S. HRG. 110–201, PT. 7

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2008

HEARINGS

BEFORE THE

COMMITTEE ON ARMED SERVICES
UNITED STATES SENATE

ONE HUNDRED TENTH CONGRESS

FIRST SESSION

ON

S. 1547

TO AUTHORIZE APPROPRIATIONS FOR FISCAL YEAR 2008 FOR MILITARY ACTIVITIES OF THE DEPARTMENT OF DEFENSE, FOR MILITARY CONSTRUCTION, AND FOR DEFENSE ACTIVITIES OF THE DEPARTMENT OF ENERGY, TO PRESCRIBE PERSONNEL STRENGTHS FOR SUCH FISCAL YEAR FOR THE ARMED FORCES, AND FOR OTHER PURPOSES

PART 7
STRATEGIC FORCES

MARCH 28; APRIL 11, 19; MAY 2, 2007

Printed for the use of the Committee on Armed Services

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2008—Part 7
STRATEGIC FORCES

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DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2008

WEDNESDAY, MARCH 28, 2007

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

STRATEGIC FORCES PROGRAMS

The subcommittee met, pursuant to notice, at 9:37 a.m. in room SR–232A, Russell Senate Office Building, Senator Bill Nelson (chairman of the subcommittee) presiding.

Committee members present: Senators Bill Nelson, Reed, E. Benjamin Nelson, Sessions, and Thune.

Majority staff members present: Madelyn R. Creedon, counsel; Richard W. Fieldhouse, professional staff member; Creighton Greene, professional staff member; and Thomas K. McConnell, professional staff member.

Minority staff members present: Michael V. Kostiw, Republican staff director; Gregory T. Kiley, professional staff member; Jill L. Simodejka, research assistant; Robert M. Soofer, professional staff member; and Kristina L. Svinicki, professional staff member.

Staff assistants present: Kevin A. Cronin and Jessica L. Kingston.

Committee members' assistants present: Christopher Caple, assistant to Senator Bill Nelson; Eric Pierce, assistant to Senator Ben Nelson; and M. Bradford Foley, assistant to Senator Pryor.

OPENING STATEMENT OF SENATOR BILL NELSON, CHAIRMAN

Senator BILL NELSON. Good morning, everybody. The group in the back is a school from Cape Coral, FL, who I have just visited with. I have invited them for the few minutes that they have to come in and see what this is like up here in Washington, DC. We are going to be getting into some pretty heavy stuff this morning. You students, I want you to know that we have—look at all the stars on his shoulders. This is General Cartwright and he is the head of the Strategic Command and he is going to be the first witness. He is going to present an overview of the Strategic Command and the challenges that it faces.

Then on the second panel we are going to discuss various strategic programs. We are going to hear from Tom D'Agostino, Acting Deputy Administrator of the National Nuclear Security Adminis-

tration (NNSA), and Major General Burg, Director of Strategic Security in the Air, Space, and Information Operations. We are going to hear from Rear Admiral Johnson, Director of the Strategic Systems Programs in the Navy, and Brian Green, Deputy Assistant Secretary of Defense for Strategic Capabilities.

Our hearing is going to be complicated because they are going to call a vote at 11 o'clock. So we are going to just go as much as we can and then we will have to adjourn and go vote.

We want to have a discussion today about the Reliable Replacement Warhead (RRW), bombers, land-based Intercontinental Ballistic Missiles (ICBMs), prompt global strike, and future nuclear weapons stockpiles. All of the witnesses have submitted written testimony and so what we want to do is have a conversation. The written testimony will be entered in the record and made a part of the record, and so we want to have a conversation interspersed by lots of questions.

[The prepared statement of Senator Bill Nelson follows:]

PREPARED STATEMENT BY SENATOR BILL NELSON

Good morning. Welcome General Cartwright. It is a pleasure to have you with us on the first panel of our strategic programs hearing. We will have two panels today. During the first panel we will hear from General James Cartwright, the Commander of the Strategic Command. General Cartwright will present an overview of the Strategic Command and the challenges that it faces.

The witnesses on the second panel will discuss the various strategic programs under the subcommittee's jurisdiction. On the second panel, we will hear from Tom D'Agostino, the Acting Deputy Administrator of the National Nuclear Security Administration (NNSA); Lieutenant General Carrol Chandler, Deputy Chief of Staff, Air Force Operations, Plans and Requirements; Rear Admiral Stephen Johnson, Director Strategic Systems Programs, Naval Sea Systems Command; and Brian Green, Deputy Assistant Secretary of Defense for Strategic Capabilities in the Office of the Under Secretary of Defense for Policy.

In the event that it is necessary, we have made provision for a closed session following the second panel, in room SR–222.

We look forward to a good discussion today on a wide range of topics including the Reliable Replacement Warhead, bomber aircraft, particularly the B–52, the land-based ICBMs, prompt global strike, and the future nuclear weapons complex.

All of you who have submitted written statements, these statements will be included in the record. Also, we will keep the record open for 3 days for members to submit questions for the record. We would appreciate it if each witness could promptly answer these questions. Thank you.

Again, welcome.

Senator BILL NELSON. Senator Sessions.

STATEMENT OF SENATOR JEFF SESSIONS

Senator SESSIONS. Thank you, Mr. Chairman. I enjoyed our time on this committee together when I was fortunate to be chairman. You were a tremendous ranking member who contributed so much and I enjoy working with you a great deal, and I look forward to trying to be as helpful to you as you have been to me.

This hearing is an opportunity to stress the progress our Nation has made toward adapting our strategic forces and deterrence doctrine to a new security environment characterized by unpredictable threats posed by terrorist groups and rogue nations armed with weapons of mass destruction (WMD). While much of the public debate on strategic forces seems to focus on the role of nuclear weapons and the size of our nuclear arsenal, I believe we need to look also at the broader question of whether our Nation is acquiring all

the types of strategic forces necessary to deal with today's new and various threats.

The 2001 Nuclear Posture Review (NPR) called on the United States to reduce reliance on nuclear weapons while placing greater emphasis on advanced conventional weapons and defenses to deter and defend against new threats to our security. Consistent with this, President Bush announced in 2001 that the United States is "committed to achieving a credible deterrent with the lowest possible number of nuclear weapons consistent with our national security needs, including our obligations to our allies."

Under the NPR framework, we have begun the drawdown of our nuclear forces to what will be in 2012 the lowest level since the dawn of the nuclear age and have begun to provide limited protection for our Nation and forces against ballistic missiles of all ranges.

So if we agree as a Nation, as I believe we do, that we will continue to rely on some number of nuclear weapons for our strategic posture, then we must also examine seriously the need to make sure those weapons are safe and reliable.

Finally, if we are truly committed to reducing our nuclear weapons then we must reach agreement on prompt long-range conventional strike weapons capable of thwarting the most dangerous threats to our security.

I will ask, Mr. Chairman, that the balance of my remarks be made a part of the record and I look forward to hearing from our witnesses.

[The prepared statement of Senator Sessions follows:]

PREPARED STATEMENT BY SENATOR JEFF SESSIONS

We meet today to receive testimony from two panels on strategic forces programs in review of the National Defense Authorization Request for Fiscal Year 2008 and the Future Years Defense Program. For the first panel, we welcome General James Cartwright, who as Commander of U.S. Strategic Command, is responsible for tailoring U.S. strategic forces and policy to the new, post Cold War security environment. The second panel will provide an opportunity to delve more deeply into the various service plans and programs for strategic forces as well as examine plans for revitalizing our nuclear infrastructure. Witnesses on the second panel include: Major General Roger Burg, USAF; Rear Admiral Stephen Johnson, USN; the Honorable Thomas D'Agostino, Acting Administrator of the National Nuclear Security Administration; and Brian Green, Deputy Assistant Secretary of Defense for Strategic Capabilities.

This hearing is an opportunity to assess the progress our Nation has made toward adapting our strategic forces and deterrence doctrine to a new security environment characterized by unpredictable and perhaps undeterrable threats posed by terrorist groups and rogue nations. While much of the public debate thus far seems to focus on the role of nuclear weapons and the size of our nuclear arsenal, I believe the focus should be on whether our Nation is building the types of strategic forces necessary to deal with today's new threats.

The 2001 Nuclear Posture Review (NPR) established a conceptual framework for thinking about deterrence in this new strategic age, and serves as a useful guide for understanding the relationship between offensive and defensive strategic forces, as well as the relationship between nuclear and conventional weapons—all of which must play a role in deterring strategic attacks against the United States, its forces, and its friends and allies.

The NPR calls on the United States to reduce reliance on nuclear weapons while placing greater emphasis on advanced conventional weapons and defenses to deter and defend against new threats to our security. Consistent with this reduced reliance on nuclear weapons, President Bush announced in 2001 that the United States is "committed to achieving a credible deterrent with the lowest possible number of

nuclear weapons consistent with our national security needs, including our obligations to our allies."

How well have we done in drawing down our nuclear forces while simultaneously improving our conventional strike capabilities, fielding missile defenses, and securing a responsive nuclear infrastructure that hedges against future changes? That, I believe, is the central question before us. My initial assessment is mixed.

With respect to the nuclear drawdown, we appear to be well on the way toward meeting our commitment under the Moscow Treaty to reduce operationally-deployed warheads to between 1,700 and 2,200, which will be the lowest level of nuclear weapons deployed by the United States since the Eisenhower administration. By the end of 2007, we will meet an interim reduction milestone of 3,800 deployed warheads. In addition, the U.S. has decommissioned all 50 Peacekeeper ICBMs, and has removed 4 ballistic missile submarines from strategic service—a further reduction of 96 missile launchers from the strategic force. The United States has permanently denuclearized the B–1 bomber force and the administration recommends a reduction in the size of the B–52 force from 94 aircraft to 56, a reduction in the Minuteman ICBM force from 500 to 450, and the retirement of 460 nuclear armed Advanced Cruise Missiles.

While the nuclear-drawdown appears to be proceeding in good order, the same cannot be said about the fielding of the advanced conventional strike capabilities necessary to reduce reliance on nuclear strike forces. The Department of Defense has made progress in developing and fielding short-range precision guided conventional munitions, but such forces may not be in position to interdict fleeting targets, such as mobile ballistic missile launchers or high-value terrorist targets, that could inflict strategic blows against the United States and its interests. We lack today the capability to deliver prompt, conventional strikes against these targets at extremely long ranges. The development of this capability, sometimes referred to as "prompt global strike," has lagged due to a lack of consensus between Congress and the administration on how best to proceed. I plan to make it a priority this year to find a path that will permit the Department of Defense to develop and field this important new strategic capability before the end of the decade.

Perhaps the most impressive change in our strategic posture since the NPR lies in the area of missile defense. In 2001, we could count only upon our Patriot batteries to provide limited missile defense protection against short range ballistic missiles. Today, we have over a dozen ground-based interceptors deployed for the defense of the United States against long-range North Korean ballistic missiles; a similar number of SM–3 missiles are available for deployment on some seven Aegis BMD ships to defend against short- to medium-range ballistic missiles; and the Army deploys hundreds of improved Patriot PAC–3 missiles to defend our forces against short-range threats. Supporting these interceptors is a global system of upgraded early warning and tracking radars and the command and control system necessary to link together these multiple sensors and interceptors. In just a few short years, our missile defense capabilities have moved from purely research and development to operational fielding, such that we were prepared to defend our Nation and our regional allies should it have been necessary during the July 2006 North Korean ballistic missile tests.

The NPR also called for a threat and capabilities-based approach in the area of nuclear weapons. Specifically, the NPR called for a transition from a nuclear stockpile with large numbers of deployed warheads to a smaller stockpile augmented with a responsive infrastructure which would be capable of responding to emerging threats and to changes in the global security environment. This smaller stockpile eventually was targeted at 1,700 to 2,200 weapons by 2012. It is important to remember, however, that the development of a responsive infrastructure was intended to be an essential precursor to these reductions, to provide the confidence that pursuing these reductions would not harm our security posture, no matter what possible futures lay ahead.

The subcommittee is interested to learn what progress is being made in developing this responsive infrastructure over the past 5 years, since the NPR. When I became the chairman of this subcommittee 2 years ago, a "responsive infrastructure" was defined in terms of meeting key performance metrics for the Department of Defense, such as the ability to design, develop, and field new capabilities within a certain number of months, or to resolve technical issues regarding the stockpile in a timely manner. I would note that the most recent "Stockpile Stewardship Plan Overview" (November 2006) includes guidelines for responsive infrastructure such as the following: "support the current stockpile"; "execute the Reliable Replacement Warhead program"; and "provide opportunities for a smaller stockpile."

While I don't criticize the desirability of these "guidelines," I believe that we need to continue to drive improvements in the execution of the nuclear weapons program

through a set of measurable performance goals—agreed upon between the Secretaries of Energy and Defense. The program should also have defined goals for budget and schedule performance. It has been 5 years since the NPR called for a responsive infrastructure. Only in the past year did the Department of Energy embark upon an analysis of alternatives for what is now called "complex transformation". I hope to explore why it has taken 5 years to get to this point; what performance objectives are we laying out in order to judge the various alternatives; and, what cost objectives might be appropriate in order to make this nuclear enterprise run more like a business.

I conclude by welcoming the call by many of my colleagues in Congress for a debate concerning the future role of nuclear weapons. But I would also remind my colleagues, and the public, that for over 5 years now, we have been operating under a new strategic framework that seeks to adapt our strategic capabilities and deterrence doctrine to address the most pressing new threats of our time: terrorists and rogue nations armed with weapons of mass destruction. Under that framework, we have begun the drawdown of our nuclear forces to the lowest levels since the dawn of the nuclear age, and have begun to provide limited protection for our Nation and forces against ballistic missiles of all ranges. If we agree as a Nation—as I believe we do—that we will continue to rely on some number of nuclear weapons for our security, then we must also examine seriously the need to make sure those weapons are safe and reliable. Finally, if we are truly committed to reducing our reliance on nuclear weapons, then we must reach agreement on alternative long-range conventional strike weapons capable of thwarting the most dangerous threats to our security.

Senator BILL NELSON. General Cartwright, now we are going to treat this as a conversation, so you just start off, but we are going to interrupt and ask questions. Thank you for your service to our country. Thank you for the leadership that you are giving. You are doing an outstanding job and that is well-noticed and we appreciate that.

Senator SESSIONS. I agree.

STATEMENT OF GEN. JAMES E. CARTWRIGHT, USMC, COMMANDER, U.S. STRATEGIC COMMAND

General CARTWRIGHT. Mr. Chairman, I would like to make this a conversation. I will just take a very few minutes at the front end to set the context for the conversation, but there is no way that my remarks will cover all the mission space, and I would rather have you take me where you want to go and then we can discuss it.

