the termination of the Operationally Responsive Space Office?

General SHELTON. 81) Our Space and Missile Systems Center's Space Development and Test Directorate is the acquisition and sustainment manager for ORS-1. ORS-1 sustainment is funded through Overseas Contingency Operations funds, at approximately \$7M/year. The Directorate is prepared to support the space vehicle and ground components and deliver vital capabilities to the warfighter through the life of the system.

Mr. LANGEVIN. 82) General, as I mentioned last year, I remain concerned about the increasing challenges of U.S. access to space. What options are and should be considered to lower the cost of access to space?

General SHELTON. 82) To reduce the overall cost of access to space in the near-term, the Air Force is pursuing a strategy based upon procuring a planned number of cores and launches each fiscal year and the introduction of competition. Steady rate procurement allows the contractor to pursue economic order quantity buys, make investments to reduce overall cost and to take advantage of manufacturing learning curves. New entrant provisions to compete for Evolved Expendable Launch Vehicle class missions will reduce risk and provide the opportunity to decrease program costs.

Over the long-term, we will continue to explore ways to provide lower cost launch capability. We are looking outside the current paradigm to achieve dramatic savings. Along those lines, we are partnering with the Air Force Research Lab in the development of next generation technologies and a new domestically produced hydrocarbon main engine. We are also pursuing disaggregated architectures for our space systems as well as encouraging commercial providers to find new/innovative ways to access space.

Mr. LANGEVIN. 83) What is the Air Force doing to ensure newer entrants like SpaceX have access to the space launch business and the ability to compete for DOD space launch contracts?

General SHELTON. 83) The process is in place to provide new entrants the opportunity to compete for National Security Space launches. The Air Force, National Reconnaissance Office and National Aeronautics and Space Administration released the New Entrant Certification Strategy in October 2011. It defines the coordinated certification strategy for commercial new entrant launch vehicles and it is anchored on the existing National Aeronautics and Space Administration model. The United States Air Force Launch Services New Entrant Certification Guide also was released in October 2011. The guide provides the Air Force's risk-based approach to certify new entrant launch companies for Evolved Expendable Launch Vehicle missions, and it lists the criteria any new entrant must meet.

To facilitate the certification of potential new entrants, Air Force Space Command identified two missions on which new entrant launch providers may bid: the Space Test Program-2 and the Deep Space Climate Observatory. These Evolved Expendable Launch Vehicle-class missions will provide an opportunity for potential new entrants to gain experience in satellite launch to facilitate vehicle certification. Once a new entrant is certified, we will compete the launch services needs not covered under the FY13 Phase 1 Buy. When this phase expires and new entrants are certified, we intend to conduct future acquisitions in a full and open competition for launch services.

Mr. LANGEVIN. 84) General Shelton and Mr. Klinger, Operationally Responsive Space (ORS) had been a major priority for the Department since 2006. Can you explain why this program is being terminated? What plans if any does the Air Force have to sustain the ORS mission? And, on a point I believe is absolutely critical, how will this provide more responsive and timely space capabilities to the warfighter?

Mr. KLINGER. 84) With the successes of the Operationally Responsive Space (ORS) programs, the Department decided to incorporate the concept of operationally responsive space into the Air Force Space & Missile Systems Center (SMC) to increase resiliency, survivability and flexibility across all DOD space programs.

Transition efforts are underway to fully integrate responsive space principles into space architectures and Space Modernization Initiatives to:

- Develop enablers to ensure resilience, survivability and flexibility
- Explore space mission augmentation options
- Incorporate responsiveness into Research and Development (R&D) efforts across other platforms
- Integrate lessons learned from ORS accomplishments.

By integrating responsive space into the mission area platforms in both R&D and acquisition practice, the Department will continue to provide responsive and timely space capabilities to the warfighter.

Additionally, the Joint Staff has an extremely responsive and proven Joint Urgent Operational Needs (JUON) and newer Joint Emergent Operational Needs (JEON) process which will streamline JROC validation to expedite satisfaction of Combatant Commander urgent needs.

Mr. LANGEVIN. 85) How will you support the ORS-1 satellite launched only 9-months ago with the termination of the Operationally Responsive Space Office?

Mr. KLINGER. 85) ORS-1 operations and sustainment responsibilities including anomaly resolution, processing enhancements, configuration control, and ground segment updates, will be assumed by the Air Force Space & Missile Systems Center (SMC) through end of satellite life.

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#### QUESTIONS SUBMITTED BY MR. RUPPERSBERGER

Mr. RUPPERSBERGER. 86) Now that ORS-1 has been launched and declared operational, how would you characterize the performance of ORS-1 in fulfilling the Urgent Need it was originally intended to satisfy? Given the plans for ORS funding to be discontinued in the President's Budget Request, how will Urgent Needs be met in the future? What process will remain in place to address Urgent Needs?

General SHELTON. 86) The ORS-1 mission is successful in meeting the United States Central Command's (USCENTCOM) requirements which it was designed to satisfy. In a December 2011 memo, the USCENTCOM-Intelligence, Surveillance, Reconnaissance (ISR) Director stated, "CENTCOM is extremely satisfied with ORS-1. It has met or exceeded its projected capabilities and additional capabilities and applications continue to unfold. ORS-1 provides superb collection considering its design limitations and CENTCOM will continue to rely on its capabilities as an integral component to our ISR architecture and collection plan."

