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# HEARING

ON

# NATIONAL DEFENSE AUTHORIZATION ACT FOR FISCAL YEAR 2008

AND

# OVERSIGHT OF PREVIOUSLY AUTHORIZED PROGRAMS

BEFORE THE

## COMMITTEE ON ARMED SERVICES
## HOUSE OF REPRESENTATIVES

ONE HUNDRED TENTH CONGRESS

FIRST SESSION

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STRATEGIC FORCES SUBCOMMITTEE HEARING

ON

# BUDGET REQUEST FOR MILITARY SPACE ACTIVITIES

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HEARING HELD
MARCH 23, 2007

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# FISCAL YEAR 2008 NATIONAL DEFENSE AUTHORIZATION ACT—BUDGET REQUEST FOR MILITARY SPACE ACTIVITIES

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HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
STRATEGIC FORCES SUBCOMMITTEE,
*Washington, DC, Friday, March 23, 2007.*

The subcommittee met, pursuant to call, at 9:00 a.m., in room 2212, Rayburn House Office Building, Hon. Ellen Tauscher (chairman of the subcommittee) presiding.

## OPENING STATEMENT OF HON. ELLEN O. TAUSCHER, A REPRESENTATIVE FROM CALIFORNIA, CHAIRMAN, STRATEGIC FORCES SUBCOMMITTEE

Ms. TAUSCHER. The hearing will come to order.

The Strategic Forces Subcommittee meets today to receive testimony on national security space activities from the Under Secretary of the Air Force, Dr. Ronald Sega; the Director of the National Reconnaissance Office (NRO), Dr. Donald Kerr; and the Commander of Air Force Space Command, General Kevin P. Chilton.

I want to thank each of our distinguished witnesses for being here today.

This hearing is a very important opportunity for the subcommittee to consider the posture of our Nation's space assets and to reflect on a recent event that has exposed the fragility of these systems. I am speaking of China's test of a direct-ascent, kinetic kill anti-satellite weapon (ASAT) on January 11, 2007.

The Chinese aimed this weapon at one of their own aging weather satellites and destroyed the target—creating a debris field of thousands of lethal objects. This debris will remain in low-earth orbit (LEO) and threaten satellites, the Space Shuttle, and the International Space Station, for several decades.

The question now is: How should we respond?

The United States has been at this crossroads before. In the late 1980's, the former Soviet Union and the United States unofficially agreed to halt the development of weapons that target space assets. This understanding arose, in large measure, from concerns about the persistent debris fields created by a U.S. direct-ascent ASAT test.

I am mindful of the head of United States Strategic Command (USSTRATCOM), General Cartwright's comments before the full committee Wednesday, that not every problem in space requires a solution in space, as well as his concern about a possible arms race

in space. And I would appreciate your comments about his concerns.

However, today I would like to focus more narrowly on the status of our current space assets. I want to make sure that my subcommittee, as well as the Department of Defense (DOD), are doing everything we need to ensure that our warfighters retain the advantage of space-based systems, and that this advantage is not degraded by the Chinese test or other future attacks.

Future attacks might not come just from the likes of a kinetic kill ASAT, but also from ground-based lasers and electronic jammers. It is also possible that an enemy might directly attack the ground-based components or communications links used by satellites. Our satellite capabilities may be vulnerable to attacks through cyberspace, as well.

One of the most basic requirements for protecting our satellites, which I am concerned has not been emphasized sufficiently, is to know their current status and to understand the threats they face.

Today, I would ask the witnesses to address what we can do to improve security as well as the situational awareness of our assets on-orbit.

With an aging legacy generation of systems on-orbit, the national security space community has been struggling to develop and field a new generation of systems for the past decade.

Many of these systems have been plagued by inaccurate cost estimates and optimistic predictions of technical maturity. Some of the programs have been required to be recertified as "critical to national security" after reaching Nunn-McCurdy statutory limits on cost overruns.

Two programs that breached this statutory cap recently were Space Based Infrared System (SBIRS)-High and National Polar Orbiting Operational Environmental Satellite System (NPOESS).

I would like to know if our witnesses are concerned that other programs in the space portfolio might breach this statutory cap this year.

More generally, I am concerned that the space acquisition system is broken, and I would ask our witnesses to discuss steps that we can take to fix the process.

I am very well aware of the benefits space-based assets provide to the warfighter, and I am committed to maintaining these capabilities without any gaps. Yet over the past few years, Congress slowed the development of selected systems through the budget process.

This has been due to concerns about the pace of these new programs and an emphasis on "transformational systems" designed to skip a technological generation.

I would like to ask our witnesses today to address the relative merit of proceeding with some of these new systems at a time when we are becoming more aware of our shortfalls in the areas of Space Situational Awareness (SSA) and the protection of our current assets.

While we have many questions, I want to assure you that the Congress is committed to working with the Department and the intelligence community (IC) to put our national security space programs on an affordable, sustainable track—one which accounts for

the change in the threat environment and will protect our warfighters and the American people.

Before we proceed, I would like to remind my colleagues and the witnesses that we are in open session and to take care to keep our questions and answers unclassified.

With that, I would like to thank the witnesses again for being here today, and I look forward to your testimony.

As I told our witnesses, we are expecting some votes on the floor and perhaps as soon as the next half-an-hour, and then perhaps some votes later in the morning. And we would just suspend our testimony and questioning until we can come back and finish it.

Now, I would like to recognize my very good friend and my colleague, the distinguished Ranking Member, Mr. Everett, and offer him the time that he chooses for any comments he would like to have.

Mr. Everett, the floor is yours.

**STATEMENT OF HON. TERRY EVERETT, A REPRESENTATIVE FROM ALABAMA, RANKING MEMBER, STRATEGIC FORCES SUBCOMMITTEE**

Mr. EVERETT. Thank you very much, Madam Chairman. Thank you for your leadership in calling this meeting. It is extremely important. And I join you in welcoming our guests.

We thank you for your service and your leadership in the space community.

Space is complex and requires our Nation's best and brightest. Please relay our gratitude to the men and women in your respective organizations for their dedication and hard work and the sacrifices that they make.

I have had a chance to talk with General Chilton about the reliance our troops have on space. He made the comment that once you have it, you expect it. I think he is right on the mark.

And I believe that, as the threat grows, our military capabilities advance on land and sea and air, cyberspace, and we must keep—and in space itself—and we must keep pace. Space capabilities are essential for nearly every military operation our forces undertake.

They also heavily contribute to our economy. In 2006, space capabilities contributed roughly $97 billion to the global economy. And the annual growth is about seven percent a year. The Global Positioning System (GPS) industry alone contributed roughly $30 billion.

This is why the sustainment and modernization of our space capabilities and the infrastructure is so important. With much of the baby boomer aerospace workforce beginning to retire, we must also ensure that their expertise is passed on to younger generations.

I am deeply troubled by the Chinese ASAT satellite test that occurred in January. While we have discussed these threats in great depth in classified briefings, I have a few comments to make here.

The test clearly sent a message that China has the ability to hold our military and commercial satellites at risk. But it is not the only threat to space.

As I have discussed in previous sessions, we must also pay attention to other threats, such as STRATCOM and GPS-jamming la-

sers, orbital debris, space weather, and the threats to our ground stations.

We must place emphasis on increasing our Space Situational Awareness—something we have talked about often—and developing a comprehensive strategy for the protection of our space assets. I also believe we must think strategically about the long-term implication these threats have on our Nation's space architecture.

I look forward to hearing our witnesses' thoughts on this.

The fiscal year 2008 budget request reflects a great deal of thought and hard work, and we recognize the fiscal responsibilities under which this budget was crafted. However, we have a responsibility to address some of the important issues that I would ask our witnesses to discuss on the stand today.

Second, I would like to highlight a few areas that I am specifically interested in hearing about today.

Progress in space acquisition. We seem to repeat the same concerns about cost growth and program delays year after year. A Governmental Accountability Office (GAO) study, commissioned last year by this subcommittee, found that cost growth is due to the tendency to start programs before knowing whether requirements can be achieved within the available resources.

Have we turned the corner on such programs as SBIRS-High, Advanced Extremely High Frequency (AEHF)—and Evolved Expendable Launch Vehicle (EELV)?

The newer programs, such as Transformational Communications Satellite (TSAT), GPS–3 and Space Radar—what confidence do you have that the acquisition strategies are executable, the technology can be matured and the resource requirements are adequately understood?

Finally, the implementation status of the operational responses phase, the Operationally Responsive Space (ORS) program office, which Mr. Secretary, as you know, myself and Mr. Reyes saw the 14th Air Force stand up out there last year. And ORS was a key legislative provision for this subcommittee in last year's bill.

Dr. Kerr, I am specifically interested in hearing about the following: NRO's efforts to improve its space acquisition—the concerns I outlined for Dr. Sega are equally applicable to your organization; your thoughts on how NRO is providing support to the warfighting community and areas where you believe this can be improved.

And General Chilton, I would like to hear your thoughts on progress in our Nation's space cadre and your efforts to recruit, train and manage to the career path of our talented space professionals; the space capability needs and priorities of the combatant commander and our forces in the field; your thoughts on the operational integration of space.

Finding new and better ways to leverage our space assets is critical to today's battle. Initiatives such as ORS give us hope that we can find innovative ways to acquire and afford new space systems at a much lower cost.

Also, how space intelligence and SSA can be better integrated with space satellite operations, providing near real-time support to military users.

Finally, gentlemen, I would like to hear from each of you on efforts to enhance black and white space integration. Also, please dis-

cuss what contributions you and your organizations have made to improving interagency collaboration across national security space.

Again, thank you for being here with us today. Your work is critically important to our Nation. And I again thank our chairman for calling this important hearing.

Thank you.

Ms. TAUSCHER. I thank the ranking member.

He has brought a lot of expertise and time to this effort, and I thank him for the questions that he has embedded in his statement.

Dr. Sega, Dr. Kerr, General Chilton, first let me thank you and your staff for the comprehensive statements that you not only submitted on time, but really provided us with a chance to get, I think, at the learning curve that we intended to.

Your statements will be submitted to the record. If you could summarize as best you can in five minutes or so what the salient points of these statements are and perhaps begin to answer some of the questions that the ranking member and I have put forward in our statements, that would be great. And then, when members arrive, we will begin our questioning and answering.

So, I will start with Dr. Sega. Thank you.

## STATEMENT OF DR. RONALD M. SEGA, UNDER SECRETARY OF THE AIR FORCE

Dr. SEGA. And thank you.

Madam Chair, Congressman Everett and distinguished members of the committee, it is an honor to appear before you today as the Under Secretary of the Air Force and Department of Defense Executive Agent for Space to discuss a topic that is vital to our Nation and national security space.

I thank you for submitting the statement for the record.

Ms. TAUSCHER. You are welcome.

Dr. SEGA. Over the last year we continued to focus on three areas that I discussed with the committee last year: integration across national security space, as well as with air, land, sea, and cyberspace; getting back to basics in our acquisition of space programs; and the importance of ensuring the vitality and proficiency of our space professionals and our science and engineering workforce.

I am pleased to report that we have made progress in all these areas and are starting to see the benefits of this approach. In fact, at this time, there is no Nunn-McCurdy breach in our space systems, nor do we foresee a Nunn-McCurdy breach this year in our space programs.

I would like to highlight that we are working very hard to ensure continuity of service and some key capabilities. These include: missile warning; strategic communications; and position, navigation and timing.

The global rate of change of technology in the 21st century and the number of nations directly engaged in space continues to increase. The capacity to contest space operations and capability is also growing, as evidenced by the recent use of a kinetic ASAT weapon.

As a result, we can no longer consider space to be a safe haven or sanctuary, and Space Situational Awareness, as was pointed out, has become increasingly important.

To enable us to better understand the activity in space is the key element of us supporting and protecting our space capabilities.

ORS also has become more critically important to us. It provides an opportunity for us to gain the ability to reconstitute quickly or augment existing satellite constellations.

We have had several achievements across the DOD space portfolio in the last year. On March 8, 2007, we accomplished our 50th consecutive successful operational launch of national security space satellites. It is a national record. It far exceeds our previous record of 42 set in the years 1968 to 1971.

We have made significant progress in Space-Based Infrared, the SBIRS program. The first Highly Elliptical Orbit—HEO–1—SBIRS payload was successfully launched last year and has met or exceeded all on-orbit performance expectations.

Several key tests were also conducted in the first SBIRS geosynchronous earth orbit (GEO) satellite payload and spacecraft—in preparation for launch in 2008.

Continue to emphasize the integration collaboration, not only across the national space community, but also across functional areas, such as intelligence, surveillance and reconnaissance (ISR), and among DOD entities and other Government agencies, industry, academia, and Congress.

Our goal is to create partnerships. We believe they are essential to delivering requirements on cost and on schedule and ensuring appropriate funding stability for these programs.

We have continued to refine and implement the back-to-basics initiative, as we discussed last year; promoting renewed emphasis on increasing discipline in the development and stabilization requirements and resources; improving systems engineering practices and management; improving standards and increasing the in-plant presence of our workforce; and implementing a more deliberate acquisition planning strategy.

We have also established a goal of funding to a cost estimated 80 percent confidence, to help ensure space program success.

The back-to-basics approach is focused on mission success and our space acquisition programs and is divided into four charts. I refer to the chart here.

The foundational piece is science and technology. And the next development in technology is technology development, systems development and then system production.

It is in the systems production where we are reducing risk, so that we bring technologies on more mature. The acquisition cycle time should be reduced, and we believe cost and schedule risk is reduced.

The next generation is systems development, which is key and very, very important to prepare for the next generation of a capability and the next generation's development in science and technology.

Let me give you one example of how this is working on a major acquisition program. One is GPS–3A.

Through our requirements process, the Joint Requirements Oversight Council (JROC) has validated the block approach to the GPS–3A satellite. It is important that we go beyond 2F to add another frequency, L1C, compatible with Galileo, and additional power for anti-jam in the M-Code, approximately a factor of 10 in power, and a growth path forward for 3B and 3C.

Three-B will have crosslinks and additional capabilities. We will work on them in parallel with developing the 3A satellite. When that has matured, we will insert them and develop the 3B satellite constellation.

In parallel with that, another generation, the spot beam is necessary for us doing the technology development work, which will then mature to systems development and become the additional capability in GPS block 3C.

Meanwhile, the fundamentals of clocks, for example, needs to be part of our science and technology program. So it is an investment portfolio to assure us that we have position, navigation and timing capability for our country going forward. So, this is what you see in the budget today.

In July, Congressmen Everett and Reyes witnessed the standup of the space development and test wing. That is in our product center, Space & Missiles System Center (SMC). And they do the systems development and the system production.

There, across the street from the Air Force research laboratory that does science and technology and technology development, so we can accelerate from an idea to a fielded system. And that is kind of a core for our ORS work in Albuquerque.

Our example of that was the TacSat–2 satellite. Went out to see that activity on Wallops Island a few days before it actually launched. We made a decision to buy a Minotaur booster for that satellite just seven months prior to it actually launching.

The team was from the Air Force, Army, Navy and National Air & Space Administration (NASA). And it is on-orbit and doing well.

So, that is our first in a series of TacSat satellites. Part of ORS and our ORS budget, as you see, has gone up significantly from our 2007 request to 2008.

The next capability I would like to talk very briefly about is that of missile warning, missile defense, technical intelligence and battle space characterization—SBIRS.

Now, as we work on SBIRS—think of that in this block one approach—what follows SBIRS? That is the AIRSS program—Alternative Infrared Satellite System program—where we have let contracts for the technology development work in terms of the focal point arrays and electronics that are fundamental to that satellite, as well as some system definition work that is here.

In an investment portfolio strategy, we not only are looking at today's but tomorrow's solutions, to continue the capability on-orbit.

So, that is the approach that we have used—back-to-basics block approach.

Ms. TAUSCHER. Dr. Sega, we have to go vote. And coming back and forth, I think we will probably restart around 9:40. If we can get back before that, we will. But we have to go vote, and we will

get a sense for whether we will have any future votes in the next hour or so.

So, we will be back as fast as we can. Thank you.

[Recess.]

Ms. TAUSCHER. Thank you so much. I am sorry that we had to interrupt the proceedings for votes, but that is the other part of our job that we have to do.

Dr. Sega, you wanted to continue, please?

Dr. SEGA. Thank you.

And I will just make one last point. That is with respect to workforce.

I think it is the finest in the world. We do have some more experienced personnel, who will soon be eligible to retire. So we are working hard to attract and retain the technically skilled people to ensure we have the appropriate technical foundation and essential skill sets available to accomplish our space missions.

The National Defense Education program continues to provide the opportunities for scholarships for math, science, engineering and foreign language, with a focus on critical skills and critical people.

That was requested and funded at $10 million in 2006, $20 million in 2007, and we are requesting $44 million. It is a small but important part of our efforts.

You will hear more of the National Space Security Institute led by General Chilton. That is serving us well, also.

So, in conclusion, our Nation continues to depend on its space capabilities. It is an integral part of military power, industrial capability and economic vitality.

We must continue to ensure the continuity of services in critical areas such as missile warning, strategic communications and position, navigation and timing.

We continue to focus on integration, America's space efforts, back-to-basics approach to space acquisition, and a continuing emphasis on strengthening America's professionals—space professionals—and our science and engineering workforce.

So, initial application of our strategy over the past year has shown promising results, as we continue toward securing our Nation's space capabilities for the future.

I look forward to continuing working with the committee, and thank you for your continued support of national security space.

[The prepared statement of Dr. Sega can be found in the Appendix on page 37.]

Ms. TAUSCHER. You are welcome, Dr. Sega.

Dr. Kerr, please. Once again, your testimony has been put into the record. If you could summarize, we would appreciate it. Thank you.

## STATEMENT OF DR. DONALD M. KERR, DIRECTOR, NATIONAL RECONNAISSANCE OFFICE

Dr. KERR. Madam Chair and Mr. Everett, thank you for this opportunity to appear before you again this year.