But at the front end, as Senator Sessions alluded to in his remarks, the change in the strategy to acknowledge the fact that the threat has proliferated, that it is a very different character than what we faced in the Cold War, and that it is advantaged by the information age. The access to technology, the access to information, has proliferated. We are dealing with nation states that we can consider peers, we are dealing with what has been termed rogue nation states. We have extremist groups and we have terrorists.

When you look across that spread of threat, we have to have a different strategy to deter that wide range of threat. The intent was to build a tailored strategy, to have a balance between offense and defense that would allow regional combatant commanders the flexibility to apply the appropriate deterrence in a credible way to each of the nations in their area, each of the threats and challenges that they face.

As was stated by Senator Sessions, in the 2001–2002 timeframe we entered into an agreement with the Russians to start to drastically reduce our nuclear stockpile and to start to move away from

mutual assured destruction as the singular strategy that we were pursuing. 2007 is the halfway point for both us and the Russians. There were goals set for the halfway point. We have compared notes. We are both on track, ahead of schedule, and moving towards that 2012 target.

Part of what 2007 was to do for the United States was to review the emergence of the other capabilities that would replace mutual assured destruction in the nuclear stockpile as we understood it. The key is understanding that our intent is to move to the smallest number of nuclear weapons necessary to ensure national security.

The emergence of missile defense over the past year, particularly in light of the testing that occurred from North Korea on the 4th of July, has lent to ballistic missile defense a credibility and a capability that has been demonstrated now, that is having an effect globally. We are starting to be able to devalue things like short, medium-range and ICBMs in a way that we were not able to do in the past. You can see that in the embracing that is going on with our Japanese partners, with our South Korean partners in that theater, the things that are happening in Europe and the Middle East, and the partnerships that are beginning to develop around this collective defense capability against what is emerging as a key threat, which are the ballistic missiles.

So to me that piece has started to mature at a rate that is commensurate with the drawdown of the nuclear weapons that we have experienced between 2001 and 2007.

In addition, we talked about offensive capabilities. On the general purpose force side of the equation, the emergence of the J-coded weapons, the global positioning system (GPS)-guided gravity bombs, the new cruise missiles that have been fielded both from the Navy and from the Air Force, air and sea, have given us a capability that we did not have before. It has changed how we are using the force. Regional combatant commanders are today using bombers to do close air support, and do it credibly, in a way that we never would have imagined that those vehicles could be used, lending a new value to their capability.

Many of the targets that we have held at risk with only nuclear weapons in the past we can now credibly hold at risk with conventional weapons. The one piece that is still an outlier for us and a challenge is prompt global strike weapons. The alternative conventional capability when nuclear is inappropriate or we have at least a choice between nuclear and conventional alternatives, and we can talk more about that.

Senator BILL NELSON. General, go back on that statement just before. Give me an example of what can you do now with a conventional weapon that you used to have to do with a nuclear weapon?

General CARTWRIGHT. We used cruise missile-delivered nuclear weapons to hold at risk integrated air defenses targets/weapons. We really do not need to do that with nuclear weapons any more. The conventional cruise missiles that we have are survivable, they are precise. They can address these targets. So we have been able to offload some of those targets, and that has allowed us to stay on track in the reduction of operationally-deployed nuclear weapons.

Senator BILL NELSON. Give us an example of those targets.

General CARTWRIGHT. Integrated air defenses? In the case of Russia, they have those along the coastlines. They are used to defend the country against penetrating bombers or other airborne type targets. Other countries have the same capabilities, whether they be large countries like China or the rogues like North Korea or Iran.

So integrated air defenses have now a conventional way we would go at them, that renders the use of a nuclear weapon against that target as possible, but we have a choice. It may be that you do not want to use a nuclear weapon in that case. It may be proximity to a border of a friendly nation. It could be just the inappropriateness, of wanting to control escalation driving it down rather than up. Any of those are reasons why a conventional warhead may be preferred in the strategy over a nuclear warhead.

Senator BILL NELSON. You were starting with the RRW.

General CARTWRIGHT. RRW. For us the nuclear strategy is not zero today. It is the least number necessary to ensure national security. If we are to have these weapons, the attributes that I would like to have on those weapons is that they be the safest they can be for the people who must handle them, both in the Department of Defense (DOD) and in the manufacturing of these weapons—the maintenance and upgrades, reviews, life cycle type activities.

You also want to ensure that they are the most secure that they can be. In the 1950s, 1960s, and 1970s, we put these weapons together without the technologies that we have today for safety and security. We have learned a lot. We use this example of the 1966 Mustang. Sure, I would like to have it, but I am not sure I want to give it to my teenager or grandson without disc brakes, seat belts, air bags, et cetera.

We have the technologies today readily available to make these safe and secure. The third attribute that we generally talk about in the RRW is reliability. The more reliable, the lower the number against any given target that we have to send to that target, number of times we have to revisit that target with either a manned or an unmanned presence. That helps us draw that stockpile down.

But I think the fourth piece here that is often missed is that the RRW offers the opportunity to completely change the way we manage operational and technical risk. By having this warhead, we have the opportunity to move into the manufacturing processes that we have today versus the ones that we had in the 1960s. In the 1960s we managed operational and technical surprise with inventory. We built more and more different kinds in order to ensure that if we needed it and we found a genetic flaw or something started to appear as a misoperating part in the complex, that we would just substitute another class of warhead.

That led us to very large numbers of weapons in the active stockpile, but also, not addressed in the treaty, in the inactive stockpile. RRW allows us to move to component commonality, not to manage end items, but to manage it at the component level. We introduce technologies and diversity into the stockpile that allows us to drastically reduce the number of operationally deployed and inactive warheads. That probably will be the single greatest factor in reducing the number of these weapons that we have in our inventory.

That attribute in and of itself is something worthy to consider for the committee.

Senator SESSIONS. What was the first point you made on reliable?

General CARTWRIGHT. Safe. We want to introduce those types of attributes, particularly in the package itself.

Senator SESSIONS. I was thinking there was something before that.

General CARTWRIGHT. Particularly in the package itself, using components that are safe to handle and if they are intruded upon are safe. The Navy has moved to this type of activity over the years. The Air Force is moving. Why not introduce it into the whole stockpile? We have ways of making these explosives safe.

Senator BILL NELSON. By the way, I want to mention to you and Ben, we are going to try to put together a committee trip to the three labs. A good time for me is right after the 4th of July, when we are still in that break, July the 5th; go to Lawrence Livermore and then to Sandia and then to Los Alamos, where then we will get briefed on specifically what the General is talking about and where you can see it for yourself.

Tell us, General, now, you have made a good case. Why are the Russians not going to think what we are doing is building more and powerful and therefore lessen their incentive to reduce?

General CARTWRIGHT. One, we have publicly made the information available so that they can see what we are doing, and I have talks military-to-military to reinforce that activity. Two, we are not changing any of the delivery vehicles. We call this form-fit-function. It has to go into the same slot that it came out of, talking to the RRW. No new delivery vehicles, actually a great reduction in the number of delivery vehicles necessary for the stockpile.

That has been relatively transparent. Too, we are really trying to follow the lowest risk pathway here. So one of the prerequisites is that we will do this without testing. So what we are doing has a legacy in the former test program, but it also has the characteristics in volume. The laws of physics are going to stay relatively constant for us. They understand the volumes we are dealing with, they understand the delivery vehicles. This is all stuff that we have verified in treaties in the past. They have a good understanding and we have a good understanding of each other's capabilities.

I do not think that the issue of whether or not the physics package is distinctly different, is a wide variation on what we did, has really been an issue. We have made that transparent. We have done it both openly in the exchanges and privately in our military-to-military discussions.

Senator SESSIONS. They are modernizing theirs already, regardless of what we do; is that not correct?

General CARTWRIGHT. Yes, sir. They are more focused on the delivery platforms and how they are modernizing their delivery platforms. But they are working on their weapons.

Senator SESSIONS. On the question of the NPR, it talked about responsiveness, responsive nuclear infrastructure. What does that mean, that we want to have a responsive nuclear infrastructure, and how does that affect what you are doing?

General CARTWRIGHT. For me there are a couple of components here. We talked about modularity so that the infrastructure can produce just what it is as a module rather than an entire end item to solve the problem. That is point one. Point two is that it is an infrastructure—we learned this with the J-coded weapons on the conventional side, including artillery shells. If we could get to precision, if we could start to build these with a warm production line rather than building 100,000 of them, shutting down the factory, sending everybody home, then when it was time to build the next generation discarding all that we had and starting all over again with an infrastructure that was not warm, we had lost the intellectual capital and the manufacturing capabilities to do that.

So what we are looking for is a warm industrial capability, one that takes advantage of the best practices in the civilian sector, one that acknowledges the fact that we are dealing with something that is very dangerous here. But if we keep those people trained and if we keep the production activity responsive, so that we are not doing it with inventory, we are doing it with the manufacturing capability to the best extent possible, then that becomes a responsive infrastructure.

I think if you take the trip one of the first things that you will see is the attitude of the people. If you were there a year or 2 in the past versus what you would see today or in the near future, I think that Tom D'Agostino would tell you and I certainly will tell you as I go visit those labs, the attitude of those people see it and understand how to bring modern technology to their job, the security and the safety that that provides them, the environmental responsibility that is associated with it, you would see a very different attitude in those labs.

[The prepared statement of General Cartwright follows:]

PREPARED STATEMENT BY GEN. JAMES E. CARTWRIGHT, USMC

Mr. Chairman and members of the subcommittee: This is my third opportunity to appear before you as Commander of United States Strategic Command. As such, let me first thank you for the time, attentiveness, and professionalism of your staffs as we have worked through some of the difficult challenges we face. The men and women of Strategic Command have performed superbly over the last year, demonstrating honor and dedication through long hours and deployments. We continued to transform our organization and capabilities over the past year, to better deal with traditional, irregular, catastrophic, and disruptive contingencies. As the national security environment continues to shift, we see other challenges on the horizon. We seek to adapt to the shifting national security environment by refining and fielding a "New Triad" of capabilities. Today I will outline how we intend to address the challenges we face and ask for your assistance.

CONTINUING TRANSFORMATION

When we met a year ago, we talked of progress toward transforming Strategic Command in the midst of conflict. We spoke of new functionally aligned organizations designed to improve our operational speed and progress toward a New Triad of capabilities. Finally, we attached particular importance to the threat posed by non-state actors, the need to tailor deterrence and focus on effects rather than kinetic solutions.

One year later, our functional components for intelligence, surveillance and reconnaissance (ISR), network warfare, global network operations, information operations, integrated missile defense and combating weapons of mass destruction (WMD) are each at or nearing full operational capability. In light of disturbing trends in the space domain, we further refined our components by splitting Joint Functional Component Command—Space and Global Strike into two individual components, focusing on global strike and integration, and space operations. These func-

tional components are also progressing rapidly and producing significantly enhanced operational results. This year the Joint Information Operations Warfare Command completed the stand up of four joint centers to facilitate the planning and execution of Information Operations. The Joint OPSEC Support Center, Joint Mission Support Center, Joint Electronic Warfare Center and Joint Strategic Communications Support Center were established to improve Information Operations throughout the combatant commands. We made progress in restructuring our legacy nuclear deterrent force in compliance with the Moscow Treaty. On the less positive side, we have debated, but made little gain in, filling a gap in our prompt global strike capability.

CONFRONTING TRADITIONAL, IRREGULAR, CATASTROPHIC AND DISRUPTIVE THREATS

The 21st century opened with a violent attack on American soil reminiscent of our experience more than six decades ago at Pearl Harbor. Unlike Pearl Harbor, the attack of 2001 was unique in one important way; military combatants were not involved. Civilians and the image of America were the targets of calculating and fanatical terrorists. Unlike the past, attribution for this attack would not be credited to a single state or alliance of states. Rather, it would be attributed to non-state actors who were empowered by their ability to operate and leverage technology in a flattened world and were not deterred by the military tools with which we deterred others for the last 50 years.

As a world power, America's conventional and nuclear military capabilities remain second-to-none in deterring traditional threats, but our adversaries are predictably positioning themselves to avoid our strengths and exploit our vulnerabilities. Moreover, we live in a world in which traditional nation-states and alliances are asymmetrically challenged by adversaries who are unconstrained by geographic boundaries or internationally shared societal and legal norms.

We are therefore preparing for immediate, potential and unexpected contingencies driven by these diverse adversaries who threaten America and its deployed forces, friends, and allies. These adversaries are pursuing the means for sudden and catastrophic strikes using WMD-armed ballistic missiles, or with little or no warning using WMD delivered by irregular means. They can also execute disruptive attacks in milliseconds using readily available, web-enabled communications and technologies from computers located anywhere on the globe.

SHIFTING NATIONAL SECURITY CHALLENGE

While we continue to focus on the need to deter non-state actors through effects-based operations and remain vigilant with regard to those nations that possess large inventories of nuclear weapons, recent events in Iran, Lebanon, North Korea, and China, if unchecked, foreshadow future critical challenges.

Daily cyberspace intrusions into civil, military, and commercially networked systems; the nuclear aspirations of Iran and North Korea, in open disregard of broad international opinion; the firing of rockets and cruise missiles from Lebanon and Gaza into Israel by Hezbollah and Hamas; the unannounced and irresponsible launch of North Korean missiles in the vicinity of Japan; and China's controversial launch of an anti-satellite missile, which has subsequently endangered routine use of space, demonstrate the range of challenges facing America.

Today, we live in an Information Age where communication through cyberspace has forever changed and flattened our world. Free and open use of cyberspace has become an essential tool of the global economy and connects people throughout the world to each other. In fact, most Americans can no longer imagine a world without instant communications and the freedom to access goods, services, and information at will. However, not unlike the targets of pirates or train robbers of the past, America is under widespread attack in cyberspace. Our freedom to use cyberspace is threatened by the actions of criminals, terrorists, and nations alike. Each seeks their own form of unique advantage, be it financial, political, or military, but together they threaten our freedom to embrace the opportunity offered by a globally connected and flattened world. The magnitude of cost, in terms of real dollars dedicated to defensive measures, lost intellectual capital and fraud cannot be overestimated, making these attacks a matter of great national interest. Unlike the air, land and sea domains, we lack dominance in cyberspace and could grow increasingly vulnerable if we do not fundamentally change how we view this battlespace.

Ballistic missile proliferation is a concern to free nations and will continue to pose a challenge to national security around the world. Introduction of nuclear weapons to the situation, particularly in the hands of regime leaders who openly seek to threaten or coerce their neighbors, presents an untenable threat to U.S. national security interests. It is clear that we must exhaust all possible diplomatic and economic avenues to solve the problem, but in the end, the DOD could be called upon

to deter, reduce, or eliminate a critical threat to the security of America, its forces, friends, and Allies.