We plan to restructure the ORS program to incorporate the ORS tenants of responsiveness and resiliency across our space programs, to include programs such as the Advanced Extremely High Frequency Satellite, Space Based Infrared Systems, Global Positioning System III Operational Control Segment, Space Control Technology Insertion, and Technology Transfer programs. Beginning in 2013, we plan to meet warfighter needs for responsive space capabilities through programs of record and mechanisms such as the Joint Urgent Operational Needs process.

Mr. RUPPERSBERGER. 87) The Space Test Program has a distinguished 45-year history of fulfilling a requirement for low-cost access to space for developmental technologies and science experiments. Given the plans for dissolution of the Space Test Program as envisioned in the President's Budget Request, how will this ongoing requirement be met in the future?

General SHELTON. 87) The Space Test Program funding was eliminated due to higher Department of Defense priorities. The President's Budget includes significant investment in space research by the Air Force Research Laboratory, Defense Advanced Research Projects Agency and other Service laboratories.

Mr. RUPPERSBERGER. 88) As you know, the report directed by Section 1248 of the FY10 Defense Authorization was due to the defense congressional committees in April 2010—almost 2 years ago. While the Congress received an interim report on this topic last summer, it has yet to receive the final report. In the meantime, the



U.S. satellite industrial base continues to struggle to keep pace with its global competitors in what is an intensely competitive international marketplace. In fact, a November 2011 study on the health of the space industrial base, entitled “U.S. Industrial Base Analysis for Space Systems,” conducted by The Tauri Group under contract to OSD AT&L Industrial Policy, cites 11 space technologies of “high risk” due to the absence of U.S. suppliers or a single U.S. supplier, and 17 areas “at risk” due to limited suppliers, suppliers with a potential to create bottlenecks, those with workforce issues, and anticipated cost increases. As our Nation moves into an era of austere Government budgets, it would appear that sustaining our defense industrial base through a period of shrinking budgets and programs is going to be of even greater importance. Rather than sustaining portions of this industrial base via the expenditure of funds, the satellite sector appears to be one area where regulatory change could have a significant impact on the health and sustainability production lines of crucial importance to the most exquisite of our national defense systems. When will the Section 1248 report be delivered? And, do you agree that moving some of our Nation’s commercial satellite products off of the U.S. munitions list could have a significant positive impact on the U.S. space industrial base? Do you believe that changing the current statute is in fact a national security imperative in order to sustain this industrial base?

Mr. SCHULTE. 88) The Section 1248 report will be delivered to Congress on April 18, 2012. The report identifies some categories of satellites that can be moved from the U.S. Munitions List (USML) to the Commerce Control List (CCL) without undue risk to national security. Further, the report finds that U.S. national security interests would be best served by normalizing controls on satellites and related components, to enable the development of flexible and timely responses to rapid technological changes, consistent with existing authorities for all other strategic trade controls. These changes would facilitate cooperation with U.S. Allies and export control regime partners, strengthen the competitiveness of sectors key to U.S. national security, and increase U.S. exports, while maintaining robust controls where appropriate to enhance our national security. Ultimately, implementing the report’s recommendations will help energize the industrial base, a key objective of the National Security Space Strategy, and build higher fences around fewer items, the goal of the Administration’s Export Control Reform Initiative.

Mr. RUPPERSBERGER. 89) Recognizing the severe constraints of the current fiscal environment, and given that some programs must be cut or limited so that others can be funded, it appears that numerous small, low-cost, innovative programs have been cut to preserve funding for a few big-ticket programs with a history of cost overruns. Doesn’t this reward and perpetuate the wrong type of behavior and eliminate the possibility of creating new models of program development and execution?

Mr. KLINGER. 89) With the challenge to balance \$450B in budget cuts across the years, all programs, big and small, were individually and collectively assessed. No, DOD program escaped thorough examination. Funding was cut from some small and large programs where the Department determined adequate risk could be assumed. This year, the Department’s space initiatives and efficiencies include increasing, restructuring, and where necessary terminating or delaying programs to better deliver critical space capabilities. The Department’s budget proposal continues to pursue satellite block buys with incremental funding to avoid costly production breaks, preserve the most critical industrial base capabilities, and reduce non-recurring engineering costs for the procurement of the Advanced Extremely High Frequency (AEHF) and Space Based Infrared System (SBIRS) replenishment.

The Department’s Better Buying Power (BBP) initiative establishes and requires major programs to be executed within “Should-Cost” estimates with accountability and consequences. Additionally, BBP includes contracting initiatives increasing block buys or increasing competition, where prudent, to find efficiencies and savings. These BBP initiatives have been applied to large critical space programs such as AEHF satellites system, SBIRS satellites, Evolved Expendable Launch Vehicle, and the much used Global Positioning System in the FY13 budget build. Initiatives are already underway to continue to “reap” savings from BPP in large space programs as FY14 budget process begins.