As you know, the NRO is a joint Department of Defense and intelligence community organization. And we are involved in the re-

search, development, acquisition, launch and operation of overhead reconnaissance systems.

They are integral to military operations. We support battle space preparation, precision targeting, wide area surveillance, blue force tracking and battle damage assessment, as well as providing near real-time support to ongoing tactical operations.

And the definition for near real-time is seconds to minutes, unlike past history where it might be months.

Simply put, the NRO systems provide the United States with a distinct asymmetric advantage in a world that is in fact defined by rapidly changing targets and threats.

The NRO's performance since 9/11 has demonstrated that overhead systems—designed, in some cases, for a very different era and against a different problem set—can be adapted to collect against small fleeting targets with dramatic success.

Since the NRO's inception in 1961, our mission has been to build and fly the most technical, most versatile and most enduring reconnaissance spacecraft in the world.

These systems are required to provide national intelligence 24 hours a day, 7 days a week and, of course, 365 days a year. And they, of course, must adapt every day to the challenges before us.

We initially developed these systems during the height of the Cold War, in the analog era. And yet, they continue today in the digital age against targets that did not exist when the Soviet Union was America's principal strategic threat.

One of these systems last year celebrated its 25th anniversary. It has been to a few wars, built with specifications for the Cold War, supported the conflict in the Falklands, Gulf I, the invasion of Afghanistan and the continuing Pak-Afghan border area work and, of course, now Iraq.

It is remarkable that the developers did their job as well as they did. It is even more remarkable that those on the ground dealt with the effects of aging, so that that spacecraft still contributes to our national security today.

So, 25 years and counting is something we are very proud of.

A few other brief examples of what we bring in terms of operationally responsive capabilities. Our entire overhead constellation supports combat search and rescue when it is needed. And that is truly a real-time capability, one that has led to the rescue of many downed airmen over recent years.

It also helped us to identify technical solutions to counter the use of improved explosive devices (IEDs)—another trying area for the United States.

And closer to the user, we have developed Web-based tools now transferred to the National Geospatial-Intelligence Agency that allows people worldwide to access libraries, as well as current data in support of their tactical operations.

It is important to make note of the fact that we are not a self-tasking organization. That would be dangerous. We work with our mission partners. The functional manager for signals intelligence (SIGINT) is my colleague, the director of the National Security Agency (NSA). In parallel for imagery, it is Admiral Murrett at NGA.

And so, other than things like blue force tracking, where we go direct to the user, it is always as part of the larger national capability.

One of the important factors, as well, because we operate in space we can provide global situational awareness to the national leadership, even when other intelligence capabilities have been focused on particular regional conflicts. And so, that is an important and continuing part of what we do.

We, too, are focused on acquisition excellence, and I will mention a few of the things that at least give us a sense that we are making progress in that area.

With regard to becoming operationally responsive in space, we are doing that principally on the ground. This is where we can best respond, because we can do it in a period of weeks and not longer. And there are remarkable steps that have been made to make the SIGINT system, as well as imagery, more responsive through better processing and delivery on the ground to the users.

I have also consolidated our ground system development efforts into a single integrated program that links to a commitment to have an integrated ground architecture shared by NGA, NSA, DIA, as well as the NRO.

And we are well along in setting that architecture in place. Pieces of it already exist in Iraq in support of the conflict there.

This year's budget also includes the first jointly funded approach to Space Radar. It is a pleasure to be able to report that the intelligence community and the Department of Defense, I think have reached a way forward, where both will be contributing to the development of this very important program.

The funds have been transferred to the NRO military intelligence program, and more importantly, the merging funds.

There is a single program manager. And so, while he is drawing on resources from both the intelligence community and the Department of Defense, there is no confusion about who has the responsibility for that program; it is Major General Tom Sheridan.

Last August, you are aware that the President signed the new National Space Policy. The NRO was a member of the interagency team that developed the policy, and we are working with the other team members, including Dr. Sega and General Chilton at the table, to move that forward, as well.

With regard to what we are doing in, call it the infrastructure for our space program, the Air Force and the NRO are working together to improve the career development of our space professionals.

With Space Command, we have created an Air Force-NRO space assignment advisory board to track the careers of space professionals to ensure that they are provided the job experiences, as well as the education and training, necessary for their professional advancement.

We have also teamed with Space Command in training space professionals across the Government at the Non-proliferation and National Security Institute (NNSI), which I am sure General Chilton will speak more about.

Finally, locally, we have teamed with and contracted with two local universities to offer additional educational opportunities to

both military and civilian employees of the NRO—not just at the certificate level, but at the master's level—in engineering, administration or public management, to make it portable, something they can take with them in their careers.

Improving our acquisition processes has been the focus for me since I took over the NRO in July of 2005. We have abandoned "acquisition reform," as it once was known, and we are making progress that is measurable.

Two quick points in that regard.

As part of the President's management agenda and the Government Performance and Results Act, OMB evaluates at least one of our major programs every year. In the last evaluation, our communications directorate received a grade of 81, the highest of all of the intelligence community agencies, and compared very well with the best across the Government.

Second, our mission integration and development program—the MIND—was recognized last October by the Department of Defense and the National Defense Industrial Association, as one of the Department's top five programs.

The National Space Policy also includes interagency partnerships as a key feature. This is a natural for the NRO, since we are already a joint venture.

Besides the routine interactions with our mission partners, we also have more formal venues, like the Space Partnership Council, which includes Air Force Space Command, U.S. Strategic Command, the defense executive agent for space sitting next to me, Director of Defense Research & Engineering (DDR&E) and DARPA.

This council addresses broad issues across the infrastructure that supports us all. And so, concerns about EELV, communications and the like, are what comes to the table, and we do actually occasionally take action, which is the best part of it.

I also have a deputy director for mission support. It is his job, in fact, to deal with warfighter needs. He is responsible for the 47 representatives that we have in the various commands and theaters, and it is to help users best employ the capabilities that we are responsible for.

In addition, he is the deputy commander of the Joint Functional Component for Space under U.S. Strategic Command.

Interestingly enough, General Shelton, who is also 14th Air Force, is the commander. General Horne, U.S. Army, is the first Army flag officer to serve at the NRO, and will be the deputy for that position.

Science and technology, of course, is key to our future, as it is the broader Department of Defense. The NRO has had an advanced science and technology directorate for many, many years. That is where we invest in the enabling technologies that sustain our ability to deliver the capabilities that we have.

One final message that you might particularly appreciate is the importance we put on sound financial management. Since fiscal year 2000, we have undergone annual financial audits by independent public auditors.

In fiscal year 2003, we received a clean audit opinion—the first in the intelligence community.

Now for the bad news. We have not been able to repeat it, and for a very interesting reason. We cannot demonstrate a valuation and depreciation model for on-orbit systems to the satisfaction of the auditors. [Laughter.]

Ms. TAUSCHER. Do they want to do due diligence? [Laughter.]

Dr. KERR. That is right. We will be glad to send them, if we can afford it. But we——

[Laughter.]

Ms. TAUSCHER. That may be a good idea.

Dr. KERR. We are working with the Financial Accountability Standards Board (FASB).

Ms. TAUSCHER. Right, FASB.

Dr. KERR. And we are—the FASB—and doing so with NASA and others in the intelligence community, because there are a number of systems the U.S. Government buys and puts in places where they cannot be recovered. And so, we need it acknowledged in an appropriate way to deal with that problem.

So, we are focused on proper funds management. We have had no criticism for that, only how we depreciate satellites. And so, we are still the only member of the intelligence community that has ever gotten an unqualified opinion.

So, Madam Chair, we appreciate this opportunity to be with you and answer your questions. Thank you very much.

[The prepared statement of Dr. Kerr can be found in the Appendix on page 54.]

Ms. TAUSCHER. Thank you very much, Dr. Kerr. I very much appreciate your comments about putting some auditors—and perhaps we will send them with a lawyer or two into orbit. [Laughter.]

General Chilton, I was thrilled to come to your command last month. Let me thank you and the airmen and all the joint military staff that you have there. It was a phenomenally impressive opportunity for me to be there and to meet with you and see your facilities and to get a briefing there.

So, we would love to hear your testimony. And obviously, your testimony has been submitted to the record. And if you can give us a brief synopsis of it, we would appreciate it.

## STATEMENT OF GENERAL KEVIN P. CHILTON, COMMANDER, AIR FORCE SPACE COMMAND

General CHILTON. Happy to. Thank you, Madam Chair, for your kind words. And, of course, you and all the members of the committee are always welcome to come visit at Air Force Space Command. We are proud of what we do out there, particularly of our men and women who serve out there.

Ms. TAUSCHER. Thank you.

General CHILTON. Madam Chair, Representative Everett and distinguished members of the committee, it is truly a privilege for me to be with you all today.

And I am also proud to join the table here with my good friends, Dr. Kerr and Dr. Sega, two great leaders on our national security space team.

I am also proud to have with us today a member of Air Force Space Command. Colonel Jay Raymond is one of our space leaders, and he is seated right here.

Jay, thank you.

He is a commander out at Vandenberg Air Force Base, of the group out there.

But what I wanted to highlight is that Jay has recently returned from a deployment to Operation Iraqi Freedom (OIF), where he served as the Director of Space Forces in the Combined Air Operations Center under the command of Lieutenant General Gary North. And this is where the rubber meets the road on air and space integration.

And Jay was in charge and leading over 100 joint folks, bringing space effect to our warriors all over the Central Command (CENTCOM) area of operations (AO).

And the true power that this integration brings is that, not only was he there bringing his expertise and the team of the joint fight there, he had the ability to reach back to 14th Air Force at Vandenberg Air Force Base California, where General Willie Shelton leads, as Dr. Kerr said, not only 14th Air Force, but the Joint Functional Component Command for Space that works directly for STRATCOM.

And through that relationship, we bring space from the joint space capabilities directly into the air operations center and to the Joint Forces commander over there, now Admiral Fallon.

It is a powerful linkage. Jay did a super job over there, and he learned a lot about air and space integration and he has brought that back.

Currently over there, we have a colonel who had served for Dr. Kerr in a leadership role in the NRO—an airman who knows the NRO business very well, and he is over there now, bringing that integrated force forward.

So, we are working and teaming together to make sure that we leverage all of our space capabilities and our support to the combatant commanders. And we do not just do it in CENTCOM. We do it for every regional combatant commander around the world.

Today, I am proud to represent that team of airmen in Air Force Space Command that provide these capabilities day in and day out, to not only STRATCOM, but every combatant commander. Over 40,000 people—active duty, Guard, Reserve, civil servants and a tremendous contractor team that is in the fight with us, 7 days a week, 365 days a year.

And what are they bringing? They are bringing missile warning with our Digital Signal Processing (DSP) constellation. They are enabling missile defense by providing the first reaction and the first response for a launch against this country, not only with our space-based system, but with our radar systems.

They are providing space surveillance with our electrical-optical systems scattered around the world, as well as our radars and our one space-based satellite.

They are providing critical position, navigation and timing—one of the things that Representative Everett said we have come to take for granted, not only in our society, but the way we fight—that is absolutely essential to the way we fight today.

They are providing environmental monitoring to the Defense Meteorological Satellite Program. And as General Moseley says, men and women of Air Force Space Command are the backstop for our

Nation's ultimate defense, as they stand strong every day with our intercontinental ballistic missile (ICBM) force in the northern tier states—always ready, always prepared.

In the satellite communications area, our Defense Satellite Communications System (DSCS) constellations, our MILSTAR constellation, our global broadcast satellite system—all have airmen from Air Force Space Command's fingers on them. They are making sure that they deliver the capabilities that are required around the world today.

And none of this happens without the professionals that we have in both the Patrick Air Force Base in Florida and Vandenberg Air Force Base in California, that take care of our gateways to space for America and launch those satellite systems into orbit.

It is a team squarely focused on enabling the joint fight every day. To win the war today and, just as importantly, though, to prepare for future conflicts and make sure we stay strong and out in front as a nation.

And you will see this reflected in the investments in this budget this year in just about every area that I have chronicled.

In missile warning we are moving forward with the SBIRS constellation. In space surveillance, space-based space surveillance satellite program, as well as a new investment program in integrated Space Situational Awareness, which is very important.

Position, navigation and timing, we are advancing the ball with GPS 2RM launches, 2F is coming on board, and we are laying the groundwork for GPS 3, that will provide critical capability to our warriors in the future.

Strategic deterrence, from nosecone to rocket engine, we are upgrading the ICBM fleet, and it is going to be with us beyond 2025, because of the investments we are making today in that system. And we are providing a more secure system, because of the investments that we are continuing to make in our launch facilities.

And in satellite communication is probably the most dramatic that we can think of, as we move to wideband global satellite launches this year, which in a single satellite will exceed the capability of the entire DSCS constellation, AEHF satellite and the TSAT program, which will be absolutely essential to keep us on the cutting edge in the future.

All of these systems support our vision at Air Force Space Command to become the acknowledged experts and leaders in launching, fielding, and employing space power for America for the 21st century.

To guide our investments along this path, we have four priorities that we stay focused on.

First, we absolutely must preserve and expand our ability to deliver space effects to the joint fight. We stay focused on the needs of the Combatant Command (COCOM) today, not only the regionals, but the STRATCOM commander as he operates and defends our space assets. But we also are committed to look to the future, to make sure we stay out in front.

Second, we remain focused on providing a safe and secure nuclear deterrent for this Nation. Of all the balls we juggle in Air Force Space Command, I remind our folks most of them are tennis

balls that will bounce if we drop them. This is a crystal ball. We stay focused—very focused—on this responsibility.

Third, we are committed to developing, fielding and sustaining dominant space capabilities for this country on time and on cost. And with SMC under our umbrella in Air Force Space Command, we are working to make sure we can do that, and are good shepherds of the taxpayers' investment.

Finally, and certainly not least importantly but underpinning our efforts, we are focused on attracting, developing, training and retaining the expertise necessary to meet the challenges of the future. Our investments in the NSSI has been mentioned—the National Security Space Institute—our investments in education.

It goes beyond that, though, and goes into examining policies for accessions. It goes into recruiting. It goes into getting young folks excited about joining Air Force Space Command. And I can't think of a more exciting place to work than this command.

In closing, I would just, as our chief of staff has said in his testimony that, as he looks at air forces historically, where air forces across history have failed is when they have failed to correct slowly to declining relative capabilities.

Our space capabilities are too integral to the fight today. We understand that. And we cannot allow adversaries to eclipse our asymmetric advantage, particularly as Dr. Kerr talked about.

We realize the importance of investing today to get what we need for tomorrow. And we also realize we absolutely must be successful every day. And what we do is, we operate these systems for the fight.

With your help, we stand ready to solve the challenges of the future. And I am honored, as I said, to appear before this distinguished subcommittee. I appreciate the great support you give the men and women of Air Force Space Command, and I look forward to addressing the questions that you put before us today.

Thank you.

[The prepared statement of General Chilton can be found in the Appendix on page 67.]

Ms. TAUSCHER. Thank you very much, General.

And, gentlemen, thank you very much for comprehensive submitted testimony and your verbal testimony.

The committee is generally, obviously, concerned about many different issues, but what we are looking at is to have a sense of the scope of the opportunity to improve security and awareness of our assets on-orbit.

And I think that we are looking at and questioning and pushing to find out what kind of seams we have, both institutionally and in space, because our responsibility is to the warfighter.

Our responsibility to protect the United States, our citizens, our assets and our allies is significant. And in partnership with you, we feel as if we have not only great Americans in the Joint Command working very hard, but as Dr. Kerr mentioned and as Dr. Sega has mentioned in the past, too, we have some of the finest scientific minds.

And how do we make sure that we have both the kind of operational institutions, the kinds of flexibility, the kind of robustness

we have in our institutions that do not leave us either with seams in the institutions or eventually seams in space?

So, I guess the question that I have to begin is, are we investing enough in Space Situational Awareness capabilities that are needed to deter and defend and recover from possible threats against our safe assets and their related ground infrastructures?

What are the greatest needs we have in these areas?

And how do you see the organizational roles and responsibilities being divided or shared, both during creation of architecture, development of the concept of operations and the fielding of capabilities?

And I think that should go to you first, perhaps, Dr. Sega, but I would be interested in both of you, General Chilton and Dr. Kerr adding on if you can.

Dr. SEGA. First, that is a very important question.

We lay the foundation for some of the options, starting in 2001. And at that time, I was director of defense research and engineering.

And we made a conscious effort in the science and technology foundation to increase the investment in space, and increase it in the area that includes Space Situational Awareness and protection.

And the budget doubled in space, and it was around a half-billion a year, and went to over $1 billion a year. And we are now seeing the results of that investment in terms of the capability to do such things as Space Situational Awareness.

The TACSAT–2 experiment satellite launched in December is one example; XSS–11 is also another example.

But in terms of providing a sensory capability and bringing it together and making it make sense, I think the foundational pieces are coming into play.

So, we have been, I think, in the correct direction. The question is, have we gone fast enough at this point, knowing what we know now to provide that.

We also have in the National Space Policy, situational awareness is clearly brought up, where the roles of the Department of Defense and the intelligence community are laid out, and the importance of Space Situational Awareness is there, as well.

It includes not only a terrestrial component, but a space component. So it needs to be viewed as a system.

And more and more, as we look at space in general, all the parts should also be participating in our increased awareness of what is in space.

As we put the budget together, we looked at continuity of service and made sure that we had those key areas. Missile warning, strategic communications and position, navigation and timing were examples I gave there. There are others.

And so, we have laid out a direction that is good. We also said that there were additional dollars available, and that Space Situational Awareness was our first choice, and that in that list of self-awareness, Space Situational Awareness was on top of that.

Some of the activities that we have in the budget, it would be possible to accelerate those, but I believe our direction was solid. Our foundation has been laid.

And I will at that point turn it over.

General CHILTON. Thank you.

Madam Chair, first of all, I think one place where we do not have a seam for sure, is a clear understanding of the combatant commander's role and responsibility in this. And General Cartwright, who we merged U.S. space into STRATCOM and called it STRATCOM, it still has the U.S. space mission in there. And he appreciates that and he is leading that effort.