America's defense strategy relies upon layers of capability that offer policymakers maximum political-military flexibility. The first layer is our emergent missile defense system. This system, when mature, will not be an impenetrable shield, but it will reduce the likelihood of successful attack. Successful tests have thus far demonstrated our ability to overcome technical challenges and we have gained international credibility, but more work remains as we turn our attention to defense of Europe and regional threats in Southwest Asia. Our second layer of defense is offensive strike—defeat the threat. Policymakers will first seek to employ forward deployed general-purpose forces, normally available in 3–5 days, given sufficient warning and range. Some conventional global strike forces are capable of reducing or eliminating threats within 1–2 days, but if the threat is sudden or fleeting our only existing prompt global strike capability employs nuclear ballistic missile systems. While America possesses dominant conventional capabilities second-to-none, we lack the capability to respond promptly to globally dispersed or fleeting threats without resorting to nuclear weapons. As good as they are, we simply cannot be everywhere with our general-purpose conventional forces and use of a nuclear weapon system in prompt response may be no choice at all.

Intentional interference with space-based ISR, navigation, and communication satellites, while not routine, now occurs with some regularity. America's ever increasing appetite for space-based technical solutions for global positioning, communications, and weather among others, if not properly managed could become our Sword of Damocles—we must not become trapped in this vulnerable position. Space is now a contested domain where, without adjustments to our strategy, we may not be able to count on unfettered access to space-based systems should others persist in their course of developing counter-space weapons. Strategic Command believes that if we are to ensure our freedom to operate peacefully in space, we must rely upon a balanced acquisition strategy that employs a mix of some highly specialized space-based systems and other less elegant but more responsive space-based systems, and a global system of distributed terrestrial networks to help avoid this undesirable trap and properly mitigate the risk we currently face.

ADAPTING TO THE SHIFTING SECURITY ENVIRONMENT—FIELDING THE NEW TRIAD

The diverse challenges facing America necessitate a mature strategy that reaches well beyond the blunt, cost-imposition approach of Cold War planners. This strategy must be equally adept at denying the benefits our adversaries might seek to gain and encouraging restraint even in conflict. We understand well that policy-makers will consider a range of options including diplomatic, military and economic. The Department of Defense (DOD) will in turn consider options spanning offense and defense, kinetic and nonkinetic, conventional and nuclear, as appropriate to the political-military context. Strategic Command has multiple roles to play in peacetime and conflict, not the least of which is providing sufficient intelligence, surveillance, and reconnaissance upon which decisionmakers will act. We must ensure U.S. freedom of operation in space and cyberspace, connectivity sufficient to exercise global command and control, integrated missile defense, and upon order, provide kinetic or nonkinetic global strike. Central to this strategy is the New Triad, which remains the foundation for our strategic approach to global deterrence.

The New Triad is comprised of integrated offensive and defensive capabilities enabled by persistent global command and control, robust planning and intelligence, and a responsive defense infrastructure. The New Triad, when mature, will provide improved agility and flexibility in dealing with a wider range of contingencies. Our goals are to avoid undesirable competition, discourage proliferation, assure allies and deter aggression, particularly from WMD-armed adversaries, by maintaining sufficient strategic margin and flexibility vis-á-vis our competitors.

While the vision of the New Triad concept is sound and we have made progress, the shift in the global environment threatens to outpace the implementation timeline. Our ability to seamlessly integrate defensive and offensive capabilities requires the more mature set of capabilities we are working toward. The remainder of this statement will outline the important roles of our various mission areas and highlight those needs we see as essential to meeting our goals.

Intelligence, Surveillance, and Reconnaissance (ISR)

Our Joint Functional Component Command—ISR has achieved full operational capability and begun adjusting our transactional model. Our current ISR capabilities and allocation processes were designed to focus on nation-states possessing traditional military capabilities and supporting infrastructure. Today we face adversaries who avoid our strengths and seek to attack through nontraditional means.

Our ISR enterprise, designed to confront the former Soviet Union and the Warsaw Pact, is not optimized for either collection against, or analysis of, these new adversaries. Our initial assessment reveals that although we have increased the volume of collection, disparate sensor and requirement management procedures have resulted in redundant collections and system-wide inefficiencies, further stressing an overburdened ISR enterprise. These inefficiencies inundate our analytical teams with volumes of data, rather than providing the right information at the right time. As a Department, we effectively meet less than one third of our combatant commanders' warfighter information needs through these outdated systems. At the same time, the National Reconnaissance Office manages collection of national-level intelligence requirements for the Director of National Intelligence. We have invested significant energy in strengthening this partnership with the National Reconnaissance Office in an effort to streamline and better integrate collection management.

Our objective is to optimize use of the Department's ISR resources by eliminating requirements and collection redundancy, streamlining the process to deploy ISR assets, and conducting genuine assessment of those operations. Our goal is an efficient global ISR enterprise, focused on achieving persistent collection capabilities against legacy and emerging threats through enhanced global sensor management of U.S. and coalition capabilities. We seek your support to improve our global situational awareness, and analytical capability to model and simulate the system of collection systems, spanning national, DOD, and coalition collection. Enhanced situational awareness and modeling and simulation capabilities will advance our ability to more effectively employ the assets we possess and move us closer to fully exploiting the data we collect.

Integrated Missile Defense

Because the threat posed by the proliferation of ballistic missile technology and cruise missiles is serious, a credible missile defense capability is now an essential element of America's national security strategy. Even at this early stage of maturation, missile defense systems influence our adversaries' perception of the economic and political cost they must incur to pursue ballistic missile technologies. While missile defense as a defensive shield is important, its value as a dissuasive force or deterrent is proving far greater.

Our integrated ballistic missile defense program had an excellent year. Within a 90-day period we successfully intercepted ballistic missiles at low and high altitudes; in mid-course and terminal phases; and, in endo- and exo-atmospheric environments. We increased the numbers of our AEGIS tracking and engagement ships, ground-based interceptors in Alaska, and gained confidence through testing and deployment of the Forward-Based X-Band-Transportable and Sea-Based X-Band radars to Japan and Alaska respectively. At the same time, Sentinel radars and Avenger Air Defense systems participated in a combined Northern Command-North American Aerospace Defense training exercise in July 2006 to test our ability to rapidly deploy sensors and joint air defense systems to defend key assets against cruise missile attack.

The July 4, 2006, North Korean missile launches spurred a limited operational activation of the Ballistic Missile Defense System (BMDS) and, as a result, helped us streamline our plans, tactics and procedures. We learned that the BMDS, procedures, and personnel performed well, and demonstrated a credible operational missile defense capability for homeland defense. An initial investment by the North Atlantic Treaty Organization in construction of a BMD command and control system along with growing interest by countries throughout the world in hosting both radar and interceptor bases are testaments to this credibility. Japan has accelerated and expanded its cooperation program with the United States for ballistic missile defense, and South Korea recently committed to developing short-range ballistic missile defenses. We expect discussion of forward deployment of radars and interceptors in Europe to continue with our Allies as attention on the emerging threat in Southwest Asia grows.

As we move forward in the next year, more work remains. We must integrate air and cruise missile defenses with our growing ballistic missile defense system. Continued progress also requires further research, development, test and evaluation of individual components and end-to-end testing to validate sensor and shooter integration. Partnering with the Missile Defense Agency and the other DOD Service Components, we expect to further evolve the BMDS by adding new elements to the integrated sensor network. These elements will include cruise missile defense capabilities and extant intelligence collection sensors that will contribute to our situational awareness and overall integrated missile defense capability. In addition, the first two Space Tracking and Surveillance System satellites will be placed on orbit to demonstrate our ability to protect avenues of approach that can't be protected by

other means. We also plan to increase the effectiveness of our system by improving target discrimination capability through integration of advanced algorithms in the Forward-Based X-Band-Transportable and Sea-Based X-Band radars.

Information Operations

We made progress in growing Information Operations Capabilities into core military competencies. We will continue to develop these and related Strategic Communications planning capabilities to ensure that all Joint Force Commanders gain and maintain the information advantage over our adversaries throughout the entire spectrum of regional and trans-regional engagement. As our capability centers, specifically for Electronic Warfare and Strategic Communications planning support, reach maturity, we will be able to provide trans-regional planning and integration support and strategic effects assessments responsive to the demands of the new Triad.

Cyberspace Operations

Earlier in this statement we noted that attacks in cyberspace are a matter of great national interest. Cyberspace has emerged as a warfighting domain not unlike land, sea, and air, and we are engaged in a less visible, but none-the-less critical battle against sophisticated cyberspace attacks. We are engaging these cyberspace attacks offshore, as they seek to probe military, civil, and commercial systems, and consistent with principles of self defense, defend the DOD portion of the Global Information Grid at home.

The National Strategy to Secure Cyberspace describes cyberspace as the nervous system of our country and as such, essential to our economy and national security. It describes a role for all Federal departments and agencies, state and local government, private companies and organizations, and individual Americans in improving cyber-security. The National Security Strategy to Secure Cyberspace lays out a framework that seeks to deter our adversaries and assure our freedom of action in cyberspace. Fundamental to this approach is the integration of cyberspace capabilities across the full range of military operations.

Strategic Command is charged with planning and directing cyber defense within DOD and conducting cyber attack in support of assigned missions. To date, our time and resources have focused more on network defenses to include firewalls, anti-virus protection, and vulnerability scanning. While generally effective against unsophisticated hackers, these measures are marginally effective against sophisticated adversaries. History teaches us that a purely defensive posture poses significant risks; the "Maginot Line" model of terminal defense will ultimately fail without a more aggressive offshore strategy, one that more effectively layers and integrates our cyber capabilities. If we apply the principles of warfare to the cyber domain, as we do to sea, air, and land, we realize the defense of the Nation is better served by capabilities enabling us to take the fight to our adversaries, when necessary to deter actions detrimental to our interests. Our adversaries seek to operate from behind technical, legal, and international screens as they execute their costly attacks. If we are to take the fight to our adversaries, we will need Congress' help to find solutions to penetrate these screens.

Space Operations

Freedom of action in space is as important to the United States as freedom to operate in the air and sea. In order to increase knowledge, discovery, economic prosperity, and enhance the national security, the United States must have robust, effective, and efficient space-based capabilities. The United States considers space systems to have the right to pass through and peacefully operate in space without interference, not unlike that of transit through international waters. Consistent with this principle, the United States views purposeful interference with its space systems as an infringement on its rights, and furthermore considers space capabilities, including the ground and space segments and supporting links, as vital to its national interests. Recent events make it clear others may not share these values. Platforms costing billions of dollars to replace and the lives of astronauts from many nations are now at risk from debris left by China's recent ill-advised anti-satellite test.

Historically, space situational awareness (SSA) was focused on the cataloging, tracking, and monitoring of objects in space via the space surveillance network. Today it is clear we must have better space detection, characterization, and assessment tools. We require capabilities that enable rapid threat identification and attribution, facilitate a defensible architecture and provide fundamental shifts in space awareness. To this end, Strategic Command has created the Joint Space Operations Center (JSpOC) to ensure a more focused global command and control of our space

operations and systems. We are in the process of colocating and consolidating the Space Control Center and the JSpOC at Vandenberg Air Force Base in California.

We have provided, through the Secretary of Defense, a recommended plan for the establishment of an Operationally Responsive Space Office. The overall goals are to strengthen the Nation's space leadership and ensure that space capabilities are available in time to further U.S. national security, homeland security, and foreign policy objectives. Our recommended guidelines were to increase and strengthen interagency partnerships to ensure a focused and dedicated unity of effort. Interagency partnerships provide opportunities to jointly identify desired effects, capabilities, and strategies. Departments and agencies will capitalize on opportunities for dynamic partnerships—whether through collaboration, information sharing, alignment, or integration. To minimize the threat to our space capabilities now and in the future, we need continued support of programs that enhance our SSA, space protection capabilities, and satellite operations in order to preserve unfettered, reliable, and secure access to space.

Global Strike

The devastating attack in September 2001 made it clear that we must engage our enemies offshore, or suffer further damage at home. To do so, we require a robust mix of capabilities tailored to a wider range of potential adversaries and spectrum of challenges than yesterday. The DOD has aggressively pursued this wider range of capabilities over the last decade by pursuing a highly effective mix of advanced conventional systems designed to take the fight to our adversaries with sufficient precision to enhance the credibility of our warnings and effectiveness of our strikes.

However, while the DOD deploys and when necessary employs these expeditionary forces around the globe, it is unlikely we can or will have forces in every place we need them at the crucial moment when we have an opportunity to deter or respond to an attack, be it conventional or otherwise. A timely response will be possible using these conventional forces if they are properly equipped and positioned in near proximity to the emerging threat. If our forces can't be in position to respond rapidly, it is prudent to have the ability to defeat attacks or eliminate high value or fleeting targets at global ranges rather than suffering the consequences of an attack. We have a prompt delivery capability on alert today, but it is configured with nuclear weapons, which limits the options available to our decisionmakers and may reduce the credibility of our deterrence.

The capability we lack is the means to deliver prompt, precise, conventional kinetic effects at intercontinental ranges. Several analytical efforts are underway or have been completed to assess mid-term options. For example, Air Force Space Command is developing a promising concept for a continental United States-launched conventional strike missile, which capitalizes on the maneuverability and precision-to-prompt-effects offered by maneuvering flight technology to produce effects at global distances. Army Space and Missile Defense Command is actively working thermal protection and management solutions that can be effectively used across the range of potential advanced PGS solutions.

Unfortunately, the threat we face is more virulent and arrived at our shores earlier than expected. Because the threat has outpaced our search for solutions, we have examined many plausible alternatives and believe a near-term solution to deploy a precision global strike missile within 2 years of funding is essential to adequately defend the Nation offshore. This near-term capability should be part of a larger strategy to explore, test and field other land, sea, or air-launched alternatives to produce effective mid (2013–2020) and long-term (2020 and beyond) solutions.

Combating Weapons of Mass Destruction

For more than half a century we lived in a world in which the few major powers possessing nuclear weapons walked a cautious path of mutual deterrence. For years we have encouraged those nations retaining chemical and biological weapons to disavow them as the major powers did long ago. To its credit, Libya has raised its profile within the international community by divesting itself of WMD that did not and could not guarantee its security; it is too soon to know for North Korea.

Strategic Command's role is to integrate and synchronize DOD efforts in support of national efforts to combat WMD, on a global scale. Strategic Command is therefore actively engaged with the national laboratories, the Director of National Intelligence, National Counterproliferation Center, National Nuclear Security Administration (NNSA), the Defense Threat Reduction Agency, the Department of Homeland Security, regional combatant commanders, and others to better coordinate, integrate, and synchronize our collective response to the threat. We provide support to Nonproliferation Treaty initiatives, the Cooperative Threat Reduction program, and the Proliferation Security Initiative. We recently completed a WMD Elimination

Concept of Operations, and will soon activate a Joint Elimination Coordination Element to serve as the core of a Joint Task Force-Elimination, should such a force be required.

We ask for your continued support in helping us build on the successes realized through programs like the Nunn-Lugar Cooperative Threat Reduction Initiative. Resources that enable us to scale the attributes of existing programs to a global level, will provide global combating WMD capabilities by building global partnerships, using a global perspective, with the tools and metrics to judge value, and allow individual or regional WMD interdiction and elimination by host nation-state process owners. This process focuses on enabling "nation self help," where empowered nations are stakeholders and active participants in the fight to interdict and eliminate the threat of WMD. By participating with these nations, our actions reinforce their status as a sovereign state, elevate their standing, reinforce their status, and are a positive step forward for America as our partners develop and possess resident counterproliferation capabilities, providing advanced threat reduction and attribution forward from our shores while demonstrating a consolidated front to the threat.

National Command and Coordination Capability

The world is fundamentally more complex than it was when our current point-to-point nuclear command and control system was developed more than 50 years ago. This single-purpose aging command and control system, while adequate to meet our nuclear mission, is not adequate to meet our broader national objectives. As we seek to sustain the essential core nuclear command and control system, we see an opportunity to transform this 1950s Cold War capability into a government-wide national communications capability. To do so, we must take advantage of modern networked architectures.

At the outset, our strategy was two-fold, first to sustain our legacy nuclear command and control system and second to expand its capability to address a broader scope of military challenges. These investments would better integrate all elements of national power and increase our ability to quickly respond across a broader spectrum of military threats. However, our national experience in Hurricane Katrina made it clear that America needed more and we expanded the scope of our effort to improve the Nation's ability to support civil authorities following disasters or other domestic events. The President has subsequently provided guidance to develop a robust, enduring, secure, survivable National Command and Coordination Capability (NCCC) that integrates our legacy nuclear command and control functions into a net-centric NCCC. In support of these objectives, we have developed partnerships with the Departments of Homeland Security and Justice, and Director of National Intelligence.

The goal is to create a NCCC that not only meets national command and control requirements, but can become the versatile and stable backbone of a nationally distributed network to meet other important homeland security requirements. Through an integrated and adaptive approach, NCCC will enable a responsive, universally collaborative and virtual environment for all users. We are well on the way to realizing this vision. Actions to date include modernizing our airborne components, distributing our ground components, and increasing network capacity.

Safety, Security, and Reliability of the Nuclear Stockpile

The NNSA and the DOD share responsibility for the safety, security, reliability, and effectiveness of the Nation's nuclear warhead stockpile and for the quality and responsiveness of the enterprise necessary to sustain it.

During the last decade, our Nation invested in increasing our scientific understanding and extending the life of weapons designed and produced during the Cold War. To date, these efforts have successfully ensured the reliability of our weapons without the need to conduct nuclear tests. While this strategy has served the Nation well, we recognize the current path of indefinitely relying on legacy nuclear designs refurbished through a series of life extension programs entails accepting significant future risks and potentially large costs, to reliability/performance, safety, security, and responsiveness points of view. For this reason, we support a Reliable Replacement Warhead (RRW) program as the best path forward to improve nuclear weapon safety, security, and reliability and advance our goal of the lowest possible stockpile levels consistent with national security.

The 2001 Nuclear Posture Review described a need for a responsive production infrastructure, capable of responding to a strategic surprise, as part of its comprehensive nuclear strategy. The combination of the RRW program and responsive infrastructure investment are key elements of our overall strategy to further reduce our nuclear warhead stockpile to the lowest level consistent with national security requirements and move the Nation from an inventory-based to a capability-based

risk management strategy. As the comprehensive strategy for the nuclear enterprise matures, the RRW program will replace extant nuclear warheads with increasingly modular and interoperable warheads that are safer, more secure, and highly reliable, as one element of a broader strategy to reduce our reliance upon nuclear warheads and more aggressively reduce our non-deployed stockpile. RRW designs will incorporate a broad suite of enhanced safety and security features that cannot be attained through the life extension process. Modularity and interoperability remain top warfighter priorities for the RRW concept. These attributes will significantly increase the operational flexibility and responsiveness of the nuclear weapons stockpile and improve our ability to introduce new technologies and respond to technological and/or geopolitical surprise. We ask for your continued support of the RRW program as an integral part of the Nation's comprehensive strategy to meet national security requirements and encourage Congress to continue investing in the transformation of our aging nuclear infrastructure; it is a key element in the sustainment of a credible nuclear deterrent for the 21st century.

CONCLUSION

United States Strategic Command is engaged in a wide-ranging campaign to provide support to all elements of the DOD, assure our allies, dissuade undesirable competition, deter our adversaries, and if called upon to defend our Nation and defeat our enemies. We take this role very seriously and today present you with carefully thought out recommendations. Once again, thank you for your time, insight, and attentiveness to our views.

Senator BILL NELSON. To Ben and Jack: Any questions while we are on this RRW? Then we will move on to other topics.

Senator BEN NELSON. Thank you.

General Cartwright, as we realign our nuclear capabilities are we or are the Russians together with what we are doing mixing the message we are sending to Iran and North Korea? In other words, are we giving them an argument against what we are asking them to do, and that is to denuclearize at a time when we are realigning our nuclear capabilities?

General CARTWRIGHT. Certainly a fair question. We have tried to be as transparent, and the Russians have also tried to be as transparent as possible. We are reducing the stockpiles in ways and in measures that are far greater than anything we have ever done in the past, moving in a direction that retains the minimum number possible, and demonstrates the responsible stewardship of safety and security of these weapons, making sure that they are only used for the appropriate mission.

Senator BEN NELSON. So you think the transparency of what we are doing will not send a mixed message, although we know they will jump on anything that they can? But we are not sending a mixed message because of transparency and what we are doing with the realignment?

General CARTWRIGHT. I believe that we have taken all steps that we should and could to keep from doing that. You always have to make sure that you go back and sample your audience: Am I getting through? Do you understand what we are doing? We try to do that regularly.

That is why we held a 2007 review on both countries' parts, to make sure we were doing the right things, that the message we were sending was appropriate, and that people understood the direction we were heading.

Senator BEN NELSON. Mr. Chairman, I have to go to the Rules Committee markup to make the quorum.

I had one other question I would like to ask, General. We worked hard not that long ago to try to get the retrofitting of the Trident

submarine so that we can have the non-nuclear capability on those submarines for what you described earlier, the more appropriate response or more appropriate reaction to what is going on. Are you still of the opinion that we ought to continue to do that and do you have any suggestions about what we might try to do?

General CARTWRIGHT. Yes, sir. I know that we will go into this in more depth here later.

Senator BEN NELSON. Senator Sessions and I teamed up on that.

Senator BILL NELSON. We are going to go into that in detail.

Senator BEN NELSON. Okay. I just want to continue to add my support for making the retrofitting of the Trident submarine for non-nuclear capabilities.

General CARTWRIGHT. Thank you, sir.

Senator BEN NELSON. Thank you. Thank you, General.

Senator BILL NELSON. Senator Reed.

Senator REED. General, thank you. Just a few specific questions.

Based on the reviews done to date and reviews that will be done by NNSA and the laboratories, you have confidence that the RRW design will be able to be certified without testing?

General CARTWRIGHT. That is a priority in the activity. We have done the first step or the first phase in a developmental activity. This is kind of an exploration. To understand the risks, is there feasibility in moving forward? One of the key criteria was that we had to have high confidence that it would not require testing.

This next phase that we are asking authorization for will get into more engineering detail to confirm that attribute.

Senator REED. If it becomes clear at some point that it is not possible to certify without testing, would you support terminating the effort?

General CARTWRIGHT. I would come back to this committee and tell you why we got to that position and what the criteria were, what the detail was behind that, and then we would have that discussion. But it would be a criteria. We would have to seriously consider whether we would want to move forward at that point.

Senator REED. If successful, the RRW will be a significant improvement in safety, security, and reliability compared with the current?

General CARTWRIGHT. Yes, sir.

Senator REED. Also, it will give increased confidence in the stockpile and enable substantial reductions in your view?

General CARTWRIGHT. Yes, sir. If it is coupled up with the responsive infrastructure, then you have an opportunity here, particularly on the inactive side, where we have large inventories, to drastically reduce those inventories.

Senator BILL NELSON. Convince us of that. For example, the life-extended W–76, is it going to be retired in favor of the RRW, what Jack asked?

General CARTWRIGHT. The approach here is a three-phased approach. We have a life extension program associated with the 76 and we have the inventory that is deployed. We will continue that life extension program with the intent of phasing it out as RRW comes on line and is deployable. So what you are trying to do here is not put all of your eggs in one basket that RRW will come on a certain date. You start the management of extending the life of

the existing warheads. You carry that until you have confidence that the new weapon can replace it and then you phase out that life extension approach to business.

The other piece that is important to understand is the way we tend to manage risk today. We have more than one warhead for each delivery vehicle. So if the 76 were to come up with some sort of flaw, we have other warheads that we could use instead. RRW allows you to do component replacement and get diversity, the ability to replace a component, rather than having to have an entire stockpile of a different weapon.

Does that make sense?

Senator BILL NELSON. Yes.

Senator REED. Just a final question, General. The Nuclear Weapons Council has decided to study the feasibility of the RRW and not to manufacture or deploy the RRW; is that correct?

General CARTWRIGHT. That is correct. The next phase is an engineering level of detail on the feasibility.

Senator REED. Thank you.

Thank you, sir.

Senator BILL NELSON. Tell us about the cost. Are we going to actually be able to get some cost savings in here, even though we are going to develop the new weapon by retiring all of the life extension programs on the old ones?

General CARTWRIGHT. This is always hard because what you add into the cost will drive this. But in the transition RRW from where we are, let us take the 76 as an example today, to the RRW, the intent was that the resources available would remain reasonably flat and we would just transition the resources from one activity to the next.

Senator SESSIONS. By resources you mean money?

General CARTWRIGHT. I do mean money, I do. I also mean infrastructure, people, and intellectual capital. All of those are in the equation. But it is the dollars and cents side of this equation.

In the drawdown of several of the classes of weapons that we did between 2001 and 2007. We also took the savings on the DOD side and partnered with DOE to ensure seed money was available that was realized from standing down some of these weapons and delivery systems. That was to get this activity going, do the engineering work, start to understand a logical way forward, and present the case. So we have taken some of the savings from standing down weapons and delivery systems, used that in order to move forward here, but kept up the W–76 life extension program until we had a high confidence that we could replace it.

So we are trying to stay within the resources that have been programmed and do that across the stockpile. Now, as you have to replace infrastructure, that is where we are trying to understand how quickly that can be done, and can you stay inside the programmed resources or do we have to come back and ask for additional resources.

Senator BILL NELSON. Any more questions on RRW?

Senator SESSIONS. One thing I would like to ask. In your position you have to think about these things. If we went to zero nuclear weapons, it seems to me that would encourage a lot of nations to the belief that they could in fact obtain military superiority over

the United States by simply building a relatively modest number of nuclear weapons. Likewise, if we brought the number so low, even a rogue nation might see it within their grasp to be a peer competitor of the United States.

Are those reasons why we need to be cautious about not going too low in our numbers and would you agree with that general philosophy?

General CARTWRIGHT. I agree with the philosophy. I tend to look at it as how credible is your deterrent and credible to who. If on the conventional nonkinetic side, we are able to, as we have done, say with missile defense, start to be credible, then the level of requirement for nuclear weapons can be drawn down against some of the adversaries. Against adversaries, you may have a different equation where mutual assured destruction is a balance that they are comfortable with. This allows us to reach a point of credibility between two nations that would allow us to have a basis of dialogue, a basis of warning, an ability to know when the other has encroached and be able to say, hey, you are making me nervous, I am going to have to start posturing if you do not change.

But what am I posturing with and is it credible? Today we still need nuclear weapons to balance that equation. The number we need is drastically less than it has been in the past.

Senator SESSIONS. But a nation like Iran, when they consider their nuclear program, I am convinced at this point in history whether or not we are building a RRW, whether we have 1,000 or 3,000 nuclear weapons, that is not the factor driving them to build their nuclear program. Would you agree with that?

General CARTWRIGHT. I would agree with that.

Senator SESSIONS. Thank you.

Senator BILL NELSON. Senator Reed.

Senator REED. Thank you, Mr. Chairman.

I just have a couple questions on the Moscow Treaty, General. Under the treaty, we have committed to have no more than 1,700 to 2,200 deployed nuclear missiles by 2012. But what are the number of reserve missiles that you are planning to meet that level of deployed missiles?

General CARTWRIGHT. In the inactive or not deployed stockpile?

Senator REED. Yes.

General CARTWRIGHT. I cannot give you the number, Senator. I will go find that for you. What we are hoping is that through RRW we can go well below that. I do not know that we were mandated to any level in those particular stockpiles. What I have been trying to say is that one of the values that you can get from RRW is to go after that part of the stockpile, which is still very large.

Senator REED. Do you have kind of a rough order of magnitude, like two to one, three to one, four to one?

General CARTWRIGHT. Let me give you that for the record.

[The information referred to follows:]

The Moscow Treaty does not mandate any specific level for the reserve (not deployed) stockpile which consists of warheads for augmentation, reliability replacements, logistics spares, and surveillance. Today, the ratio of reserve stockpile warheads to the operationally deployed strategic nuclear warheads is greater than one to one. With planned weapon retirements and a responsive infrastructure facilitated by the Reliable Replacement Warhead Program, we are confident the ratio will be significantly less than one to one.

Senator REED. Okay, that is fair.

Is it possible to reach these levels prior to 2012, the deployed levels, to reduce them to that?

General CARTWRIGHT. Yes.

Senator REED. Is that contemplated?

General CARTWRIGHT. We are certainly open to it. Part of it will depend on the engineering level work in RRW. Is 2012 realistic for RRW to come on line, which is a challenge technically, but is it far enough along that we have gained confidence that we can start to reduce, inventories and have capabilities like missile defense come on board with a proven credibility as a deterrent factor to start to influence the deterrence equation?

Those factors will all contribute to us being able to drawdown faster. We are ahead of schedule now. We are on a glide path that would put us before 2012 to make the deadlines. But we are watching each year and updating. 2007 is very important.

Senator REED. As I understand the treaty, the deadline comes in 2012 and then it expires in 2012. It is not a permanent treaty.

General CARTWRIGHT. Right.

Senator REED. Would you be supportive of a permanent treaty or making Moscow permanent?