One of the great things that has happened this past year is the standup of JFCC–SPACE as a separate command. I had the good fortune to be the previous JFCC–SPACE and Global Strike commander.

And so, I have been paying attention to the needs of General Shelton out at 14th Air Force for well over a year, and asking what it is that we need, what do you need as your number one priority. And it has been improved Space Situational Awareness.

It is a fundamental thing that every commander—land, sea or air—needs first before you do anything else. You need to understand the environment, who the good guys are, who the bad guys are, who the neutrals are, and then what people are doing in that environment.

One of the key elements in that, if something goes wrong, is to be able to attribute what caused the malfunction. So, if it is a mechanical malfunction or an electrical malfunction with a satellite, you need to know that. If it is something caused by the space environment that you operate in, you need to know that.

And if someone is messing with your satellite, you need to know that and be able to attribute it fast.

And so, these are kind of the key elements of Space Situational Awareness.

Recognizing this need, even last fall as we were working on the budget and we laid in the integrated Space Situational Awareness line, and those are the beginning steps as we start to meet the needs of the combatant commander, as represented through General Shelton.

Some of the steps we have also taken is to integrate the first space control squader, now in his command and control facility out in Vandenberg, and break some of the linkages that we had with the Cold War mentality of how we surveilled space, and allow us to upgrade systems like our Space Defense Operations Center (SPADOC) computer, that was designed and built in 1991, and it is still operating today.

We need to move that technology forward and give General Shelton the tools he needs.

Besides that, I would say the other challenge I put before our Space Command team—and this kind of goes in line with what Dr. Kerr talked about, how his satellites—a lot of his satellites were designed to address a Cold War threat. The same with our space surveillance systems that are set around the world today, both our radars and optical systems.

I have challenged our team at Air Force Space Command to take a clean-sheet look at the future. How would you lay this out, given what we know today? It is not just a Soviet threat we are worried about. There are other potential threats, many more players in the domain, a lot more debris.

How would you lay this out? And we are well into that work right now to lay out our future needs.

The final thing I would say is that, as we look at all the investment programs, including improving the fusion capability of data that we have coming in today, we are taking some operations and maintenance risk to pay some of those bills.

And that might be an area where we have to keep our eye on it and could use some help in sustaining our current levels as we implement new systems to take us to the point that we need to be.

Ms. TAUSCHER. Dr. Kerr, do you have anything to add?

Dr. KERR. Just a couple of points to supplement what you have heard.

We have been operating in space under threat for many, many years, starting with the co-orbital ASAT fielded by the Soviet Union.

Protection is part of our programs traditionally. It is getting even more emphasis today. We look at things like how do we distribute value differently, in order to be more robust.

At the operating level, we are very well integrated with what General Chilton just talked about. As I mentioned earlier, we provide the deputy commander for JFCC–SPACE.

Importantly, the JSPOC—the Joint Space Operations Center in California—is linked to our NROC and their backup capabilities for each other. And we have recently expanded our facility and re-equipped it for that responsibility.

Importantly, we started out working closely with Space Command, because to some great degree they have had clear responsibility in this area for developing capabilities for space surveillance—SSA, if you will.

To that team has come STRATCOM. And so, the three organizations are working very closely on how different capabilities can be linked to deal with today's problem, rather than yesterday's problem, and will continue to do that.

Ms. TAUSCHER. Thank you.

Happy to yield to the Ranking Member, Mr. Everett.

Mr. EVERETT. Thank you, chairman.

What are our gaps in SSA? Clearly, we need to know the Chinese ASAT—we need to know who did that, when they did it, that kind of thing.

Do you see any gaps that we have in Space Situational Awareness?

General CHILTON. Representative Everett, if I could take that one on.

We have a satellite airborne now called the Midcourse Space Experiment (MSX) satellite. It was put up as an experiment to actually look at others things. The technology is back in the late 1990's.

What we found as we operated that satellite, is that it had a great capability to surveil the geosynchronous belt and help us in keeping track of objects out at great distances from the Earth.

The radars that we have today do a pretty good job of surveilling in the low-altitude orbital environment.

As we look to the satellites in the higher altitudes, we find that there is an area that I think we need to continue to focus on improving our capabilities, which is why the space-based space sur-

veillance system, which you will see in our budget this year, is—and has been in the past—is so important to us to get airborne on time, because MSX is starting to fade in its ability to continue to do its mission.

So, I would say we need to expand—continue to expand—our focus on space surveillance, not only to the low-altitude areas where we clearly have seen that we are vulnerable, but also to the higher altitude areas and beyond. And this is an area that we are focusing on.

Dr. SEGA. And consistent with the need to have SBSS, the space-based surveillance system, to be in space, we have approached it in the same manner, in this block approach.

So we are not taking on too much in the first block, block 10, and getting capability on-orbit with confidence in terms of our schedule, and the resources needed, and then moving on to a block 20. It is for this need, applying the approach so the acquisition cycle time is reduced.

Mr. EVERETT. Anything to add, Dr. Kerr?

Dr. KERR. Just one point. If there is any area where there is a clear gap, it is good intelligence about what other countries are doing relative to space control and space surveillance.

And over the years, some of that capability, particularly on the analytic side, has diminished substantially. So, building hardware, building concept of operations (CONOPS), absent some better foundation of understanding of what we are building them for, is a risky thing. And that part needs attention, too.

General CHILTON. I would echo those comments, sir.

And in line with the question you had asked earlier about intelligence and what we are doing on that, I think in the Air Force, with General Deptula taking over the A–2 and increasing that to a three-star level function, I have had many discussions with him about the importance of focusing our intelligence again to the heavens, as we did during the Cold War.

After the Cold War ended, we took down a lot of that capability, because the threat had gone away. And that capability I am mostly talking about is the human capital that we had paying attention to intelligence analysis of the space environment.

And we are starting again to build—and it will take time—that expertise, both in the Air Force at National Air and Space Intelligence Center (NASIC), as well, and also, in our management of the space cadre, which was another question you asked earlier.

My intention is to expand our management and oversight of that beyond just our space operators and our acquisition professionals, but to also include intelligence and communications specialists in our Air Force, and make sure we are tracking their growth and make sure we are growing the right intelligence expertise we need for today and tomorrow, as well as the right communications expertise we need to support our space endeavors in the future.

Mr. EVERETT. I appreciate that. I hate to see so many of our young people coming out of the academy who want to be pilots and spend a great deal of their time—the rest of their life, maybe—piloting a Global Hawk rather than get in an aircraft.

Anyway, SATCOM. This year we buy about $400 million from commercial satellites to do communications. And about 80 percent

of our Iraqi Freedom military SATCOM requirements come from commercial.

Would you explain all that and how it concerns with down-the-road TSAT, and more quickly, the Advanced Extremely High Frequency (AEHF)?

General CHILTON. Yes, sir.

Mr. EVERETT. And also, I think the Advanced Extremely High Frequency would give us 100 times more than we get now?

General CHILTON. Ten times, sir.

Mr. EVERETT. Ten times.

General CHILTON. Ten times.

Mr. EVERETT. And TSAT?

General CHILTON. About another 10 times, so close to 100.

So, you are right. The demand, the need for global satellite communications, particularly force secured to support our warfighters, continues to grow.

And we recognize those requirements. We are listening to the users out there who are demanding them.

And that is why it is so important to field the Wide-Band Global System that, as I said, one satellite will replace the capability of the entire DSCS constellation, and AEHF, with about a 10-fold increase in capacity and capability over MILSTAR, and the TSAT.

With regard to your comments on the 80 percent, the fact that today about 80 percent of our satellite communication is leased, again, this is under the COCOM's purview and how that is managed.

But it is not something that I think you want to ever drive down to a zero number. And I like to use the analogy of the civilian reserve air fleet that we have, the CRAF, and how we utilize that for airlift in crisis.

Day in and day out, we have relationships with the airlines, that they are flying their airlines supporting civilian traffic.

But you will notice, when we get to crisis and the time comes, we activate the CRAF and we bring them on board. And you will see most of our soldiers, sailors, airmen and Marines deploying to theater in DC–10's. And you will see them going in 747s that are part of the airline industry.

I kind of in my mind equate the balance that we have to strike with military capabilities, just like we have military transport in the CRAF. On military satellite communications, we have got to make sure we size it right for what you have got to have to fight. And it is nice to have a flex capability, where you can utilize the commercial satellite industry where you are able to.

But back to your original point, the growth in demand is increasing for secure and protected satellite communications for our warfighters. And that is why it is so important to stay the course on these new satellites we are developing and launching today.

Dr. SEGA. If I could continue on that.

The commercial satellite providers are important to us. It is part of a balance, and I hope optimized push going forward.

We have a commercial SATCOM CEO meeting annually. And we had that recently. And so that we are better able to work with them and share information and so forth.

But communication does come, as General Chilton said, in different forms and for different reasons. Commercial folks can provide part of it, and we provide some of the upcoming wideband communications with WDS—Wideband Global Satcom—system. And that will be launched this summer. And it is another program that is meeting those milestones.

It is ready to go and we are looking at the launch vehicle now and putting that part together and getting the first WGS out here in the summer, and then six to nine months later the next one and then finally the next one.

And we also executed the contract on widebands four and five over the last year. So, that is the wideband part.

But this protected communications base is MILSTAR and then AEHF and then to TSAT.

And TSAT approaches the problem in a different way, a 21st century way. It not only will do the protected piece, but will also serve our many, many users that want this capacity through an Internet protocol based—a network, if you will, in space.

And so, we have a processor router on that. We communicate it at high bandwidth that the users are needing with lasers as we move forward. And there are also the high-band needs of our platforms that need ISR.

So, strategic communications, the Internet-based protocol for multiple users in that high bandwidth is what we are going for with TSAT.

And so, we have it broken down. We are doing the technology maturity in a methodical way in a block approach to provide 21st century capability, and staying in tune with the industrial base.

If we would go back and do an AEHF–4, for example, the parts—there is a parts obsolescence and non-recurring kind of engineering as you move forward in time. Especially in the communications area, the rate of change is high.

And so, to tap back into an industrial base with something that is from the past, we have to assess it and see how much it is really going to cost, as in some pieces you are starting over, because the parts are no longer available, or the design is not appropriate as we go forward.

So, that is a balance. And we have looked at that pretty carefully.

Mr. EVERETT. I understand it is both the commercial and DOD for our current military communications with SATCOM. But do we need that much of a reserve? Do we need to continue spending $400 million a year? Or is there some magic number below that, so we can keep a healthy commercial capability out there?

General CHILTON. Sir, I do not know the answer to what the right balance is, economic from a business case is.

I think we do need to have participation from the commercial satellite industry. I think that is healthy that we utilize that.

And again, I would reiterate the point that we do need to pay attention to the specific military requirements that are needed by Army, Navy, Air Force and Marines, and how we bring those capabilities to bear through our secure and protected satellites in the bandwidths that Dr. Sega has talked about.

Mr. EVERETT. Thank you, Madam Chair.

Ms. TAUSCHER. Thank you, ranking member.

At this time I am pleased to yield five minutes to the gentleman from Iowa, Mr. Loebsack.

Mr. LOEBSACK. Thank you, Madam Chair.

I just have some—I guess I want to pursue this question of intelligence a little bit. I mean, this is a request for—this is a budget hearing. And you all know that we are in a highly constrained budgetary environment at the moment, have been for a number of years.

I am new to the Congress. One of the first things I learned when I got here budgets here are strapped—was just how constrained we are at the Federal level.

And I would be asking the same kinds of questions, I guess. But do we really need what people are asking, whether I was on this committee or a committee having to do with domestic, whatever the case may be.

But I have stated before that, for me at least, we have got to line up whatever it is that we are going to be spending, or expending, on the military with the threats that are out there.

And correct me if I am wrong, but what I got from what you just said a little while ago was that we have real problems with intelligence in terms of whether we have enough intelligence—human capability, in particular, you mentioned—to determine exactly what those threats are out there.

And I guess, I do not know that you can give me any kind of numbers, but I have a real concern that we develop weapon systems for which there are no threats, because that would be a waste of our money, obviously, if that were the case.

How confident can we be that, you know, what you folks want to do in fact will be directed toward threats, given the concerns that you have all expressed about our intelligence capabilities?

How also—I guess, what are the chances that we do not know what some of the threats are, and therefore, we are not providing you enough in that sense, to take care of the threats that we do not even know about perhaps?

Whoever wants to take that on.

Dr. KERR. Well, since I was the first of the three of us to raise it——

Mr. LOEBSACK. Yes, you were. You were. Thank you.

Dr. KERR [continuing]. Let me take the first cut.

From my own experience, I know how far, particularly in the all source analytic world, we have gone from capabilities that existed 10 to 15 years ago in terms of numbers of analysts, to what we had a year or so ago and they are now starting to build up from.

But I guess, to put it in numeric terms rather than a headcount, which I cannot do, we probably went to a point of having probably ten percent of what we once had in the area of looking at threats to space systems.

As General Chilton properly pointed out, NASIC remains a strong capability focused largely on the military intelligence side of it. Where it has fallen down substantially is in the all source end of it.

It also would be unfair of me not to point out that your colleague, Mr. Reyes, hears this in quite a different setting, and it is a concern that has been broadly expressed.

Mr. LOEBSACK. Anyone else?

General CHILTON. I did not want to characterize that there was a deficiency in our knowledge of the threats. I think we are pretty understanding of the threats.

It was a deficiency in the human capital and focus we have put there. That is just a reality, as Dr. Kerr pointed out, as a result of our drawdown after the Cold War.

It is a new day and we need to be looking forward and growing the right expertise as we move forward in this area, and putting the focus on it that it deserves. And I am confident we are doing that. But this is not something you fix overnight.

Dr. SEGA. But from probably a perspective looking out a little bit further, one of the things we can guarantee, I think, in the 21st century is, the rate of change of technology will increase. The technology will be available around the word.

And so, with that rate of change, we also have to look forward and make sure that we understand that and we also stay on the leading edge and we provide options as we go forward.

And so, one of the areas that we intend to have to move quickly and have agility and provide some of those options is the ORS, with some of the smaller satellite activities that we will kind of understand the technologies, with their opportunities to see how they work.

We will also give ourselves potentially additional options going forward in terms of operations. But we are at the beginning stage.

We are also recognizing we are in an environment that is going to have a high rate of change going forward.

Mr. LOEBSACK. Thank you very much. I will yield back the rest of my time.

Thank you, Madam Chair.

Ms. TAUSCHER. Thank you, Mr. Loebsack.

I am happy to yield to the gentleman from Arizona, Mr. Trent, five minutes. Mr. Trent? Franks. [Laughter.]

Mr. FRANKS. I get that all the time. Thank you.

Well, thank you, Madam Chair. And I thank all of you for being here, as always. You know, you are our front line of freedom, and we appreciate you very, very much.

I know that General Obering is not here, but any time that you have the kind of success related to missile defense or the Air Force's participation, as you did last week in the ABL test, that is a cause for celebration for everyone. And so, I congratulate you in that regard.

General Chilton, I think that I want to, if I can, take a little page out of the chairwoman's book here and just revisit the critical nature of what you do to give us Space Situational Awareness, because I know that there are some differences of opinion in this committee in terms of priorities on how to go forward in a lot of areas.

But the one thing that should be a common commitment on the part of all of us, is to know what is happening in our world. To know who might be a potential adversary, to be able to prevent

misunderstandings—to know what is happening is critically important.

And I just believe that anything that we do will have as its foundation much of what you are doing. And so, I guess, if I could ask you, if there was any one thing that this committee could do to ensure that your effort to give us a good picture of what is happening in the world and Space Situational Awareness, what would that be?

General CHILTON. Thank you, sir, and thank you for your support for the men and women of Air Force Space Command.

It would be sustaining our investment in the path that we are on today.

We identified, as I mentioned with my experience as JFCC–SPACE, this need and deficiencies more than a year ago. And we have laid them into the funding streams now.

It runs the gamut. It runs the gamut from the intelligence side so that we can be predictive and we have got the right analysts, to the data collection side, which are our sensors that we deploy around the world and in space, like the space-based space surveillance systems, to taking that data and that information and bringing it into General Shelton's Joint Space or Operations Center and fusing that, so he does not have to look at spreadsheets to fuse things in his brain, but we present that data correctly, so that he can quickly make decisions and provide good advice and counsel to General Cartwright as the combatant commander for operations there.

It will also, this situational awareness, help us better support regional warfighters around the world. So, in the integrated Space Situational Awareness program which we have in this budget, will help to take the data that we bring in and fuse that in a fashion in our command and control center that General Shelton has.

And it does not stop there, sir. It goes right—and once you are smart, now you have got to be able to command and control your forces. And we have investment planned in those areas, too, so that he can send his orders out and the folks that operating the systems out in the field can respond to them in an appropriate fashion.

But it runs that gamut.

Mr. FRANKS. Well, thank you, gentlemen. Your cooperation with the intelligence community and all the other people that you have got to interface with is pretty much a model for the services, and certainly for the U.S. Government in general, and we appreciate that very much.

Dr. Sega, I know you have seen the bumper sticker a lot of times in your business, that one nuclear blast can ruin your whole day.

And we appreciate very much that you are trying to figure out ways to prevent that from ever being something that we would see come to reality.

And I know that your challenge oftentimes is to make sure that we are investing in the kind of systems that will provide deterrent to nations in the future, like China, so that they decide not to build certain, perhaps offensive capabilities against us, simply because they do not think it is a good investment anymore, and also, the ability to have a tactical response, if something really does occur.

So, I ask you the same question. What can we do in this committee to be able to continue to equip you to do both?

Dr. SEGA. Sir, let me answer it from the perspective of the space systems, and then I will hand it off for probably a broader look.

One of my roles in the past was the chair of the Radiation Hardened Oversight Council, the RHOC, as the director of defense research and engineering, when we looked at paths forward for providing radiation-hardened components.