General CARTWRIGHT. My crystal ball for 2012 is probably no better than anybody else's. I think we ought to go look at it as we approach that treaty, to look at what has emerged as capability, what are the threats, what are the threats to our Nation versus what are the threats to the Russians. The equation may change, but I think you want to keep a dialogue like this treaty going and you want to keep it, to the extent possible, binding and keep us on a glide slope towards the fewest number necessary.

Senator REED. We had a hearing last week which was very interesting. Some of the witnesses suggested that we really could go down to a deployed force of 500 missiles and a reserve of 500—warheads, rather. Others suggested 850 to 1,100 deployed, much lower than the Moscow goal. Is that feasible or possible, desirable?

General CARTWRIGHT. It is based on the assumptions. Again, what is the world that we are really living in, what is the ability of our infrastructure to say, gosh, the world was not what we thought it was going to be, we need to go up. I do not want to go in that direction, but are you comfortable that you could recover if you misjudged? That is the risk that you take as you get down to the small numbers.

It does not mean that it is not plausible. It certainly does not mean that that number of warheads is not capable of being a deterrent. The question is how much risk do you want to take that you may have misjudged, and that ought to be a debate and a discussion.

Senator REED. Thank you.

Senator BILL NELSON. Since the Moscow Treaty was more of a goal of 1,700 to 2,200 deployed nuclear weapons, are the Russians going to meet that goal by 2012?

General CARTWRIGHT. They are certainly on a path, as we are, to be able to make it actually ahead of schedule if they judge the world the same way we are judging it right now.

Senator BILL NELSON. Jeff, any more on this?

Senator SESSIONS. A different subject.

Senator BILL NELSON. Okay, what subject do you want to go to next?

General CARTWRIGHT. I will go anyplace you want to go, sir.

Senator BILL NELSON. Go ahead, Jeff.

Senator SESSIONS. We spend a lot of money on ICBMs, on the aircraft capability, the triad, our basic triad of delivery of nuclear weapons. How do you see that as we drawdown these numbers? What capabilities is it wise for us to maintain and not weaken or not adjust much and what others may there be some capabilities of saving in?

General CARTWRIGHT. I think in general the old triad of the nuclear forces is a sound construct.

Senator SESSIONS. Explain the triad?

General CARTWRIGHT. It is the combination of sea-based ballistic missiles launched from our nuclear-powered ballistic missile submarine, the land-based ICBMs that are launched from the missile fields in the United States; and then the bomber capability.

Senator SESSIONS. The theory of that in the Cold War was that at least one of those capabilities would be effective to deter any attack on the United States.

General CARTWRIGHT. Right. An adversary focused on one, you had the other two. We generally thought of the ICBMs, the ground-based, being the most responsive, available quickly if needed; the submarine-based as the type of weapon that had the most resilience and survivability, so if we were caught unaware they were survivable; and then the bombers gave us the flexibility of the man in the loop and the ability to go to the adversary and approach him from an air domain, so to speak.

So we were approaching from three different ways, which is to some extent a cost-imposing strategy. It forces the adversary to defend in three different ways. That has been the philosophy as we move towards the new triad, which accepted the old triad but incorporated defensive capabilities and conventional capabilities in aggregate.

So the question here is can we change the balance of the old triad as we draw down these weapons. We have reduced substantially the number of bombers committed to this activity, the number of sea-launched ballistic missiles that are committed to this activity, and the number of land-based ballistic missiles committed to the triad. Last year we took the last Peacekeeper out of the hole. That weapon system is no longer part of the inventory. We have reduced down to 500 the number of ICBMs and that is going lower here in the next month. We have made notification and we are going to drawdown there. The number of submarines committed and obviously then correspondingly the number of missiles associated with those submarines, the gravity bombs, the number of bombers that we have committed, the number of weapons associated with them, whether they be cruise missile in type or gravity in type, have all been reduced substantially.

Senator BILL NELSON. Go ahead, Jack.

Senator REED. Are we going to join the debate about the precision global strike now?

Senator BILL NELSON. Yes, we are going to.

Senator SESSIONS. I think we should talk about that.

Senator BILL NELSON. We are going to discuss every subject you want.

Senator REED. Despite the great efforts and enthusiasm of Senator Sessions and Senator Ben Nelson, at least, last Congress there was some concern about modifying the Conventional Trident Missile (CTM) to carry kinetic non-nuclear warheads. The Navy has $175 million in the fiscal year 2008 budget request for CTM.

This is a rear guard action perhaps. But anyway, rather than continuing this debate, does it not make some sense to look for alternatives to accomplish the prompt global strike mission other than putting conventional weapons on what is a nuclear platform at the moment? In that vein, would this be a more appropriate defense-wide account, to look at global, new ways to strike within your required short period of time without engaging in this debate about Trident? What is your opinion, sir?

General CARTWRIGHT. The Trident modification was designed to be a hedge for a threat that we believed had emerged, to give us the time to develop more appropriate systems for global strike that could address any number of attributes that were of concern. In other words, one of the keys was ambiguity, being able to discern what the profile equated to, much as we have done with bombers and cruise missiles in the past and other types of delivery systems that had both conventional and nuclear capabilities.

The intent with the CTM was to be able to emerge in 2 years with a hedge capability, hold that hedge capability until in particular Air Force and Navy were able to move forward with a program of record to give us the attributes with a global strike capability in the conventional arena that we felt were appropriate for that activity—speed, range, ambiguity, notice, all of the types of things that you would like to have, A; B, also be credible on the deterrence side of the equation in that they could hold targets at risk credibly and deter somebody from either pursuing a tactic such as using strategic depth to hide their resources or hide their offensive capabilities where we could not reach them with other than a missile or long-range prompt activity.

The other piece here was to also start to impose on the adversary, just as Senator Sessions has alluded to here, a type of offensive capability that would force them to build a unique defensive capability in order to address that threat, much as the old triad had done with three different ways of attacking the problem.

Can we move forward into the future field of options, as you say, to a more regularized, more appropriate global strike capability? We believe we can. We believe that the Navy and the Air Force are on a path to do that. They are working with the labs. They are working actually with the Army. The Army has some pretty interesting ideas in this area. Even though they do not intend to move into this area, they are helping us on the technical side.

So we believe that could start to appear around the 2012 to 2014 timeframe to replace the need for the hedge. Now, what we do get out of the hedge activity separate from putting the warhead on the missile, is the work necessary to do the technical research on heat management, navigation, warhead, design conventional warhead, development that would be placed on these longer-term programs.

So there is a mixture in that $175 million between production type money which would move us on a path to in 2 years field the hedge and the science and technology or research and development necessary to field this next generation of capability.

So can we split that apart? Can we do this differently? Can we discuss whether or not the threat has emerged and whether or not we need to do this with CTM or whether we can wait until 2012? That is why we are here and in this debate.

Senator REED. Congress—and again, this was not an issue that was not without differences of opinion, but the conclusion was that this opens up the proverbial can of worms when you are putting a conventional missile on a Trident nuclear submarine. I do not think we dispute or debate the issue of trying to strike in a short time across the globe. I guess my sense is it would be better to try to accelerate these efforts you are talking about than having a hedge which could jeopardize the deterrence and send conflicting signals, not just to the terrorists who have a secret enclave someplace with weapons, but nation states that have missile systems that they are not going to put at risk or other assets they are not going to put at risk.

General CARTWRIGHT. It is a judgment call. The regret factors associated with not having it today if a target, particularly a weapon of mass destruction, emerged and we wanted to get to it quickly and we had no other way, that is the extreme in the opposite direction.

Senator REED. I understand that. I do not want to belabor the point, but just to clarify in my mind. We have nation state adversaries with WMD which we use Trident submarines with WMD and other means, the triad, to deter and, if not deter, then to successfully retaliate. We are really talking about—and correct me if I am wrong—non-state actors.

General CARTWRIGHT. No, sir.

Senator REED. Well then, or—give me a scenario that we would have to——

General CARTWRIGHT. Let me, without going classified, there are many targets that are out of the reach of our bombers, conventional forces, strategic depth in large countries—the question would be, as an example, how many satellites would we be willing to lose before we went to a nuclear alternative because the only thing we have to reach those targets is nuclear.

Senator REED. But you are positing a situation where a nation state could engage in behavior like shooting down satellites deliberately.

General CARTWRIGHT. I am only trying to say that it is not just the terrorists, a terrorist target, but it is a broader threat spectrum. This is why eventually we want to get to something that is easily understood and can reach out and start to deter those types of targets. The question is do we need a hedge between now and availability of a more regularized capability.

Senator REED. I know Senator Sessions wants to comment, but this goes to basic deterrence theory, and that is one of the advantages of dealing with a nation state is that you have other levers rather than a nuclear attack.

General CARTWRIGHT. Yes, and you want to use all of them before you ever go offensive.

Senator REED. One of the issues and I think the context that this issue came up is in those cases where the adversary is nondeterrable. They have to be preempted.

General CARTWRIGHT. I guess there is a class of targets exactly as you describe, where you would want to be preemptive and you do not necessarily want to escalate immediately to nuclear. There is also, on the other side of the equation, the desire to control escalation in a conflict that might have started, and in both cases you might add value.

Senator REED. Thank you.

Thank you, Mr. Chairman.

Senator SESSIONS. We had a good battle about that last year. First we had hearings on it, and I concluded that the concerns with the conventional Trident launched from an existing nuclear-capable submarine were not likely to be confusing or place us at risk. But I have to tell you, when we voted we did not win that vote. Senator Reed is correct.

I had also discussed last year and over the last couple of years that there are alternatives that are in development and research today, and I know there could be a regret factor if we do not have this capability right now. But have you given any thought to accelerating and giving more emphasis to some of the alternatives that might allay the concerns of our colleagues that any launch would be misinterpreted as a nuclear attack? How far away? What are your thoughts about going in that direction? You have a good bit of money in there after last year's vote and after last year's election I do not think we are going to get any more votes this year, frankly. So what is the practical solution to this? There are alternatives, I think.

General CARTWRIGHT. There are. First, I want to thank the committee for allowing us to have that debate. I think it informed a lot of us and a lot of those who we serve and allowed them to at least see and understand what the issues were. I may have made your life a little more difficult, but I think we served our constituency well by having that debate, and we ought to continue those kinds of debates.

The Air Force and the Navy both have programs that they are embarking upon to bring us to a technical solution that is informed by last year's debate. They are much smarter about what is going to be, let us say, appropriate and what can we match technology with. The question now is could you make it go faster. I do not believe technically you could. You could throw more money at it, but I do not believe that you could accelerate the science that we need to have here. We are seeing steady good progress in reducing what we call technical risk as we move forward. But we are also opening doors in technology that we did not understand before and are now making themselves available to you, and I will let the Air Force and the Navy in their opportunity talk a little more about that.

But there are opportunities now. I do not think you can accelerate this. I think you would be challenged to have an initial capability by 2012—other than CTM—and then start to move forward

from that in a block approach to get us to where we want to go. I think you ought to let the programs lay out that technology.

But a lot of the work that we did at the behest of this committee on bringing together the Army, the Air Force, the Navy, the national labs to start to focus on this problem, start to understand the technical challenges and match them up with what we were discovering in our dialogue has occurred over the last year and a half. That has started to move forward. So I think we have credible ways forward. We have to see, does that technology really mature at the rate that we think we can make it mature and do we have the right investment profile for all of the things that you will have an opportunity to take a look at.

Senator SESSIONS. Just to sum up, I guess, I had expressed concern that maybe we should just try to leap ahead with the new technology, and politically we do not have the votes, it did not look like, in Congress to proceed. But I just would ask you, you are saying that in your opinion, based on your responsibilities, that you do need this before it is likely that this program could be completed, a new type weapons system that Congress would presumably accept is on line? Explain to us how deeply you feel about it, in short.

General CARTWRIGHT. I believe that we ought to have a hedge capability until we can field a program of record, that is an entire program, whether it be Air Force or Navy or both, but a capability. I believe this threat has emerged, based on what you have charged me to worry about and to watch. That is why I was so passionate about this discussion last year. I am no less passionate this year. We have moved a year closer to 2012. How long and how quickly do you want to have this capability? It is a judgment call as to whether or not this threat is something we want to have a prompt global strike capability for now. Or we are willing to wait a number of years between 2007 and 2012 to see a full-fledged capability fielded.

Having what we would call a time to field of 2 years is still something you have. Even if we do not fund this year, in 2 years if we waited a year and said, gee, we might have misjudged this, you say go and the Department of the Navy here along with us could field this in 2 years. Is that cushion, is that safety net, big enough or would you like it shorter or would you like to have the hedge fielded right now? That is the negotiating space—that is the wrong way to say it——

Senator SESSIONS. If new technology were to come on in 2012 and we approve this money for the Conventional Trident, when would the Conventional Trident be fielded?

General CARTWRIGHT. Probably 2009–2010.

Senator SESSIONS. So you have a couple years of padding there.

I see targets that could occur. You could have maybe some sort of attack on our satellites ready to be launched; WMD, you could see intelligence that a nation was about to launch a missile that could be stopped before the launch; or terrorist cells and top terrorist leaders plotting an attack.

There are a number of targets I think that are not academic, but could be very real, hopefully not, but could be very real. So that

is why I supported this. But it is not faring very well at the moment. You need to know that.

Senator BILL NELSON. Some of the flip side of those arguments are that, as Jack said, if a nation state were to suddenly start attacking our satellites that is an act of war, and that would bring into the full array of the defense posture. Then there are the questions that we need to understand the answers to about the alternatives to this as measured against the cost, because we do not really know the cost. Is it going to be $100 million a shot? Is it going to be $5 million a shot? What is it going to be?

General CARTWRIGHT. For the future systems? For CT?

Senator BILL NELSON. For the prompt global strike.

General CARTWRIGHT. Oh, for prompt global strike.

Senator BILL NELSON. Let me ask you on this CTM, would you want to locate this account in a military Service or in a defense-wide account?

General CARTWRIGHT. For CTM, I would put it in a Service account, a Navy program. For the broader capability of prompt global strike, that might be more appropriate for a defense account.

Senator BILL NELSON. Okay. Any more questions on this subject area? [No response.]

All right. Shall we go to national missile defense? Is that all right with you?

Senator SESSIONS. Okay.

Senator BILL NELSON. Go ahead.

General CARTWRIGHT. I had some opening remarks that addressed the missile defense capability. Let me just add a couple of comments to where I think we are. One, the testing has been very successful thus far. Two, the key issues that are in front of us, at least as a commander are expanding and bringing in the Southwest Asia threats and whether or not we want to have that capability, which we believe we are going to need, to devalue the proliferation of ballistic missiles in that region.