In our protected systems that we are counting on, we do provide our requirements and we design and build the systems with rad-hardened components, such as the strategic communications—MILSTAR, AEHF and then TSAT—and things like missile warning for SBIRS-High.

So, we are increasing the capability of our systems to operate in these environments.

In addition to that, looking at an option for more rapid reconstitution, and that goes to a bit on the ORS effort, potential future capability of reconstitution.

And so, we have efforts in providing protection on the satellites, as well as to look at options for potential reconstitution. And we hope it never, of course—that never is needed.

General CHILTON. I would just say, sir, as I mentioned earlier, we are taking some risk in our sustainment of our current systems out there in our O&M. And that would be an area that we could use some help on.

You know, we have talked about missile defense, the first alert for missile defense is the Air Force Space Command's systems that we deliver with DSP, now SBIRS, within our mid-course tracking as provided by our radar systems and the upgrade of those systems that are so important to us. And sustaining those systems are very important to us, as well.

Thank you, sir.

Mr. FRANKS. Thank you.

Thank you, Madam Chair.

Ms. TAUSCHER. You are welcome, Mr. Franks.

I am happy to yield now five minutes to the gentleman from Texas, Mr. Reyes, who is also the Chairman of the Intelligence Committee.

Mr. REYES. Thank you, Madam Chair.

And thank you, gentlemen, for being here.

I think Dr. Kerr and I have seen each other every day this week in some form or another, and mostly working on issues of this type.

It occurs to me as I sat here listening to both your testimony and the questions, you know, everything that we do in this arena is so expensive. And one of the fundamental concerns about this investment is that it may not be balanced to what should be the biggest priority.

Being a nation at war right now, the overriding priority is getting intelligence to the warfighter.

There are some that are concerned that, as we invest heavily in our ability to continue a space presence, and certainly the threat against our assets after the Chinese ASAT is of concern to all of us.

But is our portfolio in balance in terms of supporting the warfighter? Because it appears that it is overly weighted toward transformational issues and our long-term policy to be able to maximize our presence in space.

But, again, in your opinion, are we in the right balance, or are we in an imbalance at this point in time in what should be our primary priority, and that is giving the warfighter the kind of intelligence that they need in combat?

General CHILTON. Well, Representative Reyes, first of all, it is good to see you again, sir.

Mr. REYES. Please. Good to see you.

General CHILTON. If I could, I am going to defer some of the intelligence portions of your question to Dr. Kerr.

But I think, if we look back from 1991 and Desert Storm to where we are today, and how we conduct combat operations today in the global war on terror (GWOT) and in any contingency to include such things as hurricane relief and disaster in the United States of America, and our country, we have become very, very dependent on the capabilities that we bring from space today to conduct those operations.

I love the story that General Dodgen used to tell about asking the young soldier, do you need space today to fight? And the story is, he says, no, all I need is my rifle, my box of ammunition and that little black box over there that tells me where I am.

Mr. REYES. Right. [Laughter.]

General CHILTON. Well, that is a perfect example of just how we have taken space and made it a part of our fabric, whether it be position, navigation and timing, which has found its way into not only just telling you where you are at, but also into the timing that is critical to the operation of our communications systems, our Nation's banking systems, et cetera, let alone the economy.

When we look at global communications, the Global Hawk, the Predator—all these things that are in the fight today that are providing real-time intelligence to the warfighter in the field and are helping them find IEDs and helping them to accomplish their mission today—they all rely on satellite communications.

And what they are screaming for is more of that capability. And that means it is going to require more satellite bandwidth to support.

Most folks do not think about that other step that is required to do that. So, I think we are on the right track there in the communications growth that we have in the program today and in moving forward on GPS constellation.

Missile defense—if you talk to the combatant commanders over in Korea today, and you ask them how worried they are about the North Korean threat and their missile arsenal over there, and in other AORs, too, you will find how focused they are on early warning and detection and tracking of those threats. And that is exactly where we are spending our capital in regards to upgrading the DSP program to the SBIRS program.

So——

Mr. REYES. If I could interrupt you, because that is an important point.

As we deal with the transformation process, particularly in the Army for Future Combat Systems (FCS), is that what the combatant commanders are telling you? First of all, what they need on the short term, what their vision is for long-term support from space.

I am kind of curious, because I think they are all related.

General CHILTON. They are, sir.

They have short-term needs, and we are delivering those today with our space capabilities, but they have long-term needs, too.

And the growth in airborne ISR, the growth in Space Radar as that comes along onboard, which they are all asking for and requiring, and the data rates that will be required to support that will require increases in our satellite communication constellations.

And the com-on-the-move requirements of SCS that you brought up, and the vision the Army has for how they will build and communicate in the future on the battlefield is an important part of the transformational satellite system, TSAT.

So, we are chartered not only to look at, and we pay very close attention today in our flexibility and how we support today's fight. But we have to be looking to the future, as well.

And as I said before, I think all the things we are investing in have become so much a part of the fabric of the way we fight and the way we think about fighting in the future, that we have a good, balanced investment in this area.

Dr. KERR. Let me follow-on, on another piece of the answer to you, Mr. Reyes.

I mentioned earlier the fact that we are now supporting real-time warfighters on the ground. The even better part of that is that we have been able at some of the ground facilities to bring overhead collection capability together with airborne collection capability and make that immediately available.

One way to dramatize it for you is that I have seen a young operator with national feeds available, UAV feeds and manned airborne feeds with 20 chats open simultaneously to people on the ground in Iraq.

And so, this linguist was adding value to the feeds, and then she was passing it on immediately to those who could use it on the ground for either targeting or protection.

Dr. SEGA. And if I could add one further point.

As was mentioned by General Chilton, the needs today that come from space, such as from GPS, the position, navigation and timing aspects and communications, those satellites do not live forever. And we do not have an option in space to have a depot to put another wing or new engines, or something, on the system.

And so, there is a continuity of service that we need to consider. And GPS, as I gave the example earlier, sustains the constellation.

We currently have 30 satellites in there. And that number helps—those numbers of satellites—for folks getting a signal in an urban environment and in a canyon.

But many of the satellites are quite old and they need to be replaced. We need to replace it with what is available with technology, and also address some of these new needs.

The folks on the ground need a GPS system to operate, and anticipating some jammed environment—that occurred a bit in OIF.

And so we add power, principally for the folks on the ground in terms of anti-jam with the next generation GPS.

But continuity of service for continuing that today into the future is clearer, I think, from PNT and communications, as well as missile warning and along with that, a more capable satellite that will help the battle space characterization and tactical intelligence, as well.

Mr. REYES. Thank you.

Thank you, Madam Chair.

Ms. TAUSCHER. Thank you, Chairman Reyes.

I am happy to yield five minutes to the gentleman from Ohio, Mr. Turner.

Mr. TURNER. Thank you, Madam Chair. I want to thank you for your continued efforts in this committee. I have enjoyed working with you.

Ms. TAUSCHER. Thank you.

Mr. TURNER. And the amount that we are learning is a great deal of help to all of us.

Dr. Sega, Dr. Kerr, General, I want to thank you for your work, knowing that your importance in trying to maintain and grow our superiority, and also the important issues of having to defend what is a significant strategic vulnerability of ours.

When you look at our vulnerability for space assets, I liken it somewhat to a cookie jar that you put on the top shelf, only your adversary keeps getting taller. You keep having to determine what height and what location you need to place the cookie jar in order to defend it.

And in looking at that, it seems that intelligence, obviously, is an important theme throughout everything that you are undertaking, especially in the area of defending our space assets.

And I wondered if you could speak for a moment—and I have a follow-up question to this—on the adequacy of the intelligence that you are currently receiving, whether or not you believe that the intelligence is currently sufficient for the countermeasures that you may need, and whether or not this is an area where, in order to develop our defensive measures, that you need more intelligence in support.

General CHILTON. Sir, we have talked a little bit—thank you for your question—we talked a little bit earlier about where we are and where we need to go with regard to our analysis and ability to analyze intelligence and focus in this area.

Now, perfect intelligence never exists. Ultimately, what we are after is not only determining capabilities of a potential adversary, but also intent. And that takes a lot of study and time.

And there has been some recent activities that we are all aware of that makes one wonder what the true intent of people are when they do that. And it is in this area, in particular, that as we grow our intelligence expertise and focus in space, that will be very beneficial to us as warfighters to understand that—not only capabilities, but intent.

Mr. TURNER. Dr. Sega, I know that in some of the briefings that we have had, you have called on NASIC at Wright-Patterson Air Force Base to help provide us information about their work.

And I have grown increasingly concerned that the Defense Intelligence Agency, DIA, is looking at actually lessening or diffusing the amount of resources that might be available.

We have a limited amount of resources, and instead of bolstering them, if we look at dividing them, our effectiveness can be diminished significantly.

So, my question to you and to others is that—you know, my understanding is that NASIC has, with the resources that they have, has been a very high performer.

And do you have concerns as to whether or not we are meeting the needs at the level of support that we need for intel?

Dr. SEGA. I can only address it from my perspective of my interaction with NASIC. And they are doing an outstanding job and very, very professional.

With respect to the interaction with the DIA, I would like to refer that to them, if I could. But we are in full support of the information and the work and the folks that have been providing that for us. And that helps in terms of understanding the investment portfolio going ahead, is the information you have and the intelligence.

So, they have done a great job from my perspective. And I would either refer to someone else for the answer now, or take it for the record to go into your question further.

Mr. TURNER. Sure. Are there others who would like to comment?

Dr. KERR. I would echo the support for the work that NASIC's done. It has been outstanding.

General Chilton mentioned the issue of intent. And nothing has dramatized the problem we have with that more than the Chinese ASAT test, where it may appear, based on the public information that even the Chinese Government itself had different arms with different intent.

And so, that is where the all source analytic capabilities of DIA and CIA become so important. And that is really where we need to focus some attention.

General CHILTON. Sir, if I could just add, one area where we do have control in Air Force Space Command and, I think, great influence on the Air Force. One is with the A–2, General Deptula as I mentioned before, he is increasing resources focused on space intelligence for the Air Force.

Additionally, though, as I mentioned earlier, as one of our key rules in Air Force Space Command is making sure we have the right talent in the Air Force Space Command for the future.

And you look at General Shelton and he is running an air operations there in Space Operations Center there out at the JSPOC at Vandenberg Air Force Base.

And a critical element of his decision-making and supporting the warfighter, General Cartwright, is rooted in his intelligence shop and division out there and the work that they do.

And we are starting to pay attention now how we raise intelligence officers in the United States Air Force in a fashion that, when they achieve the rank of colonel or lieutenant colonel, or as an analyst, we want to raise them specifically to go into those areas to support space. It does not mean they will spend the whole time in space.

But if we have got someone that is passing through and has had an opportunity to study and be an intel analyst in space, today we do not capture that very well in our assignment process, and we are working to fix that and bring them into a career-wide management to make sure General Shelton has what he needs to support his operation as the JFCC–SPACE.

Dr. SEGA. And just one last point. The value we see in NASIC is so high that we have them come in monthly and present topics for our community here in the Washington, D.C. area. So they come back on a monthly basis, at least, and work through topic after topic.

Mr. TURNER. Thank you, gentlemen.

Thank you, Madam Chair.

Ms. TAUSCHER. Mr. Turner, I just wanted to let you know that your support for NASIC is a committee support. We appreciate that your advocacy is on behalf of what could be seen as a parochial interest, but it is a committee shared support.

And Mr. Everett, who also sits on Intel, I have just talked to Chairman Reyes about doing a classified hearing on all source. Perhaps Dr. Kerr and others would be involved in it.

But we do have a crossover between our subcommittee responsibilities and had two responsibilities in this area, so we will be scheduling a classified briefing as soon as we can get it up on a calendar.

Thank you for your interest and your support.

Dr. Bartlett has joined us, and we are happy to see him. Dr. Bartlett is a member of the full committee, and I think he has a question.

I am happy to yield you five minutes.

Mr. BARTLETT. Thank you very much for permitting me to join you.

Ms. TAUSCHER. Of course.

Mr. BARTLETT. Gentlemen, welcome.

Dr. Sega, good to see you again.

When the Electromagnetic Pulse (EMP) Commission questioned two Russian generals, they told the Commission that the Soviets had developed, and the Russians now have, EMP-enhanced weapons that would produce 200 kilovolts per meter at the centers, which would be about 100 kilovolts per meter at the margins of our country, and, of course, equivalent intensity in space.

If this is true, can you tell us in this setting if our MILSTAR satellites would survive this radiation?

General CHILTON. Sir, I do not think this is the appropriate setting to discuss capabilities and/or vulnerabilities, specifically. But I will say that our MILSTAR satellite system and the AEHF systems are designed to provide the communications that the President needs in time of nuclear conflict.

Mr. BARTLETT. Beyond these fairly limited systems intended for command and control, essentially, what other space assets do we have that are EMP-hardened?

Is the answer "little or none"?

General CHILTON. Well, we certainly work to harden the secure communications that were required to conduct those type of oper-

ations in a nuclear environment—nuclear war—as you have alluded to, sir.

Mr. BARTLETT. What percent would you say of our total military communications moves over EMP-hardened satellites?

General CHILTON. Sir, I would have to take that question for the record.

[The information referred to can be found in the Appendix beginning on page 104.]

Mr. BARTLETT. Is it something like the five percent level or less?

General CHILTON. Again, sir——

Mr. BARTLETT. Would that be a fair——

General CHILTON. I would have to take that for the record, sir. But we will get an answer for you.

Mr. BARTLETT. Dr. Sega, you mentioned that we have plans to reconstitute in the event that we lost satellites.

If we lost our satellites as the result of an EMP event, it is my understanding that all of the unhardened satellites—which essentially is all of the satellites, except the few that were mentioned—would be gone from prompt effects if they were line-of-sight, and the other satellites would decay quickly as a result of the Van Allen Belts being pumped up—which if, in fact, the Russian generals are correct, that they have a weapon that would produce 200 kilovolts per meter, would be quite some enhancement of the Van Allen Belts.

The only way we could really reconstitute, then, would be with EMP-hardened satellites, would it not? Because if we launched a new satellite it would similarly, rapidly decay, because of the pumped up Van Allen Belts. True?

Dr. SEGA. A thorough discussion is appropriate probably more in a closed session. But let me clarify the reconstitution piece.

We are just at the first stages of doing tactical satellite experiments in terms of rapid reconstitution. So, we are on that path, but we are a ways away from looking at that option in an operational sense.

The effects that we look at in space are several-fold. And then on the ground, as you mentioned, the EMP is a strong electromagnetic wave, there is also the issue of particles, which would be different than the effect that you mentioned.

And so, as we look at the design of satellites and the needs of the warfighter and the potential environments they need to operate in, we do need to consider all these different aspects. And I will leave it at that.

Mr. BARTLETT. If I use a physiological analysis of where I think we are, I think that we are sufficiently hardened so that, if I was representative of our military capability, my brain and spinal cord would work, but my arms and legs would not.

And I am not sure what good signals would do me running around in my brain and spinal cord, if I had no arms and legs.

And I think this is a reasonable analogy as to what our military would look like after a robust EMP lay-down. I think that we would have little or no warfighting capability remaining, other than nuclear.

Is that incorrect?

General CHILTON. Sir, again, I do not think we want to get into discussions on capabilities and vulnerabilities here. But I do not—when you start talking a nuclear conflict here, I think we are talking about a different level than what we have been talking about here today.

Mr. BARTLETT. I want to thank you very much for permitting me to come. And I would—if you would welcome me to your closed hearing, I would be pleased to come there, too. Thank you very much.

Ms. TAUSCHER. Not only that, Dr. Bartlett, what I am going to offer you is, if your military legislative assistant (MLA) would be willing to work with Ms. Ramsay for questions for the record, I think that is a better forum and a better, more classified opportunity for us to deal with these issues.

And, of course, we will invite you to subsequent classified hearings on these issues, and I appreciate that you have a significant interest in this area, and we share that interest.

Thank you very much.

Gentlemen, the committee generally, and the ranking member and I, specifically, have concerns about black and white space coordination and other issues.

And I am going to yield to the ranking member to make an offer.

Mr. EVERETT. Thank you very much, Madam Chairman.

I do have concerns that we are not looking closely enough at the emergence of black and white space. And I particularly think that Secretary Teets did a great job when he was here in trying to get us down that path.

I think Space Radar may be a good idea—I mean, a good example of that.

It seems to me that—Dr. Kerr, I heard what you said about it being a joint effort now. But I would make the suggestion that the IC tried to kill Space Radar with 1,000 different cuts.

I am also interested in the merging of black and white space where possible. Where is the NSSO in this?

And I understand again this year that DOD and the Air Force have cut any funding of personnel at NSSO.

So, what I would like to do, and the chairman has kindly offered that we invite Dr. Sega and Dr. Kerr—and perhaps a couple of others—back for a hearing on this a little later.

Ms. TAUSCHER. In a more classified setting.

Mr. EVERETT. When we have a more classified setting.

Thank you, Madam Chairman.

Ms. TAUSCHER. I thank the ranking member.

And let me thank our staff for doing such a great job.

Gentlemen, I know that you have lots of people behind the scenes that enable you to have such significant testimony before us. We want to thank them, too.

We want to thank you for your service to the country, and I think we are going to be seeing you sooner than we expected. That is a good thing for everyone. Thank you for all of your hard work.

This hearing is adjourned.

[Whereupon, at 11:00 a.m., the subcommittee was adjourned.]

# A P P E N D I X

March 23, 2007

**PREPARED STATEMENTS SUBMITTED FOR THE RECORD**

MARCH 23, 2007

DEPARTMENT OF THE AIR FORCE

PRESENTATION TO THE HOUSE ARMED SERVICES COMMITTEE

UNITED STATES HOUSE OF REPRESENTATIVES

SUBCOMMITTEE ON STRATEGIC FORCES

SUBJECT: NATIONAL SECURITY SPACE POSTURE

STATEMENT OF: HONORABLE RONALD M. SEGA

UNDER SECRETARY OF THE AIR FORCE

March 23, 2007

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

## INTRODUCTION

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

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

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

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

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

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

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

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

## UPDATE ON SPACE

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

### LAUNCH

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

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

MISSILE WARNING

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

COMMUNICATIONS

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

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

POSITION, NAVIGATION, AND TIMING

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

OPERATIONALLY RESPONSIVE SPACE

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

## INTEGRATION

We continue to emphasize integration and collaboration across the national security space community; across functional areas such as Intelligence, Surveillance, and Reconnaissance (ISR); and among DoD entities, other government agencies, industry, academia, and Congress. Integrating architectures also become increasingly

important as systems become more capable of dynamic tasking and mutual cueing, and protection of our space capabilities become even more important.

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

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

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

Our acquisition approach also emphasizes integration and collaboration among interested parties in all stages of the acquisition process. Our goal is to create partnerships within the space community, which are critical to this community's

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

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

**"BACK TO BASICS" IN SPACE ACQUISITION**

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

This "Back to Basics" approach focuses on "mission success" in our space acquisition programs. "Acquisition" links technology with operations--turning ideas into

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

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

Though "Back to Basics" is not a quick-fix solution to space acquisition, we have begun to realize the benefits of using this approach. Adhering to its key principles (proper management of requirements, risks, and resources) yields dividends, but this is a continuing process that requires our continued commitment.

In the FY07 President's Budget Request, the Air Force applied the block approach to the TSAT program, which is critical to maintaining continuity of service in Strategic Communications. The "Back to Basics" philosophy and block approach are also now being applied to several other needed capabilities: Missile Warning systems (e.g., SBIRS and the Alternative Infrared Satellite System (AIRSS)); Space Situational Awareness (e.g., Space Based Surveillance System (SBSS)); and Position, Navigation, and Timing (e.g., GPS III). Thus, programs with defined, executable block strategies should reduce production risk, while delivering incremental capabilities to the warfighter sooner, and maintaining continuity of service.

MISSILE WARNING

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

Ensuring technology maturation occurs before transitioning from development to production is a key part of the "Back to Basics" philosophy. Entering a system

production phase with mature technology reduces schedule and cost risk, puts needed capability into the warfighters' hands sooner, and ensures we deliver what we promise on schedule, supporting continuity of service. Each operational capability area, such as missile warning, should have an investment strategy and portfolio that goes beyond the current program of record, to include needed work to support successive generations of technical capability, both for space and ground elements.

COMMUNICATIONS

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

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

POSITION, NAVIGATION, AND TIMING

Continuity of Position, Navigation, and Timing (PNT) capability is critical for military, civil, and commercial applications, and GPS is the world's standard for space-based PNT. Using GPS, military and civilian users can access highly accurate, real-time, all-weather, position, navigation, and timing data--24 hours a day, 7 days a week. Assured GPS capability is crucial to the success of many missions, from

humanitarian relief to weapons employment, and the Air Force is committed to continuity of this critical service. To that end, we will continue to make improvements to the constellation; including new civil signals, more jam-resistant military code, new receivers, and increased accuracy. In 2006, interagency coordination was strengthened through an active National PNT Executive Committee (EXCOM), co-chaired by the Deputy Secretary of Defense and the Deputy Secretary of Transportation, and the stand-up of the National PNT Coordinating Office.

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

Through a comprehensive review process and Joint Requirements Oversight Council (JROC) validation, GPS III requirements were developed, and include: increased power beyond GPS IIF, an L1C signal, enhanced crosslinks, and spot beam capability. These capabilities will enhance our current GPS capability, and we plan to deliver these capabilities incrementally. The first block, GPS IIIA, will incorporate GPS IIF capabilities plus a tenfold increase in military (M-Code) signal power, a new L1C civil signal compatible with Galileo, and a growth path to future blocks. GPS IIIB will then incorporate the enhanced crosslinks capability, and GPS IIIC will provide spot beam capability. In the case of GPS IIIA, we will carry both contractors through Key Decision Point B, so that we can leverage ongoing risk-reduction activities. The JROC

validation of the GPS Block IIIA initial Capability Development Document addendum supports this block approach strategy for GPS III.

OPERATIONALLY RESPONSIVE SPACE

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

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

SPACE SITUATIONAL AWARENESS

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

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

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

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

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

## SPACE PROFESSIONALS / SCIENCE & ENGINEERING WORKFORCE

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

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

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

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

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

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

**CONCLUSION**

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

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

I look forward to continuing to work with the Committee and thank you for your continued support of our Air Force, and our Nation.

Statement for the Record by

Dr. Donald M. Kerr

Director

National Reconnaissance Office

Before the House Armed Services Committee

Subcommittee on Strategic Forces

March 23, 2007

**Introduction**

Madam Chairman, Distinguished Members, thank you for the opportunity to come before your committee to discuss the Fiscal Year 2008 (FY08) National Reconnaissance Office (NRO) program and budget request.

The NRO is a joint organization engaged in the research and development, acquisition, launch, and operation of overhead reconnaissance and related ground systems necessary to meet the needs of the Intelligence Community (IC) and the Department of Defense (DoD). NRO satellites and ground systems support on-demand, world-wide signals, and geo-spatial collection, as well as special communications services enabling a number of other, high-priority intelligence activities. Policymakers, intelligence and military users, and civil agencies all rely on NRO systems for support critical to continued US intelligence dominance.

NRO systems are integral to military operations, supporting battlespace preparation, precision targeting, wide-area surveillance, blue force tracking, and battle damage assessment, as well as providing near real-time support to ongoing tactical operations. NRO systems also provide the

foundation for a variety of analytical activities, including unique indications and warning, access to denied areas, and sustained target monitoring capabilities. Finally, consistent with legal statutes, regulation and policy guidance NRO systems are playing an ever-increasing role in support of homeland security, law enforcement, and other civil support missions, such as border protection and drug interdiction.

Simply put, NRO systems provide the US with a distinct asymmetric advantage in a world that is defined by rapidly changing targets and threats.

A few brief examples of how the NRO provides operationally responsive capabilities include:

- Providing timely support for Combat Search and Rescue operations for downed aircrews in Iraq;
- Helping to identify technical solutions to counter the use of improvised explosive devices;
- Developing a web-based tool, subsequently transitioned to the National Geospatial-Intelligence Agency (NGA) for operations, that allows posting and sharing of imagery products worldwide and that has actually saved lives because of its quick-turn around capability;
- Directly engaging with our users to provide immediate technical information to an anti-narcotics inter-agency task

force that resulted in seizure of two ships carrying five metric tons of cocaine.

- Working with our Mission Partners to provide support for various civil applications, such as security planners for major public events and disaster relief both at home and abroad.

**Changing Threats**

Increased awareness of the importance of space dominance as a force multiplier for military operations, particularly for the US, is accelerating the development of foreign, sophisticated counterspace technologies. This was dramatically illustrated by the successful demonstration of a Chinese direct ascent anti-satellite (ASAT) test on 11 January 2007, but the space-based threat to US systems is broader. Any threat analysis must consider this broad-based space threat, as well as the threats to our own ground networks and our communications infrastructure.

An effective response to these threats requires an improved understanding of our adversaries' enabling systems for threat engagement, including space situational awareness for targeting, command and control links for decision-making and coordination,

as well as the mission impact to US operations. This knowledge will form the basis for developing responsive protection strategies at both the platform and the architectural level.

**The FY08 Program Priorities**

The changing threat environment and the changing nature of our targets were both drivers to our FY08 request. The NRO satellite constellation of today provides the world's most capable collection and processing systems, yet intelligence problems are becoming more complex. Our Imagery Intelligence (IMINT), Signals Intelligence (SIGINT), and Communications architectures provide global intelligence, surveillance and reconnaissance, and near real time support to the warfighter, and offer critical contributions to the Global War on Terror (GWOT). At the end of the day, the NRO must strive for acquisition excellence and deliver on its commitments.

**Revolutionize the NRO -- From the Ground Up.** The NRO's performance in the GWOT has demonstrated that overhead systems, designed in a different era and against a different problem set, can be adapted to collect against small, agile targets -- with dramatic success. This adaptation to become "operationally responsive space" has been done on the ground. This is where we can best respond -- by developing and deploying

new algorithms and processing improvements to keep up with rapidly changing technology and stay ahead of evolving threats.

In order to build on our record of success, I have consolidated NRO ground system programs into a single Integrated Ground Development Effort. Moreover, I have appointed a Ground Mission Manager to lead NRO ground-based efforts toward a Unified Ground Architecture, and to work with our partners in the Defense Intelligence Agency (DIA), the NGA, and the National Security Agency (NSA) toward an Integrated Ground Architecture. This new emphasis on the ground will not only ensure we get the most value from our investment in overhead systems, but is a "must have" to solve the most intractable intelligence problems. We simply must transition the data fusion efforts of today -- people talking -- to the fully automated fusion required for tomorrow. Human interaction and discussion should not be required to fuse data--only to make decisions resulting from that data.

**Space Radar.** The FY08 budget marks the first jointly funded, National Intelligence Program and Military Intelligence Program, request for Space Radar; demonstrating their commitment to the program as the single, future Space Radar system serving

both intelligence and military needs. This is critical. The Space Radar integrated program office, led by Air Force Major General Tom Sheridan (also a Deputy Director of the NRO), continues the work necessary to ensure a sound requirements and technology base for the Space Radar program toward a planned first launch in 2016.

**Research and Development (R&D)**

The FY08 request also sustains the strong commitment to R&D necessary to mature the technologies required for next-generation IMINT, SIGINT, and Communications satellites, to further the revolution on the ground, and to respond to new threats. The R&D program is also exploring numerous "leap ahead" capabilities that appear to be very promising against some of our most intractable intelligence problems.

**Financial Management**

The NRO places great emphasis on the integrity of its financial data and processes. Beginning with FY00, the NRO has undergone annual financial statement audits by an Independent Public Accounting firm, which have demonstrated significant quality in our financial management processes and controls. Basic funds management processes at the NRO have received high

scores since FY00. Indeed, the NRO Inspector General has noted that the investment in terms of systems, processes, and training to achieve this level of corporate financial management has been significant and represents NRO management's commitment to strong financial management. Regardless of the outcome of each year's audit, the NRO remains the only member of the IC to have achieved an unqualified opinion on its audits.

**Furthering the New National Space Policy**

On August 31, 2006, the President signed the new National Space Policy, the first overarching national policy governing the conduct of US space activities to be issued in more than ten years. The NRO was a member of the interagency team that developed the policy, and is now working to ensure it is fully implemented.

I have already mentioned a number of NRO programs and initiatives, such as a strong R&D investment, the new emphasis on ground, and capabilities that respond to the new threat, which are all in complete consonance with the new National Space Policy. Other NRO initiatives are highlighted below.

Develop Space Professionals. The National Space Policy encourages the development of space professionals. The NRO believes the importance of the space professional workforce cannot be overstated -- it is absolutely essential to the success of the NRO, as well as the larger space community. To

that end, the NRO has taken a number of steps. First, we have completed an Air Force-NRO Statement of Intent (SOI), signed by the Director, NRO and the Air Force Chief of Staff. The SOI makes clear that the Air Force and NRO will work together to improve the career development of our space professionals. This includes additional training opportunities, enhanced mentoring, and a deliberate approach to assignments. This new approach to assignments is aided by the creation of an Air Force-NRO Space Assignment Advisory Board that is actively tracking the careers of space professionals to ensure they are provided the job experiences, as well as the education and training, necessary for their professional advancement. The NRO has also teamed with Air Force Space Command in training space professionals across the government at the new National Security Space Institute in Colorado Springs. I am working similar initiatives with the CIA. Finally, the NRO's Acquisition Center of Excellence is helping NRO acquisition professionals, program managers, and finance and contract officers complete education requirements leading to advanced professional certifications or Masters Degrees in Public Management or in Engineering Administration.

These initiatives are in addition to an already robust Systems Engineering (SE) Professional Development and Certification Program that last year certified 151 system engineers. This successful effort has prompted the development of a similar course for Program Management.

**Improve Space System Development and Procurement.** Improving the NRO's systems acquisition process has been a focus of mine since I became the Director, NRO. We have abandoned the "acquisition reform" practices of the 90s that proved so unsuccessful, and we are returning to acquisition fundamentals. The transition will not happen overnight. There are programs that were started in the "acquisition reform" era that must be successfully completed, and there were people trained in that era who must be re-trained. However, we are making demonstrable progress.

**Demonstrating Performance.** As part of the President's Management Agenda and the Government Performance and Results Act, the Office of Management and Budget (OMB) evaluates at least one major NRO program each year. Three NRO operations and acquisitions programs have been evaluated to date: IMINT, SIGINT, and Communications. Scores for all three were "passing" or better. Moreover, the scores have consistently improved since the OMB reviews began in 2004. The most recent score of 81 percent for Communications, compared very well to the best in government programs. In addition, the Mission Integration and Development program, the ground portion of the Future Imagery Architecture, was recognized last October by the DoD and the National Defense Industrial Association as one of the DoD's Top Five Programs. This award recognizes programs displaying

excellence in the application of systems engineering best practices resulting in program success.

**Increase and Strengthen Interagency Partnerships.** The National Space Policy also mentions the importance of interagency partnerships. This is a natural for the NRO, since it is fundamental to the history of the NRO, and inherent in everything we do. The NRO is a partnership -- a "joint-venture" between the DoD and the IC. We extend that partnership to other IC agencies and DoD elements to ensure end-to-end solutions to user needs. These include routine interchanges at all levels with our partners, such as NGA, NSA, and DIA, as well as to more formal venues for cooperation, like the Space Partnership Council. The Council, which includes the Air Force Space Command, US Strategic Command, National Aeronautics and Space Administration (NASA), and Defense Advanced Research Projects Agency (DARPA), considers broad issues affecting the nation's space programs, and allows senior leaders to collectively address those issues. Finally, in order to ensure the NRO remains responsive to an ever-expanding user community, I established the Deputy Directorate for Mission Support (DDMS). The DDMS is specifically focused on improving our understanding of user needs, and ensuring the full capabilities of the NRO and its partners are brought to bear in satisfying those needs. The DDMS has a new additional responsibility as Deputy Commander,

Joint Functional Component Command for Space, under the US Strategic Command. Through these and other efforts, the NRO is helping to achieve the unity of effort called for in the National Space Policy.

**Strengthen US Space-related Science and Technology (S&T).** The National Space Policy calls for strengthened U.S. space-related S&T efforts. As I have said, S&T is a key enabler for the NRO, and we maintain a strong S&T investment. However, we also coordinate that investment with others to ensure no duplication of effort. Moreover, we fully leverage the investment made by others, including NASA, the Missile Defense Agency, DARPA, the Air Force, and other IC and government elements involved in space. We host an annual Technology Forum to extend that cooperation and collaboration to private industry. Finally, we sponsor a program called the Director's Innovation Initiative to involve non-traditional suppliers of technology and innovation.

In summary, the President's policy sets challenging goals for all of us in the space business, and I am confident that the NRO is doing its part to meet or exceed those goals.

**Conclusion**

The resources identified in the FY08 request will address an aging constellation and known risks, allow the NRO to sustain critical intelligence capabilities to a growing base of intelligence-dependent users, and take important steps toward ensuring we deliver end-to-end solutions to user needs. It also sustains the R&D investment necessary to keep pace with rapidly evolving targets and threats.

Madam Chairman, I appreciate the support that Congress has shown in the past. I look forward to your continued support as we work through the challenges and opportunities in the coming year.

Thank you.

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UNTIL RELEASED BY THE
HOUSE ARMED SERVICES
COMMITTEE STRATEGIC
FORCES SUBCOMMITTEE

**STATEMENT OF**

**GENERAL KEVIN P. CHILTON**

**COMMANDER, AIR FORCE SPACE COMMAND**

**BEFORE THE**
**HOUSE ARMED SERVICES COMMITTEE**
**STRATEGIC FORCES SUBCOMMITTEE**
**UNITED STATES HOUSE OF REPRESENTATIVES**

**ON**

**MARCH 23, 2007**

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FORCES SUBCOMMITTEE

## INTRODUCTION

Madam Chairwoman, Representative Everett and distinguished members of the subcommittee, it is a great privilege and an honor to appear before you today representing the nearly 40,000 men and women of Air Force Space Command (AFSPC). Thank you for your interest in and continued support of our Air Force's space capabilities. Your leadership has focused resources towards maintaining the asymmetric advantage that our Airmen deliver to, through and from space to the joint fight. I am honored to share this stage with Dr. Ron Sega, our Under Secretary of the Air Force and Dr. Don Kerr, Director of the NRO, two great leaders I'm proud to join on our National Security Space team.

Today, I am pleased to report our United States Air Force's space capabilities have never been more impressive. Each day Air Force Space Command Airmen demonstrate they are the Nation's experts in operating our Air Force's space systems by providing critical support to every one of our Combatant Commanders in the form of Missile Warning; Missile Defense; Space Surveillance; Position, Navigation and Timing (PNT); Environmental Monitoring; Strategic Deterrence; Satellite Communications, Space Launch and Counterspace capabilities. As we reflect on the contributions the Airmen in Air Force Space Command delivered over the past year, it is clear we are now operating in an era where space provides an unparalleled advantage for our armed forces.

This unmatched advantage that enables our joint, interagency and coalition operations must be protected. For that reason, our Air Force has laid out a strategy to support recapitalization efforts, while assuming some risk in our operations,

maintenance and personnel accounts. Just as our Chief of Staff, General Moseley, testified, "Air Forces fail when they do not correct slowly declining relative capabilities." Our space capabilities are too integral to the fight to let our forces down...or let an adversary eclipse our advantage. We realize the importance of investing today to get what we need for tomorrow.

This 2007 posture statement articulates our Nation's critical reliance on space capabilities. At the birth of our Command 25 years ago, space capabilities were in their infancy. Today, Combatant Commanders depend on integrated space effects to successfully execute their missions. To keep our radar locked on meeting those growing demands, our Command developed a vision and a set of four focused priorities through which we will achieve future success.