The second, that is very important to me, is the expansion of the system beyond long-range ICBMs. We must address those threats that hold at risk our forward-deployed forces, our allies, and our friends. Those are the short- and medium-range ballistic missiles, things that Patriot, the Standard Missile (SM) 2 and 3 will be able to address, and Terminal High Altitude Area Defense (THAAD). Starting to bring and integrate that system together so that we do have an ability to have a collective defense with allies and the ability to have a global capability against short, medium, and the ICBMs. Those focuses I think are where we want to be heading as we move forward.

We have a pretty good understanding of the science. We are demonstrating, particularly with the SM–3 and Patriot and THAAD, the broad range of capability of layered and collective defenses and sensor integration now on a global scale. We need to expand that out and bring credibility to it, allow the Services now to field these systems as indigenous organic capabilities, but allow them to mix and match without regard to Service lines. So an Aegis destroyer ought to be able to guide to terminal a Patriot and a Patriot battery radar or a land-based radar ought to be able to guide to conclusion a sea-launched missile.

The reason you want to do that is most of our missiles far exceed the capability of their sensors, and so you want to take advantage of that range, broaden yourself out from just a point defense to an area capability. As an example, a THAAD battery can cover the entire peninsula of South Korea, one battery. That is the kind of area capability we need to bring to the equation to defend those forces against short- and medium-range ballistic missiles, which are the ones that are really proliferating out there.

I will leave it at that.

Senator BILL NELSON. Which one of you needs to go first? If you have a time problem go ahead, Jack.

Senator SESSIONS. I am going to be here.

Senator REED. Let me just follow up on the major point you made, General, which is I presume it is the view of your combatant commanders and also you have done some joint capabilities force mix studies that it is these short and intermediate missiles, PAC–3, Aegis, BMD, that really more are needed than less; is that fair?

General CARTWRIGHT. From an inventory standpoint?

Senator REED. Inventory standpoint.

General CARTWRIGHT. Yes, but again SM–3 has mobility, which is a great attribute. Patriot has some mobility, but they are for terminal point defense. They have a very small footprint on the ground. So as you can see, whenever there is a conflict brewing people want more of them than exist, and you will never have enough to cover say the entire coast of a country or something. So you need an area asset. That is why THAAD is so important to us.

But yes, in general short- and medium-range are the ones that are proliferating. They are the challenge right now.

Senator REED. That is what you are hearing from your combatant commanders?

General CARTWRIGHT. Yes, sir. That is what they are asking for.

Senator REED. More PAC–3s.

General CARTWRIGHT. Get us something like THAAD, that has this large area, because as you move to chemical munitions and things like that the ability to keep them away from the forces is critical to the commanders.

Senator REED. As we increase both the technology and the number of our missile defense capabilities, other countries will take notice of this. There is one area in particular, the Chinese, who are beginning to make improvements in their missiles. Do you believe that this will produce a reaction on the part of the Chinese? Will they feel that they have to increase their strategic capacities to negate our missile defense system? Not only our missile defense system, we are talking to the Japanese, we are talking to many others, where if it was sold in our own control they might be more sanguine.

General CARTWRIGHT. There is generally an axiom, at least for the military, that you can only go so far on a defensive capability and you hit diminishing returns very quickly. You have to have it balanced with an offensive capability to be credible. The capability that we are fielding does not hold at risk a large nation state on the defensive side.

There has been a substantial dialogue with the Russians about the European site. But 10 interceptors do not really change the cal-

culus on the number of offensive weapons that a country like Russia has. But it is something that has to be discussed and to just sit silently is inappropriate for them. So we have to have this discussion, as we did in the Cold War: What makes you the most uncomfortable? Is it the time to react? Is it the proximity? We need to understand these issues and then adjust in a way that retains the credibility, but also allows them to understand what we are doing.

Senator REED. Let me ask a final question. You say in your prepared remarks we need a credible missile defense capability, and at what used to be called the theater missile defense area we certainly have made progress there in terms of the systems we have talked about. The national missile defense system is still not yet operational, I think. Is that fair?

General CARTWRIGHT. We took it operational for the 4th of July when we had the Korean missile launches. The reason that we are not operational today in principle is that the command and control suite is one that is either configured for test or configured for operations, and we have elected until we have one that can do both, to bias that to test and development.

Senator REED. But at this point, it is not an operational system? It is still a testing system?

General CARTWRIGHT. From that standpoint, yes. It has a certain number of hours to recall it.

Senator REED. The point I think is that it will become credible when it is fully operational; is that axiomatic?

General CARTWRIGHT. Sir, I actually believe that it has become credible already, but it certainly will add to it when it is operational and people see that it does in fact stand the test of time.

Senator REED. Now, we went operational at the point at which the North Koreans—remind me, what did they do to make us go operational?

General CARTWRIGHT. This was a launch. It occurred on the 4th of July. We started to prepare for it much earlier than that. It was the Taepodong 2 along with some short- and medium-range missiles that they launched at the same time. So we had the system configured in an operational way based on an inadequate understanding of North Korea's intent and ambiguity in their actions.

With the Russians and the Chinese, we generally exchange information about what we are going to do, we close down air space. So we know what is going on, and then if something deviates you can react. We did not have that kind of dialogue with the North Koreans. It left a lot of ambiguity in the discussion.

Senator REED. But we had enough intelligence that they were preparing for a test missile launch that the determination was to "make this operational"?

General CARTWRIGHT. Yes, sir.

Senator REED. But we are in a very strange world, where post-operational systems, once they are made operational, stay operational because you have done all the testing or most of the testing, or what you are going to do is little add-ons. Here we still have some significant systems to test, radars to deploy, to fully implement the systems.

General CARTWRIGHT. As I testified last year, we have a thin line capability. In other words, we have a command and control, a weapon, and a sensor layer. What we are trying to do now is build redundancy into that system along with scale for both an east and a west capability. That is what we are focused on right now.

At the same time, as you alluded to, the adversary is not sitting still. So there will always be an ongoing activity of, do I need to improve this? Is it justified to go in and spend the money to improve it because the adversary did something new.

Senator REED. Thank you.

Thank you, Mr. Chairman. Thank you, Senator Sessions.

Senator BILL NELSON. Jeff.

Senator SESSIONS. General Cartwright, I remember recently we had a hearing and Senator Thune asked Admiral Keating, who would be the user or deployer, I guess, user of the national missile defense, do you have confidence in our missile system today, our defense system? He replied: "I do have confidence in the system, Senator. We were prepared to deploy that system." That was on the Korean July 4 launch.

He also noted about the September 1 successful test of last year after that, "further reinforced my confidence in the system and I appear before you today as confident as I know how to be in the employability and efficacy of that system."

Do you share that view and do you believe that we have a system in place now that has really altered in some significant way our strategic capabilities?

General CARTWRIGHT. I do. I have equal enthusiasm to this as Admiral Keating demonstrated. It has affected our adversaries. The dialogue has been in the open press, but also in the performance and the actions of our allies in contributing to and starting to develop indigenous capabilities and trying to find ways to integrate with our capability.

There has to be some way to start to devalue particularly these short- and medium-range ballistic missiles. They are proliferating too quickly and they are removing the opportunity to have a debate because they act so quickly. There is no warning. You have to find some way to devalue this, and missile defense at least makes your adversary think twice before they would use those types of weapons.

Senator SESSIONS. I think it is important both for our actual physical defense and to devalue a perceived advantage an adversary may have with a small number of missiles that might reach the United States. I think they could consider that they have a very substantial leverage, threat capability, and intimidation capability against the United States. That could lead them to be overconfident in what they do, to take actions that are reckless and could lead us into a situation of great peril, whereas if they have to know that there is a very realistic chance if they launch an attack it would be defeated and knocked down by a missile defense system, that they would be then further subject to very great attack in return, they can add the situation up.

So I think that is good.

I am very interested in and believe it is quite significant what is being discussed about a European site. Would you share with us

your thoughts about that, what strategic benefit if we create a GMD site in Europe with, say, 10 interceptors?

General CARTWRIGHT. The activity associated with Europe when you look at it in comparison to the Pacific activity, we prioritized the Pacific first and we built our capability in the Pacific. History will only tell what effect it really has had in the theater and how much of it was negotiation versus posture versus a credible defense, credible offense, but what is occurring in North Korea is not something that any of us would have predicted. What has occurred amongst our allies in using missile defense as a credible way to deter combat rather than encourage it has been significant.

Senator SESSIONS. You are talking about our Pacific allies?

General CARTWRIGHT. The Pacific. So the question is can you take those attributes and move them to Southwest Asia, Europe, and is there a need for that? I would say that, particularly as you look at Iran, who is fielding and testing and flying short- and medium-range ballistic missiles with a desire to move on to the ICBMs and space, et cetera, and couple that with their ambitions for nuclear capabilities, that we have a significant threat emerging there. Iran is certainly already a threat to their neighbors, and on a path by their own admission to be able to reach intercontinental ranges.

Do we wait until a threat emerges to put this capability in place or do we go now and see if we can start to influence it before it happens? To me this is significant. We ought to be trying to inhibit this activity sooner rather than later. Missile defense is but one venue by which we ought to be trying to do that, and certainly the Nation is approaching this through all of the elements of national power. But we have to bring this into check and get this into a balance that is more appropriate than the current path that we are on, which threatens neighbors and eventually brings WMD into the equation.

Senator SESSIONS. The North Koreans attempted to send us a message on July 4. I have expressed before I hope the Iranians do not attempt to do that in Europe on Bastille Day or some such day, but it certainly got our attention as a people, the American people. I also believe that the same principles will apply in Europe as you suggested are applying in the Pacific.

I have one other specific question, but you can go.

Senator BILL NELSON. Just on this very subject, NATO has not decided that it wants missile defense of its population and territory, has it?

General CARTWRIGHT. As a body it has not.

Senator BILL NELSON. Which would be prerequisite for us locating such missiles in Europe?

General CARTWRIGHT. In NATO, in a NATO environment, that is incorrect.

Senator BILL NELSON. Is that correct?

General CARTWRIGHT. That is incorrect per OSD Policy, NATO permission is not required in order to proceed with missile defense in Europe.

Senator BILL NELSON. Tell me, does a national missile defense system, does it have to be operationally effective to be credible?

General CARTWRIGHT. The balance here is interesting. If you are on a path that is credible, and we are a relatively open society, so people watch tests, they watch and openly debate whether things work or did not work, but as you gain momentum and credibility in your test program, you may well start to influence deterrence before you are operational. That has, to some extent, occurred with missile defense.

There is more than one side to this equation. We had an adversary in this case who is positioned in the area where we were developing missile defense. They, around July 4, decided to fire off some missiles. We had capability, that was discussed very openly. The dialogue went back and forth. All of that has lended to credibility in deterrence ahead of the actual operational capabilities we intend to field, but certainly recognizes where they are going and that there is credibility in the vector that missile defense is on.

Does that help you?

Senator BILL NELSON. That is a fair statement. Now, in order to be operationally effective, what point in our testing do we have to reach before we know it is operationally effective?

General CARTWRIGHT. I will let program managers speak to their side of the equation. From an operational commander's perspective, I want to know that we have a dedicated command and control system that is always available, along with a sensor and weapon grid that is available and does not have to be taken off line for large periods of time in order to do R&D. We believe we will reach that somewhere towards the end of this year.

Senator BILL NELSON. We are going to get into detail on this with General Obering, but from what you have observed do you have the confidence in the system through the testing that has occurred thus far?

General CARTWRIGHT. Both for the short- and medium-range forward-deployed capabilities, the SM–3, the Patriot, and as the THAAD starts to emerge, and very definitely with the ground-based interceptor system that defends against the long-range intercontinental, I, like Admiral Keating, believe that the test profile is on a positive vector, that we are very comfortable operationalizing that capability when we have the redundant command and control and sensor grids, which we should have this year.

Senator BILL NELSON. But looking not at the layers—we have lots of layers that work. Looking at the rockets in the ground in Alaska, you as a combatant commander, do you think when they fire at an incoming ICBM if one were launched from Russia today that we would hit it?

General CARTWRIGHT. One, it is focused on the rogue nation, so it is focused on a less sophisticated threat than Russia or China.

Senator BILL NELSON. You are talking about North Korea.

General CARTWRIGHT. Right.

Senator BILL NELSON. If it were North Korea, we could hit it down with those other layers.

General CARTWRIGHT. Not necessarily. It depends on the type of missile that we are going after here. With TD–2 and an ICBM, you are not going to have those capabilities with the shorter-range missiles. You are going to have to have the ground-based interceptor.

The missiles that are in the silos in Alaska and California are going to have to be the ones that go after that type of missile.

Senator BILL NELSON. You think in a less sophisticated system like North Korea that we could knock it down?

General CARTWRIGHT. Yes, sir.

Senator BILL NELSON. Do you think we could knock down a Russian ICBM?

General CARTWRIGHT. I believe there would be a lower probability of engagement success against a sophisticated threat.

Senator BILL NELSON. We just want to get your perspective as a combatant commander. We are going to grill General Obering about this, because what we have not gotten up to this point is accurate information about the testing regime of this whole thing. We want it to be successful, but we want to know that it is successful, not with some just hope that it is successful.

General CARTWRIGHT. Hope is not a good strategy. It does not lead to a credible defense or deterrent capability. I agree with you, Senator.

Senator BILL NELSON. I have never understood how you could deploy something that had not been completely tested.

General CARTWRIGHT. We have done that many times to stay on the cutting edge of technology against an adversary. A different case would be the Joint Surveillance and Target Attack Radar System (JSTARS).

Senator BILL NELSON. JSTARS, that is one thing, to get up in a platform, in a Boeing 707, looking down at a battlefield, which we did very successfully in the first Gulf War. It is another thing to hit an incoming warhead in outer space in a testing program.

General CARTWRIGHT. It is incredible what they have been able to do, but between myself and Admiral Keating when he was North Command (NORTHCOM) and is now Pacific Command (PACOM), and Admiral Fallon at the time, working with this program, working with the people that work it, we believe that it can work.

Senator BILL NELSON. The Chinese have shown us that they can hit a less challenging target now that they have done an ASAT. Tell us what you think about that?

General CARTWRIGHT. The ASAT test by the Chinese, one, was not a surprise. This was their third attempt. What was, for us, impressive was that in three attempts they made significant changes each time and were able to come to a successful intercept on their third attempt. It was impressive science and the engineering that went into that activity to get them to that level of capability.

Having said that, direct ascent ASATs in and of themselves are a relatively expensive and inefficient way to address a space threat. We came to that conclusion. The Russians came to that conclusion a while back. I personally believe that the Chinese will come to the same conclusion. But they have undertaken a very disciplined and comprehensive continuum of capability against space, our space capabilities, all the way from temporary and reversible effects, examples would be GPS jamming, things like that, communications jamming all the way through direct ascent ASAT. Eventually they will probably be looking at co-orbital, and then the one that you really worry about is introducing WMD into space on a missile.