## VISION AND PRIORITIES

The foundation of our Command was built by pioneers like the "Father of the Air Force Space," General "Bennie" Schriever and the first Commander of Air Force Space Command, General James Hartinger. The long line of great leaders up through my predecessor, General (Ret) Lance W. Lord, have all contributed to the success of our Nation's military space program today. Learning from our heritage, but with our eyes on the horizon, we crafted a vision that recognizes the important contributions of the past while also paving our path to future success. Our vision is to become the:

**Acknowledged Experts and Leaders in Fielding, Launching and Employing Space Power for the 21st Century**

The space effects we provide to the Combatant Commanders are second-to-none, due in large part to the bank of knowledge and spirit of innovation that keeps AFSPC on the cusp of the technological bow wave. Our Nation's and our allies' armed forces, our private citizens and millions of people around the globe, benefit today from capabilities provided by AFSPC. Every thing we do in this command is focused on enabling the joint fight, to win the war we are in today, and just as importantly, to insure we are prepared to win decisively in the future. Our active duty, Guard, Reserve, government service and contractor team are the best in their fields, and we want to leave no doubt in anyone's mind: when you have a question about America's military space and missile capabilities, the nearly 40,000 professionals of Air Force Space Command hold the answer. To help make this vision a reality, we have crafted four strategic priorities:

1. **Preserve and Expand our Ability to Deliver Space Effects to the Joint Fight**
2. **Provide Safe and Secure Strategic Deterrence**
3. **Develop, Field and Sustain Dominant Space Capabilities on Time and on Cost**
4. **Attract, Develop and Retain People with the Expertise Necessary to Meet the Challenges of the Future**

We have our sights set on these priorities. They serve to guide our focus in the way we operate today and to underpin the investments we need to make for our future.

## PRESERVE AND EXPAND OUR ABILITY TO DELIVER SPACE EFFECTS TO THE JOINT FIGHT

To achieve our first priority, we must do two things. First, we must preserve our ability to deliver space effects in today's fight. This means we must properly organize our forces, train them for success, and equip them with the tools necessary to protect our asymmetric advantage in space. Second, we must expand the capabilities we provide by always looking for ways to more efficiently operate our current systems while investing in the systems we will need tomorrow.

### Preserve our Advantage in Space

Preserving our advantage in space is a prerequisite for everything else we do. To achieve this, we first require the ability to effectively surveil the space domain with the goal of answering, in as near to real-time as possible, the questions of "who, what, when, where, how and why?" that are so vitally important to the commander responsible for operations in any domain. We refer to this as Space Situational Awareness. Breaking this down further we arrive at the key ingredients necessary to achieve the Space Situational Awareness we need. First, we must establish the right organizational command construct. Second, it is vital for us to maintain and field the correct mix of space surveillance capabilities along with the ability to rapidly fuse, analyze and display the data we collect in a fashion that will inform timely decision-making by our commanders. Next, we must be able to effectively command and control our forces. Finally, our ability to preserve our advantage in space will only succeed if we have

assured access to the domain through highly dependable and responsive launch vehicles. In 2006, Air Force Space Command made progress on all of these areas.

We solidified our support to United States Strategic Command (USSTRATCOM) with their assignment of Major General Willie Shelton, our Fourteenth Air Force Commander, as USSTRATCOM's Joint Functional Component Commander for Space. That one organizational change, coupled with the establishment of the Joint Space Operations Center (JSpOC) at Vandenberg AFB, CA, aligned warfighter functional responsibilities with Air Force space capabilities and expertise. This is a good news story in the leveraging of Air Force people and assets to lead in the joint space environment. Ultimately, this change produced unity of command in delivering joint space capabilities for the Combatant Commanders.

In the past year, this organizational construct was central to the delivery of over 18,000 mission essential products to regional Combatant Commanders supporting Operations IRAQI FREEDOM, ENDURING FREEDOM and NOBLE EAGLE. In CENTCOM alone, in the Combined Air and Space Operations Center (CAOC) in Southwest Asia, the Director of Space Forces received direct support from Maj Gen Shelton's JSpOC and the Airmen under his command operating the Defense Support Program satellite constellation. Together, they evaluated more than 2,100 infrared signatures in the CENTCOM AOR, enhancing battlespace awareness and force protection efforts for our Nation's deployed Soldiers, Sailors, Airmen and Marines.

Today, Air Force Space Command's worldwide space tracking and surveillance network provides positional data on over 15,000 space objects. Our expert team of orbital analysts used these data for satellite collision avoidance with space debris as

well as with other satellites. This analysis, in turn, helped safeguard over $50B in US space assets which are vital to our Armed Forces, as well as interagency, coalition partners and the American economy. However, recent events like the Chinese ASAT test, which added over 1,000 new pieces of debris to our previous count of 14,000, only serve to highlight the need for us to further enhance our ability to surveil the space domain.

Today, our surveillance, analysis and data-sharing capabilities do not adequately support our future needs to rapidly identify and understand the threats to our space systems. Given that limitation, we are working hard to make the most of every dollar spent in this area to optimize our surveillance function and give the Commander, USSTRATCOM a better understanding of our space operating picture. These efforts include working in close cooperation with the Missile Defense Agency to upgrade our Early Warning Radars, examining alternatives for funding upgrades to a vital Space Surveillance Network radar at Eglin AFB, FL, and sustaining the Mid-course Space Experiment (MSX) satellite, our sole space-based space surveillance system. On the heels of MSX are the Space-Based Space Surveillance (SBSS) Block 10 (launching in FY08) and Block 20 satellites which will provide critical enhancements to our need to surveil objects beyond Low Earth Orbit. Finally, we have begun a clean sheet look at requirements for how we should best surveil the space domain in the future.

The need for Space Situational Awareness (SSA) increases exponentially as our joint forces become more dependent on space. With our Nation's dependency on our space capabilities, in the future it will be even more essential for us to definitively identify the cause of any interruption in the delivery of our space-provided or space-

enabled capabilities. Just as importantly, we must also be able to attribute who or what caused any interruption. Meeting this requirement puts our space situational awareness needs on par with the air, land and sea domains. In every one of these domains, our Combatant Commanders can obtain a solid picture of the threat, allowing them to produce, in a timely manner, a wide range of response actions. This is even more critical in the space arena where the response time can be significantly shorter for commanders to make decisions which will impact the lives of thousands of our Soldiers, Sailors, Airmen and Marines. Furthermore, these threats to our space capabilities do not just exist in the space domain. We are staying equally focused on the other two critical elements of any space system; our ground stations and the communications links between the satellite, the ground station and the user. Without high fidelity and timely Space Situational Awareness, our national leaders will not have the key information needed to determine the range of available political, economic or military options to deter or counter future threats. Providing the Commander, JFCC-SPACE with the Space Situational Awareness he requires to effectively plan, operate and fight is our top concern.

To address this concern we are driving towards several significant milestones. In FY08, we will create an Integrated Space Situational Awareness program. Part of this effort entails creating a Space High Accuracy Catalog and replacing our 1991 vintage Space Defense Operations Computer with a net-centric, services-oriented architecture that will provide the Combatant Commanders and national users with actionable information on launches, satellite breakups, maneuvering objects and reentries. Additionally, the Rapid Attack Identification and Reporting System (RAIDRS) Block 20

program will better integrate and fuse space data (space intelligence, surveillance and space environmental monitoring) enabling JFCC-SPACE to better protect and defend critical space assets and respond to new and emerging threats, whether hostile or environmental. Each of these programs will help us meet our Space Situational Awareness needs.

While Space Situational Awareness is the foundation for all operations, Space Command and Control (C2) is what links the JFCC-SPACE to the joint fight. Commanders in every domain require a basic C2 capability over their forces, and the same holds true in space. Effective Command and Control allows us to deliver flexible, agile and responsive effects to the battlespace, be it land, sea or air. To accomplish this, we are developing a suite of enhanced command and control tools to synchronize space and air effects and improve support to joint/combined forces and national partners. For example, we are working hard to develop robust space C2 applications enabling the Joint Functional Component Commander for Space to rapidly process and satisfy space support requests from the regional Combatant Commanders. Major General Shelton and his team are doing an outstanding job, but to reach their maximum capability they simply must have state of the art equipment on-par with our other Air and Space Operations Centers. The tools currently under development will give the JFCC-SPACE a better understanding of the space environment and permit continuous collaboration with joint, national and coalition partners and make us more agile and responsive to the complex environment in which our Soldiers, Sailors, Airmen and Marines operate.

The final element of preserving our ability to deliver space effects to the joint fight is safely and reliably delivering payloads into orbit. The most critical portion of any spacecraft's life is launch. Today, due to the hard work of our men and women of the Space and Missile Systems Center, 14th Air Force, our two launch wings and a second-to-none contractor team, we stand at 50 successful national security payload launches in a row and have a 100 percent record of success with our new Evolved Expendable Launch Vehicle (EELV) class of vehicles (15 for 15 operational launches). In total, 8 NASA, 7 DoD, 1 commercial and 6 Space Test Program (STP) launches lifted off from our East and West Coast Launch and Test Ranges in 2006. Our most recent launch on 8 March 2007 successfully carried the STP-1 mission with six individual spacecraft on board. The impressive list of firsts for this mission include: the first launch of an Air Force payload on an Atlas V, the first Air Force mission with six unique spacecraft, the first dedicated EELV mission for the STP and the first Atlas V to carry multiple satellites to two distinctly different low-Earth orbits. This highly successful STP mission carried satellites from the Defense Advanced Research Projects Agency, Los Alamos National Laboratory, the U.S. Naval Academy and the U.S. Air Force Academy. In 2007, we will continue this pattern of excellence, continuing to prove nobody knows Spacelift better than Air Force Space Command.

As we work towards preserving our ability to deliver space effects we also remain cognizant of the fact there is no downtime for us, as our mission and training continue 24/7, 365 days a year. Each day we maintain a laser-sharp focus on expanding our ability to deliver space effects to our Armed Forces, Nation, allies and coalition partners.

**Expanding our Ability to Deliver Space Effects**

Expanding our ability to deliver space effects to the joint fight entails both sustaining and enhancing our on-orbit position, navigation and timing; communications, environmental monitoring, and missile warning constellations, as well as investing in new capabilities and systems to increase our responsiveness to warfighter needs.

Our current on-orbit constellations are second-to-none, including our flagship, the Global Positioning System (GPS). GPS continues to perform as the world's premier space-based positioning, navigation and timing system. GPS capabilities are integrated into nearly all facets of US military operations and give the American and coalition warfighter an unparalleled advantage. GPS is integral to numerous battlefield innovations, including the Small Diameter Bomb, the Guided Multiple Launch Rocket System and Joint Precision Air Drop System. We have also delivered nearly 100,000 advanced handheld GPS receivers to the field. US and coalition warfighters navigating with GPS across trackless deserts and employing GPS-guided munitions are testimony to the awesome effect GPS has on precision attack. Additionally, the increased accuracy of GPS-guided munitions has saved lives and reduced collateral damage.

GPS also plays a major role supporting day-to-day business activities within our global commercial economy. Our satellites enable accurate directions to any mapped location, safe and efficient air travel, navigable oceans and waterways, as well as more efficient use of maritime resources, emergency and rescue services and precise timing data for communication systems, electrical power grids, and financial networks. GPS has literally become a household name.

Efforts are well underway to sustain and modernize this global space-based navigation system, to ensure we meet the future needs of military and civilian users. We now have the first three of eight Modernized (IIR-M) GPS satellites on-orbit, a significant step towards offering new signals for military and civil users. First, the military signal (M-code) with enhanced encryption, will be transmitted on two distinct frequencies to improve anti-jam capabilities. Second, an additional civil signal will provide improved accuracy for civil, commercial, and scientific users. The next series of advanced GPS satellites (IIF), scheduled to launch in 2008, will have an extended design life of 12 years, faster processors with more memory, a new civil signal on a third frequency (L5) and increased power to reduce vulnerability to signal jamming. We are also making GPS easier to operate and maintain, by upgrading the GPS ground station control system from a mainframe system that is over 20 years old and becoming cumbersome to operate and repair, to a distributed architecture.

We just released the Request for Proposal (RFP) on the next generation GPS ground segment and look forward to releasing the GPS III space segment RFP, bringing us an improved space and ground segment intended to assure reliable and secure delivery of enhanced position, navigation, and timing signals. The GPS III Block A satellites will transmit a significantly higher-powered military signal. Other features will be a new fourth civil signal (interoperable with Europe's Galileo and Japan's Quasi-Zenith Satellite System). We are also developing next generation military GPS user equipment that will take advantage of the modernized military signal.

We have demonstrated time and time again that GPS is the world standard for PNT. No other system comes close to delivering the proven performance of the GPS constellation.

The demand for satellite communication continues to grow by leaps and bounds. Our fully operational Milstar and Defense Satellite Communications System (DSCS) constellations are the Combatant Commanders' workhorses. The increased capabilities of the Command and Control-Consolidated ground system are paying huge dividends. Engineering and contractor teams continue developing innovative tactics, techniques and procedures for maximizing bandwidth and increasing satellite life span.

Yet another capability available to the warfighter is the AFSPC-led Global Broadcast System (GBS). Via fixed and mobile injection points we provide world-wide, high-capacity, one-way transmission of classified and unclassified high-speed multimedia communications and information flow for on-the-move or garrisoned forces. GBS is used to transmit everything from near real-time UAV sensor feeds to critical intelligence data. One Army intelligence team providing support to Coalition-Joint Task Force 76 used GBS to download between 80 and 120 images of Afghanistan every day. It is akin to our very own satellite broadcast network and the reviews are phenomenal. Clearly, the joint warfighter appreciates and depends on the capabilities we provide from and through space.

Looking ahead, satellite communication (SATCOM) will continue to be an area of focus for us. In 2007, we will launch the first Wideband Global SATCOM (WGS) satellite. We are excited about this launch because this one satellite will have more bandwidth capacity than the entire Defense Satellite Communications System (DSCS)

constellation (9 satellites) currently on orbit. Adding satellites 2 and 3, both fully built and undergoing testing and integration, will further improve warfighter SATCOM capability.

The Advanced Extremely High Frequency (AEHF) Satellite Communications System is on schedule for launch in early 2008. Brigadier General Ellen Pawlikowski's joint service team at the Space and Missile Systems Center is completing the first satellite, with the second satellite scheduled for testing in July 2007 and the third satellite experiencing on-time progress as well.

Development of the Transformational Satellite Communications System (TSAT) is a high priority. Technology risk reduction efforts on the laser communications and the next generation processor router are going well. As Lt Gen Frank Klotz testified to last year, the TSAT constellation will enable "communications on the move" and will transform the Services' net-centric architectures including the Army's Future Combat System, the Navy's ForceNet, the Marine Corps' X-Net concept and the Air Force's Global Information Grid initiative. TSAT is an integral part of our Armed Force's future concept of military operations. Today, an 8"X10" image takes 2 minutes to transmit over Milstar. With TSAT, the same image will be transmitted in less than 1 second. A UAV image, which takes up to 12 minutes to send via Milstar, will be sent in less than 1 second with TSAT. We are working towards a System Design Review in April 2007 and ultimately a space segment contract award at the end of this year.

Despite this progress, MILSATCOM is an area for concern. We have reached the point in time where further schedule slips potentially affect both protected communications on the battlefield and the command and control of our strategic forces.

It is critical for us to successfully launch every satellite in the pipeline and to meet all current program timelines. Any significant reduction in resources, an AEHF or WGS launch failure or another slip to the TSAT program, could create gaps in our MILSATCOM coverage—something our Combatant Commanders cannot afford.

Another space capability entrusted to us is environmental monitoring. We launched our newest weather satellite, DMSP-17, in November 2006. DMSP-17 replaced a satellite that had been operational since 1995. What is amazing about that old satellite is that it had a design life of 3 years. Eleven years later it was still delivering critical support to the joint fight. Our dedicated professionals managed to extend the replaced satellite's lifespan by almost a decade! This is a true testament to our AFSPC/contactor design, operations and sustainment teams.

Many of our space systems have far-reaching capabilities that provide information for strategic and tactical users simultaneously. A legacy system from the Cold War, our Defense Support Program has shed its singular role in the Strategic Deterrent mission to become a critical ingredient in the Combatant Commanders' toolkit as a theater asset. With our pending final DSP launch, this constellation has exceeded all original expectations. This year we began a new era with the launch and on-orbit operational testing of the first asset of the next-generation of warning systems - the Space Based Infrared System (SBIRS). To date, SBIRs testing has exceeded all expectations and we are confident that the SBIRS constellation will be as revolutionary to missile warning as GPS has been to PNT.

It has been more than 5 years since an Air Force satellite suffered a major capability failure before reaching its intended design life. Every system in our portfolio

has exceeded its potential and provided more robust utility to the Combatant Commanders through improved and upgraded features as well as through innovations in the operation of each constellation. However, new threats and new battlefield requirements dictate our continued vigilance in preserving and expanding our ability to deliver space effects to the joint fight both today and in the future.

Along these lines, we are currently analyzing ways to develop space systems to deliver the following capabilities: 1) could rapidly augment current surveillance, reconnaissance, and communication platforms in response to the needs of a Combatant Commander; 2) could rapidly replace space assets disabled by attack or natural phenomenon, and 3) could rapidly deploy systems to support our Space Situational Awareness needs. Dubbed Operationally Responsive Space (ORS), this concept is centered on the rapid development, building, launch and activation of new and likely smaller satellite systems.

We have begun to experiment with smaller satellites with the launch of TacSat-2 on 16 December 2006. Once testing is complete, the spacecraft will be used in a series of joint demonstrations collecting data to make a recommendation of military utility. TacSat-2 will participate in Exercises TALISMAN SABER 07, EMPIRE CHALLENGE 07, VALIANT SHIELD and ULCHI FOCUS LENS 07. TacSat-2 along with TacSat-1, 3 and 4 will allow us to answer key questions on what capabilities we should focus on in the future to meet augmentation, replenishment or surveillance needs. Ultimately, any ORS system that requires the launch of a new satellite will require leadership of the integrated effort, from the booster, to the bus, to the payload, to C2 and data delivery

architectures. The Air Force and Air Force Space Command are uniquely populated with the expertise across these disciplines to develop and field these capabilities.