But they have demonstrated the capability across the continuum. On the lower end of the spectrum, they have not only demonstrated it; they have fielded it into their forces. To me that demonstrates, one, that they have a very comprehensive look at what they want to be able to do as a nation in their region. Does that require from our standpoint that we do in kind the same type of activity? In other words, do we need to now think about weapons in space and ASAT type capabilities, et cetera? We have the technical capability. My belief right now is, knowing what we believe we know about this threat after the demonstration, that it is premature to start thinking about an arms race in space. There are, as you said earlier, many other ways to address a threat. We do not have to have a space response to that threat.

Now, having said that, I do believe it is prudent to improve our posture and situation awareness in space. Who is doing what, why are they doing it, where are they, attribution, a disciplined way to know when there is an anomaly going on in space, and be able to then challenge as to why it is an anomaly, and what is the intent behind the owner of that particular craft?

Those are things that we have to spend some time on. We have been and I believe we are on a good path in that area.

Number two is what do we need to do about the assets that we have on orbit that are associated with national security? What kind of defensive postures do we want to have for them, mostly associated with being able to recognize when they are being threatened, be able to take rudimentary passive type defenses—close shutters, open gates, turn off, whatever is appropriate. You are not going to move a very large satellite which, sir, is the size of a bus out there. That is not going to outrun a Jaguar that is coming on a direct ascent ASAT. But it can tell what is happening, particularly in the lower end of the spectrum in jamming and RF type activities, and in proximity, when something is near it that we did not intend to be near. It can alert us. It can start to give us an understanding of what is going on.

Our first activity ought to be, gee, is this something we planned to have happen, is this something normal in the course, can we explain this? If not, can we react inside of the decision cycle of our adversary to safe that satellite and engage in something other than forceful response to try to stop anything that would harm that asset?

I want to get to a point where we know what is going on out there and we have more choices than just the kinetic option.

Senator BILL NELSON. The initial reports are that they will have the capability with enough production of these ASATs by 2010 to basically knock out most of our satellites in low earth orbit. So you, as a combatant commander, look at alternative programs. We understand that. But what are you advising us that you need in order that we would not go blind from low earth satellites?

General CARTWRIGHT. Prompt global strike.

Senator BILL NELSON. What else?

General CARTWRIGHT. I need the ability to change our sensor capabilities, from one of cataloguing to one that is proactive. It does not require new sensors. It just requires thinking about how you

use them differently so that you are predictive in nature and can understand threats that are emerging rather than reacting.

Senator BILL NELSON. The prompt global strike would give you the strike in order to do what? What, knock out the launch vehicle that they are going to launch the ASAT on?

General CARTWRIGHT. There are any number of nodes in the system in order for them to be able to knock out satellites. There are sensor nodes, there are command and control nodes, there are certainly the launch nodes. Then there is the flight en route. Any of those nodes should be available and we ought to explore alternatives to stop a conscious strike that would take out all of our low earth orbit satellites, and we ought to apply all venues of our national power to intervene on all of those nodes rather than setting yourself up for just one silver bullet, so to speak.

Senator BILL NELSON. Jeff.

Senator SESSIONS. General Cartwright, just briefly on this I would like you to comment on the fact that the Transformational Satellite Communications System (TSAT) has been pushed back another year. We plan three AEH satellites and then we need the fourth satellite, which was going to be the TSAT. Do you believe, since there has been a delay in the TSAT, that we should proceed with an Advanced Extremely High Frequency (AEHF) satellite to be the fourth one to complete the coverage, or do we need to wait on the TSAT?

General CARTWRIGHT. AEHF provides the Nation with those survivable communications that we need when we are stressed, when we are under attack or when other communications have been knocked out for whatever reason. As you can imagine, our appetite for communications and command and control has grown in this information age. So that constellation of satellites is critical to us. We cannot afford a gap in that capability.

If the transition between what is believed to be the next generation, which is based in laser communications in space, which is this TSAT if that is going to be delayed, then we have to fill that gap. Whether that is a fourth AEHF that is exactly like three or whether it has some of the capabilities of TSAT and some of the capabilities of what AEHF–3 had is something that we ought to talk about, or whether we are not comfortable with the technical risk and we just build a clone of AEHF–3. The program managers have to convince me of the approach. But I as a commander cannot stand a gap in that capability.

Senator SESSIONS. I am not exactly sure what the budget request calls for, but we are going to need to answer that question. For us it is the money now.

General CARTWRIGHT. For you it is the money. For me it is the capability. I would be very uncomfortable with any kind of gap in that satellite's capability.

Senator BILL NELSON. We have another panel that we are going to have to move to. Senator Thune, do you want to ask of General Cartwright or you want to ask in the next panel? We have three votes that are coming at 11:45.

Senator THUNE. I would prefer General Cartwright.

Senator BILL NELSON. Go ahead.

Senator THUNE. Thank you, Mr. Chairman.

I appreciate, General Cartwright, your being here. Homeland security obviously is our highest priority and so it is important that we act in a timely and coordinated fashion to deter and defeat threats.

In the National Defense Authorization Bill for Fiscal Year 2007, it was stated that an organizational structure for effective management, coordination, and budgeting for the development and procurement of unmanned systems, including an assessment of the feasibility and advisability of designing a single department or other element of the DOD to act as executive agent for the Department on unmanned systems.

At the hearing last week I asked Admiral Keating, who is the Commander of NORTHCOM, whether he agreed that unmanned systems should be established under a single department and he answered in the affirmative. I would like to ask you that same question. Do you think that establishing a single department to act as executive agent for unmanned aerial vehicles (UAVs) would enhance coordination, promote unity of effort, and reduce the uncertainty and the overlap of responsibilities in the event of a natural or manmade disaster?

General CARTWRIGHT. I am trying to distinguish here and just make sure that I get the right question, but this is talking agency to agency, DOD, Department of Homeland Security (DHS)?

Senator THUNE. Correct.

General CARTWRIGHT. Okay. Yes, I would agree with Admiral Keating. It would help us in moving in a direction to be able to provide the services to whatever agency needed them and to be able to provide surge capability. The advantage of DOD, quite frankly, is that we can plan surge, ability to have platforms that are multifunctional and have multiple customers. DOD could use it, DHS could use it, Justice could use it. That capability then would allow the Nation to have depth. If each agency bought them they would buy the best business case, there would be no surge. You would buy exactly the number of hours you desired for Border Patrol or whatever you would use it for.

Having a single agency provide that—STRATCOM opinion—would allow you to have the attributes that you laid out: unity of command and effort and all those other things.

Senator THUNE. I also posed the following question to Admiral Keating at last week's hearing and he answered the question affirmative. On March 5 of this year the Air Force Chief of Staff, General Moseley, sent a memo to each of the Services as well as the commanders of the combatant commands, which recommends that the Air Force be the executive agency of report medium and high altitude UAVs. I guess the question I would ask of you is, since the existing role of the Air Force is to conduct joint interdependent warfare from the air and through space and cyberspace, and since they have a proven record of providing vital air space and cyberspace capabilities for the Services, would the Air Force be the best choice to be the executive agent for fielding and integrating and operating UAVs?

General CARTWRIGHT. I know the people that wear this uniform may not agree with me, but you are exactly right.

Senator THUNE. I suspect you are probably right, too. I appreciate the answer to that.

I know you are a little pressed for time here, Mr. Chairman. But I wanted to ask as well: You said in your prepared testimony that we lack the capability to respond promptly to globally dispersed or fleeting threats without resorting to nuclear weapons, but then go on to say that your use of a nuclear weapons system in prompt response may be no choice at all.

General, what challenges do you face in establishing a conventional ballistic missile that can take out a globally dispersed or a fleeting threat within minutes, and what other alternatives could we explore that would allow us to have the capability to respond promptly to globally dispersed or fleeting threats without resorting to nuclear weapons?

General CARTWRIGHT. We have gone through the conventional prompt global strike discussion earlier, but to cut to the chase, there probably is not another capability that can reach out and touch, say, whether we go back to the ASAT example or we talk about terrorist camps or someone producing WMD. Our first choice would be conventional forces that were near the problem, and that should solve a large percentage of the activity.

The next issues are those targets where we are not based in theatre. A lot of our adversaries make sure that they do not attack us where we are, so to speak. They go where we are not, look for our seams, things like that. So how many of those targets are there? Of what regret would they be if we allowed them to just have 5 or 6 days free time, so to speak? Which targets can we not reach no matter what we try to do conventionally, deep strategic depth in large countries, places and things like that, where you are not going to drive a bomber or a tank into?

Those are the targets you have to focus on. Which of those targets can we get with the prompt global strike capability that we have today? That was the hedge of the Trident, to increase the credibility of deterrence and keep people from developing threats because we could hold them at risk, and where do we want to be in the future? What did we learn out of the debate last year? What would be the attributes of a prompt global strike system that does not over fly a third party, is much less ambiguous about what its capability is and where it is going, those types of questions.

We believe that we can take those attributes that emerged out of this debate over the past year and bring them into a new system. The Air Force and the Navy are both proposing systems along those lines.

Senator THUNE. I appreciate that. I know that some of the ground has been covered already and I have a question, Mr. Chairman, that you may have already had him answer regarding space systems, but I will submit that for the record in the interest of time.

So thank you, General, for your service and continue to fight the good fight. Thanks.

Senator BILL NELSON. Jeff.

Senator SESSIONS. Just briefly on Senator Thune's line of questioning. I think you are not leading combat ground troops in Iraq at this very moment and I think those uniformed personnel may

not agree with you. In Fallujah right after the big battle there, the marines had a private contract with a company to provide their UAV coverage. This was of course several years ago.

I have for 4 or 5 years really been concerned that the ground soldier is not getting sufficient resources and attention. We have this magnificent Global Hawk and other things that the Air Force has produced that are extremely valuable. I have no doubt that it is. But it also is by far the most expensive. So right now every day we have soldiers on the ground that could benefit from higher resolution, more and cheaper UAVs, and I am frustrated that they are not there.

So as we go through this thing, Senator Thune, we do not want to be bureaucratic about who gets to be the lead and all of that, but there is a very real concern of mine that if we use this fabulous technology that we have we could produce a better UAV to help our Army and our Marines, who are in very difficult circumstances right now. That is just my two cents worth.

General CARTWRIGHT. My comment referenced the Air Force Executive Agency question for medium and high UAVs, not to take away the tactical systems. The Services are going to be able to field their tactical systems. This is for the high altitude systems.

Senator SESSIONS. I am not sure how much they do not—the same technologies. I have always been frustrated. We are getting these stovepipes and situations in which we are not having a common vision. So how we achieve that, I do not know. I do agree that it is an important issue. We need to move forward with it. The Air Force has gotten the lion's share of the money and that is not going to change. But I do want to be sure that the ground soldier at this point in our Nation's history is getting a lot of attention and their needs are being met.

General CARTWRIGHT. You will never find me advocating against supporting the ground soldier or marine.

Senator SESSIONS. I know.

General CARTWRIGHT. By the same token, we have the paradigm of trust, that the definition has been over the years I own it and therefore I can trust it and that is the only way that I can accomplish my mission. I am saying, similar to what the Senator is saying, that we cannot afford that. We have to think of better integrated systems that give the ground combatants the capabilities and the information they need when they need it, where they need it, rather than dedicating to each individual transaction a dedicated resource. We just cannot afford that any more.

Senator SESSIONS. My inexpert opinion is that we have not had sufficient, aggressive, committed attention to providing that resource to the ground soldier, and I would like to see us do better, however we come out on the issue.

Senator BILL NELSON. We are going to have to move on. Just one other question. We have an experimental satellite up there called TACSAT–2 and the sensor has not been turned on. What is going on?

General CARTWRIGHT. The sensors are both turned on. There are two sensors on that package. They have had challenges. It probably would be easier for me to take you to a closed session to discuss it.

Senator BILL NELSON. Let us do that.

General CARTWRIGHT. But it is a wonderful asset and both sensors are in fact operating now. They have not operated as quickly as we wanted them.

[The information referred to follows:]

The TACSAT–2 has two sensors and they were both turned on in January of this year. Currently both the imager and the signals intelligence payload are being calibrated and fine tuned. We expect the imager fine tuning and the target indicator experiment (TIE-signals intelligence payload) calibration to last into May, with both sensors to be ready for use during a combatant command exercise in mid- to late-June.

Senator BILL NELSON. We would like to know the answer to that, so if you can get with us on that, I appreciate it.

Thank you, General Cartwright, and would the next panel please come up. [Pause.]

Your full statements are, of course, included in the record. As you can see how we are conducting this conversation, we do not want you to read any testimony. We are just going to have a conversation, and we are going to interrupt you with questions as we go. We are going to have to be mindful that in 30 minutes three votes are called. So let us see how far we get on this. Senator Sessions and I want to welcome all four of you. So, Mr. D'Agostino, would you please start.

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

Mr. D'AGOSTINO. Thank you very much, Mr. Chairman, and I appreciate the opportunity to come talk to you today about RRW and our Complex 2030 vision. General Cartwright talked a lot about the RRW and the attributes and features that it can provide. There is an element that we probably should talk about a little bit more and that is the impact on our nuclear weapons complex, which needs to be brought out. I think it is very important for you to understand that.

Our complex is a Cold War complex. It was largely put together over the last 50 years. In many cases we have buildings that we are still using that are over 50 years old, using production and manufacturing techniques that we used 50 years ago. We know a lot more today than we did in the past about our impact on the environment, how to make things better, how to use materials and clean technologies that have less of an impact on the workforce.

I believe we are really at a crossroads here. In addition to the transformational aspects of the warhead itself, which I would be very happy to answer questions about, there is an element that does not get talked a lot about, and that is what I would say the hidden legacy costs of doing things the way we used to do them. There is, to my understanding, a fairly significant sized budget in the Department of Labor to pay for and take care of our energy employees that have become sick as a result of work that they have done over the last 50 years. I think that budget is about $1.4 billion. We do not talk a lot about that, but it is important when we consider that when we look at the nuclear weapons stockpile of the future.

My intent is not to replicate the past with respect to how we have done things. I want a much smaller nuclear weapons complex. I want a complex that recognizes and takes account for and designs in less of an impact on the environment. I want a complex that has a reduced impact on our workforce and increases workforce safety. I want, of course, all the attributes that General Cartwright talked about, and there are some classified details of that and I would welcome the opportunity to come brief the committee on those as well.