Providing leadership over these programs is a key responsibility of AFSPC and we are pleased to have the opportunity to currently lead vital aspects of ORS to include requirements validation, TacSat Military Utility Assessments and ORS Analysis of Alternatives (AoA) efforts. The planned standup of the ORS Office at Kirtland AFB, NM is a giant step forward in supporting future operational satellite development and procurement for this emerging mission area. The connection with our Space Development and Test Wing is also critical in the early years of the program to capitalize on best practices in emerging technologies.

**PROVIDE SAFE AND SECURE STRATEGIC DETERRENCE**

Of all the missions with which we are entrusted, Strategic Deterrence has the least margin for error. Thankfully, this Nation has the men and women of 20th Air Force and the leadership of Major General Tom Deppe to rely on.

Providing safe and secure strategic deterrence depends on the modernization of our current force and the infrastructure which supports it. To this end we have embarked on an aggressive Minuteman III modernization program. These efforts encompass modernizing every stage of the missile, the launch silos, and the command and control centers to meet our deterrence mission beyond 2025. Additionally, we remain actively engaged in efforts to replace an aging, but vital, UH-1N helicopter fleet to support ICBM security requirements.

**MM III Modernization**

Our AF team is modernizing the Minuteman III missile from nose to tail. The first Safety Enhanced Reentry Vehicle modification kit was installed in October 2006 enabling use of the MK 21 reentry vehicle from the deactivated Peacekeeper missile on our Minuteman III missiles. More importantly, this modern warhead provides USSTRATCOM planners with increased targeting flexibility and enhanced safety.

In the year ahead, we will continue modernization of all of our Minuteman III missiles with a sustainable schedule calling for Propulsion Replacement Program (PRP) upgrades for 96 missiles. The PRP upgrade replaces aging motors and propellant as well as environmentally unsafe materials and components. To date the program has completed 52 percent of its production run with 312 deployed in the field. In 2007, 73 Minuteman IIIs will complete Guidance Replacement Program upgrades which will replace some of the 1960s generation electronics in the guidance system, further extending the missile's operational life. This program has completed 69 percent of its production run and 442 are deployed in the field. Additionally, we have fielded more than 65 Propulsion System Rocket Engine (PSRE) upgrades across the fleet, accounting for 13 percent of the total production run. These PSRE upgrades replace components originally produced in the 1970s with a 10-year design life. Finally, we are excited about the improvements built into the future Reliable Replacement Warhead (RRW). This replacement warhead will make use of the best security technology available and allow for a credible nuclear deterrent with the smallest nuclear weapons

stockpile needed for national security purposes. While upgrades to the missile/warheads are critical, it is only one piece in a larger system.

**Modernization of Launch Facilities**

At our launch silos we remain focused squarely on improving security. Our ICBM Security Modernization Program contains three synergistic elements. First, concrete enhancements have been completed at all but one of our ICBM squadrons, ensuring our Nation's nuclear arsenal is safe and secure. The second security upgrade (the fast-rising B-plug) enables security forces to rapidly close an open missile silo in the case of an impending security breech. We began the first installation of this technology at Minot AFB, ND, in February. Finally, 20AF is capitalizing on technology by deploying a Remote Visual Assessment (RVA) capability to enhance physical security. RVA employs a remote video camera to provide situational awareness at unmanned launch silos, enabling our Security Forces to tailor and accelerate response force actions to deny unauthorized access. In addition, this upgrade allows us to more efficiently use our most precious but limited resource, our Airmen.

**Building on Previous Accomplishments**

In addition to the upgrades in progress, we are proud to have completed (last year) the four-year deployment of the $114M Rapid Execution and Combat Targeting Service Life Extension Program, the heart of our ICBM command and control element. This command and control upgrade provides increased responsiveness and gives planners additional flexibility to meet rapidly changing world situations and evolving mission requirements. When combined with the previously completed Minuteman

Minimum Essential Emergency Communications Network modernization of our communications links, we have achieved a tremendous leap forward in technology and operational C2 throughout 20th Air Force.

Equally impressive is the work we have accomplished, in partnership with the Wyoming National Guard, at the Nuclear and Space Security Tactics Training Center at Camp Guernsey, WY. Not only are we providing our security force warriors, maintainers and operators a much needed place to exercise their combat skills but we are also preparing Airmen for deployment with our Air Expeditionary Forces.

When we factor in all the upgrades to the Minuteman III weapon system we will have effectively reset the force to continue to provide unmatched deterrence through the third decade of the 21st century.

**UH-1N Helicopter Replacement**

Even with of all these upgrades, we can not lose sight of one final and critical piece of the ICBM puzzle, our UH-1N helicopter fleet. This aircraft is our fastest and only way of rapidly responding to potential missile field security breeches. The Air Force is examining alternatives for replacement helicopters and we are working within the budget process to secure replacements. As we replace equipment that is war-battered from overseas deployments, it is important to recognize that our aged UH-1N fleet is flying as hard as ever, right here within our own borders.

**DEVELOP, FIELD AND SUSTAIN DOMINANT SPACE CAPABILITIES ON TIME AND ON COST**

In the last year, we made great strides in acquisition and ushered in a new era with the opening of the Space and Missile Systems Center's Schriever Space Complex. Under the leadership of Lieutenant General Mike Hamel, we continue to make progress in developing, fielding and sustaining dominant space capabilities on time and on cost. Through a dynamic acquisition strategy, the sustainment of current systems, and the development of future dominant space capabilities AFSPC will achieve our goal of becoming the acquisition model for Department of Defense.

**Acquisition Strategy**

The cornerstone of our acquisition strategy lies in our "back to basics" approach to systems development, acquisition and sustainment. We understand just how important space capabilities are to the warfighter and we know the acquisition recipe that achieves results. Our comprehensive plan to get "back to basics" is already showing results in putting programs back on track and leading to a new generation of transformation and innovation based on solid systems engineering.

We continue our commitment to risk mitigation across the entire space portfolio. As Dr. Sega has outlined, one of the key ingredients is our "walk before you run" strategy. Past acquisition failures can be traced to over-optimistic estimates of the maturity of key technologies and misunderstanding the challenges associated with system complexity. Our block development approach changes that, enabling us to gradually introduce new technology as it matures.

Holding our leaders accountable is the key to the future success of this strategy. We are entrusting our top acquisition leaders with the authority they deserve but, at the

same time, demanding results. We cut down functional stovepipes and are horizontally integrating key processes across programs by better reorganizing functions like engineering, program management, finance, logistics, developmental planning and contracting. We are excited about the year ahead, as we continue "turning the corner" in space acquisition. We have always developed, fielded and sustained dominant space capabilities and we are confident we will go beyond that by producing tomorrow's space capabilities on time and on cost.

**Develop, Field and Sustain Dominant Space Capabilities**

With our strategy in place we turn our attention to developing, fielding and sustaining dominant space capabilities. Our new and upgraded systems have already begun delivering transformational results. The capabilities we enable for the Combatant Commanders will only increase as these systems gain traction and momentum. Later this year, we expect to begin payload assembly, integration and testing on the first Space-Based Space Surveillance Sensor. Also vital to the joint warfighter, our Advanced Extremely High Frequency satellite program is back on track to deliver positive results in the near future. As previously stated, the first Wideband Global SATCOM will lift off this year, providing an exponential leap in bandwidth availability. Meeting these, as well as all of our program commitments, will help ensure the asymmetric advantage of space is available to future generations of joint warfighters.

One of these absolutely critical programs is SBIRS. With the launch of the SBIRS HEO-1 payload, we demonstrated the SBIRS program is on the path to success. Not only is HEO-1 on-orbit, but as stated earlier, its sensor is exceeding performance

specifications and providing truly revolutionary results. This is good news for the upcoming SBIRS GEO satellite, which shares common sensors. The first GEO satellite is undergoing integration testing for its launch in 2008. As we close out a proud chapter in our history with the last DSP launch, we will open a new chapter with the delivery of the first Space-Based Infrared System geosynchronous payload (GEO-1) for integration with its space vehicle this year.

Our GPS constellation remains healthy with 30 satellites on-orbit, but increased dependence on this system requires us to push ahead with developing and fielding improvements. In 2007, we project the completion of thermal vacuum testing on the newest block of satellite, the GPS IIF. Again, this advanced satellite will provide tremendous advances in our PNT capability, making GPS more jam-resistant on the battlefield while delivering increased accuracy for civil customers.

As was previously mentioned, in 2006 we launched a Defense Meteorological Satellite Program (DMSP) weather satellite. After a picture-perfect launch, the space vehicle was checked out and placed into operational service in record time, another true success story in developing, fielding and sustaining dominant space capabilities.

While we sustain and modernize our on-orbit assets, we also remain committed to updating an aging infrastructure. The EELV's unprecedented record of initial successes literally translates into millions of dollars in savings. We continue to aim for 100% mission success with the new United Launch Alliance (ULA) initiative while implementing the "Buy 3" contracts

Another aging piece of infrastructure, the Air Force Satellite Control Network (AFSCN), had its last major modernization in the late 1980s with the installation of 286

computers. The current system is heavily impacted by obsolete, vanishing parts and reduced numbers of vendors. Currently, AFSPC is undergoing a cost-effective modernization of the AFSCN legacy system with off-the-shelf control and status equipment and new antennas that allow a more integrated and interoperable satellite network to support US government satellite operations.

The AFSPC launch and test ranges are modernizing infrastructure to upgrade radar, telemetry and data systems for reliable and responsive access to space through our Range Standardization and Automation Program. We are taking steps toward space-based range through the use of GPS to track boosters and efforts to explore future flight termination and data relay technologies.

We are also partnering with the Missile Defense Agency (MDA) to upgrade and field missile defense capabilities and enhance the defense of our homeland and our allies against ballistic missile threats. In 2007, we will enhance capabilities at two Upgraded Early Warning Radar sites: first at Royal Air Force Fylingdales, United Kingdom, followed by Beale Air Force Base, California. The next upgrade is in coordination for Thule Air Base, Greenland, with an anticipated completion in FY10. SBIRS has already established a fully-integrated Missile Defense capability and continues to improve burn-out tracking and projected impact prediction performance. Our efforts to achieve these capabilities are conducted on a non-impact basis to our primary mission of strategic missile warning supporting our Nuclear Command and Control System as directed in National Security Presidential Directive (NSPD)-28. Additionally, we are providing significant support to many MDA flight tests and the

necessary security for the operational ground-based interceptors at Vandenberg AFB, CA.

We have shown we can get "back to basics" with our space acquisition programs, and in the near future we will be providing incredible new capabilities that will accompany every single Soldier, Sailor, Airman or Marine into battle. We have a tremendous responsibility to support our warfighters, and it's through the amazing people of Air Force Space Command that I know we will succeed.

## ATTRACT, DEVELOP AND RETAIN PEOPLE WITH THE EXPERTISE NECESSARY TO MEET THE CHALLENGES OF THE FUTURE

Our fourth and final strategic priority is to attract, develop and retain people with the expertise necessary to meet the challenges of the future. Our Air Force Chief of Staff recognized this when he made the development of world-class professionals one of his top priorities.

One of our greatest future challenges is recruiting people equipped with the right skills to succeed in a much more dynamic and technologically challenging environment. Accordingly, we have placed increased emphasis on sustaining on-going force development and voluntary off-duty degree programs at each of our bases to facilitate career-long education opportunities. In 2006, using AF tuition assistance, Airmen in AFSPC completed 22,000 college-level enrollments, earning 66,000 advanced education credits, resulting in 1049 job enhancing degrees (associates to masters). Re-investing in our human capital like this runs in parallel with recapitalization of our infrastructure. In the upcoming year, we will also increase the focus on recruiting

cadets from the Air Force Academy and the Nation's other top colleges and universities into space-related career fields within the Air Force.

Our requirement for a highly educated and technical workforce places additional demands on our professional development efforts. We must strengthen the technical foundation of our people, and match those with technical degrees against specific job requirements. The National Security Space Institute, addressed this demand by expanding education and training opportunities, further cementing itself as the go-to place for space education. In the past 18 months, we've introduced the Space Integration Course (Space 300), offering it twelve times in FY07. We also offered 19 Space Application (Space 200) Courses, and continue to meet expanding needs by developing a Distance Learning version of our Space 200 curriculum which will reach a broader group of students including our traditional Reservists. In addition, 2 NAVOPS Advanced Courses and the first-ever Missile Warning and Defense Advanced Course were taught. In anticipation of modern warfighter demands, we are developing a SATCOM Advanced Course which will have its initial offerings within 12 months. We are poised to continue to offer NAVOPS and SATCOM Advanced Courses and to answer requests for a Space Superiority Advanced Course and a Rendezvous/Proximity Operations course as funds are made available. The surging demand for these courses has been remarkable, to include interest from many of our allies. Through all of these efforts we already see the benefit of our education programs with the outstanding job our Airmen are doing both from CONUS and in theater.

One Airman who has taken full advantage of the many educational opportunities is Major Toby Doran, a graduate of Space 100, the USAF Space Weapons Instructor

Course and the Air Force Institute of technology (degree in space operations). In 2006, Major Doran deployed from AFSPC (as part of a Joint Space Support Team, Camp Fallujah, Iraq) and helped identify a required modification in the Army's Guided Multiple Launch Rocket System (GMLRS) weapon system. The problem was the GLMRS system used old GPS data under certain conditions. Major Doran ascertained that if stale ephemeris data was passed to a rocket prior to launch, it could cause an error in the rocket's impact point. Major Doran, in coordination with our GPS Operations Center (GPSOC) and Director of Space Forces, engineered procedures to ensure soldiers employing GLMRS in Iraq and Afghanistan received immediate notification of GPS outages from the JSpOC and GPSOC. This is just one example of many where AFSPC Airmen used their education, technical training and operational experience to take responsibility for the combat effects we provide through space.

To maintain our momentum, we began an extensive effort to make it easier to earn advanced technical degrees. At our ICBM Launch Control Centers, we have fielded something we call Netlink. For the first time ever, our Missile Combat Crews are able to access the internet and complete distance learning courses while on-alert, underground. We also developed a pilot, five-course academic certificate program with the Space Education Consortium through the University of Colorado at Colorado Springs to further increase the technical knowledge of our space professionals. This consortium is comprised of 10 universities and 2 institutes throughout the United States, including an international member in Strasbourg, France. In fact, the first class of the certificate program, Systems Engineering, met in January 2007 with 20 AFSPC Airmen (officers and enlisted) providing glowing feedback about the program. Most of the

course work is completed via distance learning, and the members of this initial cadre will complete a space certificate program they can apply to a Master's degree in:

- Space Operations *(Master of Engineering),*
- Systems Engineering *(Master of Engineering),*
- Engineering Management *(Master of Engineering),*
- Business Administration *(with space emphasis).*

With your support, we can expand this pilot program to make it available to all of our Airmen. The Air Force Institute of Technology and Naval Postgraduate School have also developed dynamic new certificate and degree programs aimed at the development of our Airmen. We are excited about these programs, and the additional opportunities they provide for building the next generation of space leaders. Ultimately, our young men and women will hold the keys to the future success of our Nation's "invisible force." My promise in the year ahead is to further codify our space professional development efforts and produce a more robust and challenging program for our Nation's space professionals. In addition, we will continue to work across service boundaries and with the National Reconnaissance Office to get the right person with the right expertise in the right position to lead. We know that ultimately our most important job is to grow the future air and space leaders who will step into our shoes and make the next 25 years even better than the last.

**CONCLUSION**

This year our Air Force celebrates its 60th anniversary and AFSPC turns 25 years old. The force we built over the last 25 years is truly remarkable and the investments we made together are paying off on the battlefield. However, success in the next 25

years will require the same level of commitment. There is no doubt in our minds that our ability to operate in space is critical to our Nation, and so we must improve our investment in areas like Space Situational Awareness and C2.

Every Soldier, Sailor, Airman and Marine benefits from the capabilities provided by our space forces. Recapitalizing our space systems will ensure we have even better capabilities for our forces in the future. While you cannot see or touch many of our space capabilities, the Combatant Commanders know they are there and rely heavily upon them. The effects we deliver via the space domain will no doubt be an integral part of every future military operation. The men and women of Air Force Space Command are your "go to" experts for space, and with Congress' support, we will deliver what this Nation needs to ensure the asymmetric advantage our space forces bring to the fight today will be even more dominant in the future.

## QUESTIONS AND ANSWERS SUBMITTED FOR THE RECORD

MARCH 23, 2007

## QUESTIONS SUBMITTED BY MR. EVERETT

Mr. EVERETT. Please describe your view on the current state of "black and white" space integration and what should be done in this area in the future. Consider the areas of organization and management, S&T, acquisition, operations, and personnel, at a minimum.

Dr. SEGA and General CHILTON. I would characterize our integration efforts as collaborative and cooperative. While space is our common operations environment, we have distinct missions; however, we can leverage each others' expertise and resources to meet mission objectives. Last year the Chief of Staff of the Air Force and the Director of the National Reconnaissance Office (NRO) signed a memorandum that recognized the potential benefits of sharing expertise, best practices and lessons learned in developing, acquiring, fielding and operating modern space systems.

We have integrated organizationally; for example, Mr. Bruce Wilson, our Deputy Director for Air, Space and Information Operations was a senior civilian member of the NRO, while Major General Tom Sheridan, the Deputy Director of the NRO is an Air Force general officer who came from Air Force Space Command. This is a great first step to improving formal interagency collaboration and long-range planning.

Acquisition and Science & Technology (S&T) are additional areas where we are working jointly, and where we can continue to break new ground in areas of mutual benefit. For example, as Dr. Kerr testified, the President's Budget contained the first jointly funded approach to Space Radar consolidated under single program management. In addition, the NRO Deputy Director for Advanced Systems and Technology participates in the AFSPC S&T process that develops space programming guidance for the Air Force. This collaborative approach to space acquisition and S&T maximizes our resources on common spacecraft issues, and is where I foresee greater cooperation in the future.

With respect to personnel and operations, we continue to work across service boundaries and with the NRO to get the right person with the right expertise in the right position to lead in the joint space environment. The Air Force provides nearly half of the NRO's workforce, while the Navy, Army and Marines also provide technical and support staff. We have created a joint space assignment advisory board to track the careers of space professionals to ensure that they are provided the job experiences, as well as the education and training, necessary for their professional advancement.

Mr. EVERETT. What specific organization and management mechanisms are in place to address "black and white" space integration issues? What forum(s) exist for decision-making on issues across "black and white" space?

Dr. SEGA and General CHILTON. The mission of the National Security Space Office (NSSO) is to enable National Security Space decision-making. Two NSSO guiding principles are to embrace cross-community, "joint" DoD and Intelligence Community (IC) perspectives and serve the needs of the Secretary of Defense and the Director of National Intelligence. One product of the NSSO supporting acquisitions was the creation of the National Security Space (NSS) Acquisition Policy 03–01 which establishes a common guidance for DoD and IC space programs.

An Air Force-National Reconnaissance Office (NRO) memorandum signed on 7 June 2006 defined several management mechanisms to enable integration. As a result, the Deputy Director of our Air, Space and Information Operations Directorate is now a senior civilian member of the NRO. Similarly, the Deputy Director of the NRO is an Air Force general officer who came from Air Force Space Command.

We have several forums such as the Space Partnership Council, which includes senior representatives of Air Force Space Command, NRO, U.S. Strategic Command, the DoD Executive Agent for Space, NASA, CIA, and Defense Research & Engineering (DDR&E) organizations, as well as AFSPC S&T Councils, Defense Advanced Research Projects Agency (DARPA) Days with AFSPC, and AFSPC–NRO Focus Days that provide agency leaders the means to discuss and reach agreement on collaborative efforts.

Mr. EVERETT. Who or what organization or management construct is responsible for overseeing the protection/defense of U.S. space assets? What processes are in

place to address and enforce space protection within individual space acquisition programs and across the enterprise?

Dr. SEGA and General CHILTON. The United States Air Force is responsible to the DoD and the Nation to provide capabilities to ". . . defend the United States against air and space attack . . . and to establish local air and space superiority . . .." These mission critical roles and missions are based on specialized competencies within the USAF and are fully consistent with U.S. Space Policy and DoD Directive 5100.1.

The Air Force will fulfill its responsibility to the Nation by developing, operating and sustaining a space architecture that will preserve space capabilities with increased space protection; as well as the ability to augment and restore critical military space missions when needed.

Air Force Space Command (AFSPC) is well positioned as the DoD principal force provider and integrator to ensure DoD space protection capabilities. In this role, AFSPC partners with all Services, DoD agencies and U.S. Government organizations. Established DoD processes will be used to plan, program and budget required activities.

Mr. EVERETT. What metrics currently exist to identify and track military space personnel and their experience? Do you know if an officer with a space technical or operations background is filling a space technical or operations billet? Please provide any statistics in this area to the subcommittee.

General CHILTON. In my role as the Space Professional Functional Authority (SPFA), I am responsible for the health of the Air Force Space Professional Community. We established an SPFA Advisory Council to assist in this effort by providing recommendations and guidance on policy directly impacting personnel development. During a recent meeting, the Advisory Council gave preliminary approval to a number of metrics designed to track the health of the Space Professional Community and the effectiveness of the Air Force Space Professional Development Program (SPDP).

The Space Professional Management Office (SPMO) documents and tracks education, training and experience qualifications for each Air Force Space Professional in the Space Professional Development Database. The SPMO also tracks education, training and experience requirements for each space manpower billet in the Air Force. The education, training and experience criteria equate to one of three SPDP Certification Levels, which are also tracked in the database. Experience is documented using Space Professional Experience Codes (SPEC), ten alphanumeric codes that provide details on the type and amount of experience each individual possesses or each space billet requires. This data forms the baseline for a series of metrics.

Yes, we do have the capability to know if an officer with a space technical or operations background is filling a space technical or operations billet. A broad set of metrics compares the inventory of Space Professionals versus space manpower requirements—comparing "supply" (people) and "demand" (position requirements). These metrics can be focused on particular areas, depending on the type of assessment, i.e., Air Force Specialty Code (AFSC), SPDP Certification Level, and SPECs. For example, a metric can be used to assess the inventory of space operations (AFSC 13S) officers, at a particular SPDP Certification Level, with specific SPEC experience versus Air Force position requirements in the same categories. These metrics allow the SPMO to assess the adequacy of the personnel inventory to meet mission requirements—current and future. The metrics are also used in a variety of data analysis applications.

Another metric compares individual skills versus position requirements for key leadership positions: wing, group and squadron commander. These metrics, expressed as a percentage, illustrate the number of key leaders who possess all the requirements for the position they occupy. A notional example: the commander of the 2nd Space Operations Squadron (2 SOPS) would be required to have (1) operations and (2) acquisition experience in the Satellite Operations SPEC, as well as specific experience in (3) Precision Navigation and Timing. Given these requirements, an individual selected for the 2 SOPS command position who does not have acquisition experience would meet 66% of the requirements. This metric confirms the right people are being assigned to the right jobs, enables inventory assessment to ensure an adequate pool of candidates for the 2 SOPS commander position, and validates position requirements.

Metrics focused on space education, a key element of SPDD, provide feedback on the ability to meet requirements in this arena. One metric measures the ability of the National Security Space Institute (NSSI) to fulfill space professional education requirements (e.g., Space 200—required for mid-grade Space Professionals) by comparing NSSI student capacity, annual student requirements and the number of students who completed the course during that year. Additional metrics track the num-

ber of available Space Professionals who possess specific educational credentials, e.g., space academic certificates, master's degrees and NSSI Advanced Courses versus billet educational requirements.

We assess whether an officer with a space technical or operations background is filling a space technical or operations billet is done, as discussed above, by comparing the individual officer's qualifications documented in the Space Professional Development Database against the requirements for the technical/operations billet.

In addition to the metrics reviewed by General Chilton and the Advisory Council, the SPMO routinely develops data on various characteristics of the Space Professional Community that provide insights into mission capabilities. Examples are provided below.

Notes:
1. A–J denotes Mission code
A: Satellite systems, B: Nuclear, C: Spacelift, D: Warning, E: Space Control, F: Intelligence, Surveillance and Reconnaissance, G: Kinetic Effects, H: Space Warning C2, I: Space Test, Evaluation, Education and Training, J: Space Staff
2. Air Force Specialty Code (AFSC)
13S: Space Operations (officer)
61S: Scientist
62E: Engineer
63A: Program Manager
1C6: Space Operations (enlisted)

**Officer Billets by SPEC/Rank**

| | A | B | C | D | E | F | G | H | I | J | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **LT** | 140 | 322 | 49 | 24 | 35 | 43 | 4 | 3 | 7 | 74 | 701 |
| **CPT** | 418 | 561 | 231 | 185 | 183 | 327 | 12 | 118 | 168 | 233 | 2436 |
| **MAJ** | 231 | 209 | 116 | 166 | 136 | 318 | 53 | 183 | 174 | 385 | 1971 |
| **LTC** | 128 | 107 | 77 | 84 | 77 | 234 | 56 | 61 | 93 | 261 | 1178 |
| **COL** | 26 | 33 | 32 | 19 | 14 | 50 | 14 | 16 | 14 | 86 | 304 |
| **GEN** | 1 | 4 | 1 | 0 | 1 | 3 | 4 | 2 | 0 | 18 | 34 |
| | 944 | 1236 | 506 | 478 | 446 | 975 | 143 | 383 | 456 | 1057 | **6624** |

**Officer Billets by AFSC**

| **Officer** | **13S** | **61S** | **62E** | **63A** | **Other** | Total |
|---|---|---|---|---|---|---|
| **LT** | 446 | 22 | 125 | 89 | 19 | 701 |
| **CPT** | 1300 | 97 | 527 | 332 | 180 | 2436 |
| **MAJ** | 1040 | 59 | 347 | 306 | 219 | 1971 |
| **LTC** | 507 | 36 | 182 | 278 | 175 | 1178 |
| **COL** | 84 | 3 | 17 | 53 | 147 | 304 |
| **GEN** | 0 | 0 | 0 | 0 | 34 | 34 |
| | 3377 | 217 | 1198 | 1058 | 774 | **6624** |

**SPEC vs. Experience (in years)**

| | A | B | C | D | E | F | G | H | I | I | J |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Any** | 2782 | 3360 | 1427 | 1650 | 1550 | 1395 | 476 | 860 | 3807 | 970 | 2342 |
| **>3** | 1463 | 2405 | 626 | 628 | 638 | 718 | 162 | 318 | 434 | 256 | 670 |
| **>6** | 211 | 724 | 86 | 137 | 156 | 223 | 21 | 24 | 52 | 23 | 107 |
| **>9** | 20 | 249 | 23 | 35 | 44 | 63 | 2 | 1 | 9 | 2 | 21 |
| **>15** | 0 | 31 | 1 | 2 | 4 | 5 | 0 | 0 | 1 | 0 | 1 |

**Officer Billets by AFSC**

| **Officer** | | |
|---|---|---|
| | **13S** | 3377 |
| | **61S** | 217 |
| | **62E** | 1198 |
| | **63A** | 1058 |
| | **Other** | 774<br>6624 |

**Officer/Enlisted Space Pros by AFSC**

| | | | |
|---|---|---|---|
| **Officer** | | | |
| | **13S** | 3413 | |
| | **61S** | 363 | |
| | **62E** | 1686 | |
| | **63A** | 1186 | |
| | **Other** | 460 | 7108 |
| **Enlisted** | | | |
| | **1C6** | 896 | |
| | **Other** | 385 | 1281 |
| | | | **8389** |

Mr. EVERETT. With respect to the newer space acquisition programs like TSAT, Space Radar, and GPS–III, what specific criteria will be used (e.g., technology readiness levels, affordability), and at what point in the acquisition cycle, to determine whether these programs should continue to move forward or an alternative solution pursued? Similarly, what criteria are used to determine whether existing programs should be continued or a new approach pursued?

Dr. SEGA. National Security Space (NSS) Acquisition Policy 03–01 provides acquisition process guidance for the combined space activities of the DoD and National Intelligence Community (IC). National Reconnaissance Office (NRO) Directive 7 describes a similar acquisition process for the IC portion of the NSS team.

The NSS Acquisition Process is a streamlined, tailored method for the DoD Space Milestone Decision Authority (MDA) to use in the executive management and oversight of the DoD space programs under his authority. The process includes unam-

biguous acquisition phases, decision points based on program maturity with focused program assessments, and periodic reports and reviews. Key Decision Points (KDPs) are points in the acquisition timeline of a DoD Space program expressly used to address the questions you have raised. The DoD Space MDA convenes a Defense Space Acquisition Board (DSAB) for each KDP to obtain advice and information necessary to do a thorough evaluation of the program. Each DSAB reviews areas to revalidate warfighter requirements and mission need, the DoD and/or other appropriate components support for the program, assess the program life cycle financial requirements, and ultimately determine if the program should continue into the next phase, be redirected, or terminated. The standard required to begin development is that critical technologies be demonstrated in a relevant environment. The TSAT, Space Radar, and GPS III programs are all implementing significant Phase A system engineering activities and technology maturation plans to inform their planned KDP–B milestones. In preparation for these milestones each of these programs will undergo rigorous assessments in regard to technology readiness, affordability and a myriad of other factors. This will include an independent assessment of cost to understand affordability and a technology maturity assessment to understand technology readiness. These assessments must provide sufficient knowledge to the appropriate milestone decision authorities so that an informed decision can be made as to the future plans of these acquisitions to include alternative approaches if needed.

Mr. EVERETT. What specific space surveillance commercial/foreign entity (CFE) services are funded in the Fiscal Year 2008 request and what are the Air Force's plans for implementing the CFE program on an ongoing basis? Are the resources available to enable both the completion of the pilot program and its full implementation thereafter?

Dr. SEGA and General CHILTON. The existing CFE Pilot Program (also known as the spacetrack.org website) which provides basic information on unclassified cataloged space objects is not funded in the Fiscal Year 2008 request; however, AFSPC's intent is to allocate available funding from other requirements in the Space Situational Awareness program to maintain the program at its current level of service.

AFSPC plans to evolve the existing CFE pilot program from a basic website to an improved operational capability that provides advanced services (conjunction assessment, launch screening, anomaly resolution, etc.) to a wide variety of customers to include Commercial, Allied, Public and Foreign Interests.

No resources are available within the budget for full implementation of the program. Although we support the Presidents Budget, the 2008 unfunded priority list includes a request for funds to improve reliability and operationalize the existing CFE Pilot Program.

Mr. EVERETT. Please describe your view on the current state of "black and white" space integration and what should be done in this area in the future. Consider the areas of organization and management, S&T, acquisition, operations and personnel, at a minimum.

Dr. KERR. I do not look at "black and white" space integration as an end in itself, because space is the place from which we perform our mission; but it is not our mission.

It is critical, however, that the Air Force and the NRO (as well as other U.S. organizations with space programs) continually examine what we need to meet our mission requirements and that we work closely to align and coordinate programs and capabilities whenever the result will be a more efficient and effective capability for our Nation. Below are several examples where the NRO has worked closely with others with the result that we all have stronger space programs.

- The NRO and Air Force reaffirmed our strong relationship on 7 June 2006, with a joint Statement of Intent, signed by Gen. Mosley and myself. This agreement bolstered the ties and reaffirms collaborative approaches between the Secretary of Defense and the Director of National Intelligence. The NRO's workforce, composed of approximately 50% Air Force personnel and more than 40% CIA employees, serves as the ultimate exemplar for joint and integrated activities. The NRO and our partner agencies have cooperated to advance the nation's space interests in several areas: EELV, Space Radar, the Space Partnership Council, and STRATCOM's Joint Forces Component Commander for Space (JFCC-Space).
- One key acquisition and operational example involves the Evolved Expendable Launch Vehicle (EELV) agreement between the Air Force (as DoD's executive agent for launch) and the NRO. EELV is a true partnership—there is a 30/70 split between the NRO and Air Force on all launch costs. The NRO and the Air Force use the same launch bases and range support assets. The

Air Force's Space and Missile Systems Center (SMC) provides booster verification process and the NRO funds 50% of SMC launch related Aerospace Corp technical expertise. Additionally, NRO communications teams support all EELV missions (NRO, Air Force and commercial launches). This partnership helps ensure mission success through unfettered sharing of EELV performance data.

- The Space Radar program stands out as a future operational system where the NRO and Air Force have devised an integrated effort to achieve persistent surveillance capabilities for the nation. The Program Executive Officer, Air Force Major General Torn Sheridan, who also serves as NRO Deputy Director, and his NRO/CIA Deputy Program Executive Officer are following Intelligence Community and DoD guidance to jointly produce spacecraft and develop ground infrastructure to operate Space Radar with funds now consolidated into the military and national intelligence budget. Managing the SR Program within the NRO MIP portfolio also strengthens efforts to integrate SR budgets and efforts into the classified NGA and NRO ground architectures to ensure an end-to-end capability is developed.
- More recently, the NRO intensified cooperative efforts with our mission partners regarding Space Situational Awareness. The NRO and STRATCOM exchanged senior leaders to support the JFCC-Space, BGEN Jeff Horne, the NRO's Deputy Director for Mission Support is dual-hatted as the Deputy JFCC-Space. Finally, tighter integration has been achieved by the initiation of backup command and control capabilities between STRATCOM's Joint Space Operations Center (JSpOC) and the NRO's Operations Center (NROC).

Mr. EVERETT. What specific organization and management mechanisms are in place to address "black and white" space integration issues? What forum(s) exist for decision-making on issues across "black and white" space?

Dr. KERR. As mentioned earlier, the NRO works closely with others to ensure that we are developing systems and capabilities that best meet the needs of our nations. This goes well beyond the NRO and the Air Force, to include many other parties.

- The NRO is a member of the Space Partnership Council. This council provides coordination between Air Force Space Command, USSTRATCOM, the NRO, NASA and DARPA. The council considers broad issues, including science and technology development, involving the nation's space programs and allows senior leadership to responsively address issues that impact the nation's space program as a whole. This council meets twice a year, April and December.
- NRO/AS&T meets regularly with other research and development organizations, such as DARPA, National Labs and others, to collaborate on new technologies and to support each other in our mutual research.
- The NRO participates in the NASA/NRO working group to answer questions of shared architecture and resources,

Mr. EVERETT. Who or what organization or management construct is responsible for overseeing the protection/defense of U.S. space assets? What processes are in place to address and enforce space protection within individual space acquisition programs and across the enterprise?

Dr. KERR. The Intelligence Community and Department of Defense have traditionally supported one another in the analysis and mitigation of threats to our space systems. Primarily, STRATCOM, in their role as JFCC-Space, is responsible for the defense of our space assets. As previously stated, the NRO's Operations Center (NROC) and the 14th AF's Joint Space Operations Center (JSpOC) jointly provide Space Situational Awareness data to the space community to ensure we collectively have the most current threat data.

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## QUESTIONS SUBMITTED BY MR. BARTLETT

Mr. BARTLETT. What percent would you say of our total military communications moves over EMP-hardened satellites?

General CHILTON. In total, approximately 85% of our military-owned SATCOM capacity is EMP-hardened. Of DoD-owned SATCOM systems on orbit (UHF Follow-On [UFO], the Defense Satellite Communications System, and Milstar), only UFO

satellites were not intended to operate in an EMP environment. None of the commercial capacity we lease is EMP hardened. Adding commercial SATCOM to our total communication capacity reduces the percent of the EMP-hardened SATCOM for military use to 13–14 percent.

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