I think when we factor all of those things in, and particularly the impact on our workers, that we will recognize that we are really at a crossroads here because the Nation, in order to maintain a deterrent—it is not only about maintaining warheads—it is about maintaining the people, the buildings, the tools, the techniques, to be able to respond and provide future governments the opportunity to move as the Nation needs.

I do not know what is going to happen 20 years from now, but I do know I want to preserve the flexibility of Congress and those future Presidents to be able to respond.

So as we go from 70 million square feet, where we were at the end of the Cold War, to the reduction to 35 million square feet in our complex, and I think we can actually reduce it down to about 24 to 25 million square feet with RRW. I think that drives us in the right direction—smaller, more efficient, cleaner, less of an impact on our workforce, and reduce those hidden legacy costs that our taxpayers are paying for right now and that we do not spend much time talking about.

Without reading my oral statement, I think that is one of the points I am passionate about and that I would like to move forward with.

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

PREPARED STATEMENT BY HON. THOMAS P. D'AGOSTINO

INTRODUCTION

Mr. Chairman, thank you for the opportunity to appear before you today to discuss nuclear weapons policies and programs. My remarks today focus on the Reliable Replacement Warhead (RRW) program and our planning for the future nuclear weapons complex infrastructure—we call it Complex 2030. This is my first appearance before this committee as the acting Department of Energy (DOE) Under Secretary for Nuclear Security and Acting Administrator for the National Nuclear Security Administration (NNSA) and I want to thank all of the Members for their strong support for critical national security activities.

My testimony today will focus on the broad strategic context for our nuclear weapons program and, more specifically, describe how the experiences gained and lessons learned over the past 15 years have shaped where we are today and where we are heading in our efforts to "transform" the nuclear weapons stockpile and supporting infrastructure. I will do this by addressing the following questions:

- What is the role of nuclear weapons in the post-Cold War era?
- What was our original strategy for sustaining the stockpile and supporting infrastructure?
- Why do we need to adjust that strategy and why now?
- Where do we want to be in 2030?
- How is our RRW strategy consistent with nonproliferation and arms control?

WHAT IS THE ROLE OF NUCLEAR WEAPONS IN THE POST-COLD WAR ERA?

The policies guiding our nuclear weapons programs, and our strategic capabilities more generally, evolve from the 2001 Nuclear Posture Review (NPR), the follow-on

Strategic Capabilities Assessment (which led to the dramatic reductions in the nuclear weapons stockpile approved by the President and announced in May 2004), the 2006 Quadrennial Defense Review, and the efforts of the Nuclear Weapons Council leading up to the RRW design selection announcement earlier this month.

The totality of this work has resulted in a number of conceptual breakthroughs in our thinking about nuclear forces—breakthroughs that have enabled concrete first steps in the transformation of our nuclear forces and capabilities. The recognition of a more dynamic and uncertain geopolitical threat environment but one in which Russia does not pose an immediate threat, the broad reassessment of the defense policy goals that we want nuclear forces to serve, and the evolution from a threat-based to a capabilities-based strategic force posture have enabled dramatic reductions in the nuclear force as well as reductions in operationally-deployed strategic warheads that were codified in the Moscow Treaty. This has also led to the deep reduction in the total nuclear warhead stockpile required to support operationally-deployed forces.

In response to the new and changing global environment, the United States has appropriately reduced its reliance on nuclear forces. Precision conventional strike and missile defenses are playing a relatively larger role in our overall security strategy and help strengthen deterrence by providing the President with a broader range of response options that can convince adversaries that any aggressive plans would not succeed. But nuclear weapons are still an important component of our security. Moreover, as we continue to draw down nuclear forces, we intend to rely more on a nuclear weapons research and development (R&D) and manufacturing infrastructure that can respond in a timely manner and decisively to any new threats that do emerge. The concept that in an uncertain threat environment we can achieve defense policy goals by relying less on "inventory" and more on "capability to produce" was a profound outcome of the NPR.

What then is the role of nuclear weapons? Why, after the Cold War, are we retaining any nuclear weapons at all? Why are we retaining the number we plan to retain? All are fair questions. The last one is, of course, a work in progress—the President has said that he seeks the lowest number of weapons consistent with our Nation's security and has moved aggressively to that end since taking office. He has authorized a reduction in the stockpile by nearly a factor of two since assuming office. (Details about this reduction, and the rationale for the size and composition of the remaining stockpile were provided in the classified May 2004 Report to Congress on the Revised Nuclear Warhead Stockpile Plan.) As a result of this and earlier reductions, the stockpile today is one-quarter its size at the end of the Cold War.

Several nations currently possess nuclear, chemical, and/or biological weapons, and the means to deliver these weapons, and have given no indication they are willing to give them up. But the rationale for our own nuclear forces is broader. Quite simply, U.S. nuclear weapons:

- Deter nuclear and other weapons of mass destruction (WMD) threats against the U.S., its forces, and its allies. This implies an ability to hold at risk those elements of power that a potential adversary values. While we should not expect that our nuclear weapons will deter terrorist WMD threats, they can deter transfer of nuclear weapons and other WMD from rogue states to terrorist groups.
- Deter large-scale wars of aggression against the U.S. or its allies.
- Dissuade potential adversaries from trying to match or exceed our nuclear capabilities or from engaging in strategic competition. This requires that we maintain a combination of forces and infrastructure so that a future competitor seeking to gain some nuclear advantage would conclude that its buildup could not occur more quickly than the U.S. could respond.
- Assure allies of our continuing commitment to them and of our ability to make good on that commitment—the implication is that nuclear forces must be effective and reliable. This strengthens our ties with allies and also serves our nonproliferation objectives because those allies with the capability to develop nuclear weapons can continue to forego doing so, safe in the knowledge of the reliability of the U.S. nuclear umbrella.

More broadly, nuclear forces are the Nation's "insurance policy" for an uncertain future and remain a key element of U.S. national security strategy. As a result, NNSA must continue to assure the safety and reliability of the U.S. nuclear stockpile and, consistent with the President's direction to continue a nuclear test moratorium, do so without nuclear testing.

WHAT WAS OUR ORIGINAL STRATEGY FOR SUSTAINING THE STOCKPILE AND SUPPORTING INFRASTRUCTURE?

What post-Cold War, post-nuclear testing strategy did we decide would best sustain the stockpile and supporting infrastructure? In the years following the end of the Cold War, budgets for nuclear weapons programs were in "free fall"—funding was simply not available to sustain both R&D and production capabilities. A strategic decision was made to sustain and strengthen weapons program scientific and technical activities in order to ensure a future capability to certify the stockpile. While this was a reasonable decision given the limited resources at that time, in effect we mortgaged the present to ensure the future.

That future was seen as science-based stockpile stewardship and life extension of our Cold War legacy warheads.

When the U.S. stopped nuclear testing in 1992, it sought to replace this critical tool with a Stockpile Stewardship Program (SSP) that emphasized science and technology coupled with a vigorous experimental program as a means to understand better the physics and chemistry of nuclear weapons and their operation, and provided enhanced warhead surveillance tools so that we would have a much better chance of detecting the onset of problems in the stockpile.

The goal of the SSP has been to predict the effects of aging in our warheads so that we could replace aging components before they degraded overall system reliability. The end of the Cold War provided this opportunity—our focus was no longer on a continuous cycle of fielding new warheads to provide new military capabilities, but on sustaining existing nuclear capabilities.

We call this "life extension"—the process of observing the aging of individual components of warheads and replacing them before they fail. Consider this challenge. Your 1965 Ford Mustang, which you maintain as a collector's item, has been sitting in your garage for 40 years. You monitor it for such items as a clogged carburetor, corrosion in the engine block, battery discharge, etc. and you replace parts when you deem it necessary. But you don't get to start the engine and take it for a test drive. The trick is to assure that if you do need it right away that it would work with certainty. That's what we have to do in a nuclear weapons life extension program (LEP).

By the mid-1990s we had embarked on a program to acquire the new tools of stockpile stewardship—advanced computing, high energy density physics capabilities, modern diagnostics facilities, enhanced surveillance, etc.—that would provide the best available alternative to nuclear tests to assure continued confidence in stockpile safety and reliability. Since then, we have made good progress in acquiring and employing these new capabilities.

In 2001 when this administration took office, it thus inherited:

- A strong science base and surveillance program.
- A safe and reliable, but aging stockpile, with serious questions about the future.
- A plan for warhead life extension (but no new development programs underway).

But, it also inherited a deteriorating or nonfunctioning manufacturing complex characterized by:

- Protracted underfunding
- Idled production capabilities
- Inability to produce plutonium parts
- Inability to produce/extract tritium
- Key facilities not being maintained
- Overly risk averse culture
- Aging workforce

To be fair, some declining production capabilities were not needed at that time to support the stockpile. We were able, after several years delay, to rebuild components for the W87 LEP which commenced in the 1990s and completed in 2004. While we couldn't produce tritium, we didn't need to then because the large reductions in the stockpile at the end of the Cold War ensured adequate tritium reserves for an extended period for remaining warheads. Nonetheless, by not maintaining some key production capabilities, we ran additional risks in terms of not being responsive to unanticipated events.

Despite problems with the production infrastructure, follow-on efforts to the 2001 NPR led to a substantial reduction in the size of the nuclear stockpile. But, because we couldn't produce warheads when and if they were needed—to hedge technical problems in the stockpile or adverse geopolitical changes—we still had to maintain a larger stockpile than desired.

As a result, and in response to the NPR's call for a more responsive defense R&D and manufacturing infrastructure, we began to restore a balance in the overall program by:

- Continuing to fund R&D and aggressive stockpile surveillance,
- Implementing comprehensive stockpile life extension programs, and
- Restoring lost production capabilities and modernizing others as required.

The NPR was instrumental in our receiving additional resources to restore this balance. Indeed, over the past few years we have made substantial progress including initial steps to achieve the Complex 2030 vision for modernizing the nuclear weapons infrastructure. Specifically, we

- Restored tritium production and extraction from irradiated assemblies in TVA reactors,
- Restored key uranium operations at Y–12 in time to meet demanding LEP schedules,
- Recruited/retained strong workforce with the right skills for the mission,
- Are recapitalizing facilities suffering from years of deferred maintenance,
- Are implementing plans to ramp up to an interim plutonium pit production capacity of 30–50 pits per year at Los Alamos by 2012,
- Are reducing the number of sites with Category I/II special nuclear materials (SNM) and consolidating such material within the remaining sites,
- Are dramatically accelerating dismantlement of retired warheads, and
- Are streamlining and improving business practices including managing risk more effectively (e.g., recent success in increasing throughput at our Pantex facility).

But we have a ways to go including defining the right path to restore our ability to produce plutonium components in sufficient quantity to support the long-term needs of the stockpile.

WHY DO WE NEED TO ADJUST THAT STRATEGY AND WHY NOW?

In 2003 we "took stock" of 10 years of the SSP and came to some important conclusions. Let me first reemphasize that the SSP is working—today's stockpile remains safe and reliable and does not require nuclear testing. This assessment is based on a foundation of past nuclear tests augmented by cutting edge scientific and engineering experiments and analysis including improved warhead surveillance. Most importantly, it derives from the professional (and independent) judgment of our lab directors advised by their weapons' program staffs.

As we continue to draw down the stockpile, however, we have become concerned that our current path—successive refurbishments of existing warheads developed during the Cold War and to stringent Cold War specifications—may pose an unacceptable risk to maintaining high confidence in system performance over the long-term.

Specifically, the directors of our national laboratories raised concerns about their ability to assure the reliability of the legacy stockpile over the very long-term absent nuclear testing.

The evolution away from designs certified with underground nuclear tests, resulting from inevitable accumulations of small changes over the extended lives of these highly-optimized systems, is what gives rise to the concerns.

While we are confident that the stockpile stewardship program is working and that today's stockpile is safe and reliable, it is only prudent to explore alternative means to manage risk in seeking to ensure stockpile reliability over the long-term.

This is, in part, the impetus for our work on RRW: to ensure sustainment of the military capabilities provided by the existing stockpile, not develop warheads for new or different military missions.

A second major driver was the realization after September 11 that the security threat to our nuclear warheads had fundamentally changed. The security features in today's stockpile are commensurate with technologies that were available during the Cold War and with the threats from that time. Major enhancements in security are not easily available via retrofits in the legacy stockpile.

Specifically, the RRW program is examining the feasibility of providing replacement warheads for the legacy stockpile. Relaxing Cold War design constraints that sought maximum yield in a minimum size/weight package will allow design of replacements that are easier and less costly to manufacture, are safer and more secure, eliminate environmentally dangerous materials, and increase design performance margins, thus ensuring long-term confidence in reliability.

RRW, therefore, also offers a means to transform to a much more efficient and responsive, much smaller, and, we believe, less costly nuclear weapons R&D and production infrastructure.

In 2005, an RRW design competition was initiated involving two independent teams from our nuclear weapons design labs—Lawrence Livermore and Los Alamos, both working with Sandia. A competition of this sort has not taken place in more than two decades, and the process has provided a unique opportunity to train the next generation of nuclear weapons designers and engineers.

Last November, the joint DOD-DOE Nuclear Weapons Council concluded that RRW was a feasible strategy to sustain the nuclear stockpile over the long term.

In March 2007, the NNSA and DOD jointly announced the results of the design competition. The Lawrence Livermore/Sandia design was selected, and an integrated design team led by those two labs will head up joint efforts to develop a replacement warhead for a portion of the Nation's sea-based nuclear deterrent. I want to emphasize that this announcement addressed selection of a baseline design for RRW in order to develop a detailed cost, scope and schedule; it was not a decision to begin engineering development of a warhead.

The need to start RRW now is driven by two basic reasons. First, the introduction of the RRW system provides the benefit of additional diversity in the Nation's sea-based nuclear force. RRW will replace a portion of W76 warheads deployed on the Trident SLBM system. That particular warhead comprises a very high percentage of our planned future strategic nuclear deterrent force under the Moscow Treaty and an even larger fraction of the force available on a day-to-day basis. Although we have not uncovered any problems with the W76, it is prudent to hedge against a catastrophic failure of that system by introducing a genetically-diverse warhead design into the SLBM force. Our ability over the next 15 years to produce new plutonium parts for the RRW is very limited—the sooner we start the sooner we can achieve this diversity.

Second, the RRW effort has provided a critical opportunity to ensure the transfer of nuclear design skills from the generation that honed these skills with nuclear testing to the generation that will replace them. In 5 years, nearly all of that older generation will be retired or dead. Without this opportunity coming at this time (and not 5 years hence), we would not be able to sustain and transfer the key knowledge and skills necessary to maintain the nuclear stockpile.

Finally, our decision to embark on the path to an RRW does not result from a failure of the stockpile stewardship program, as some have suggested, but is a reflection of its success. The SSP has revealed the need to pursue this approach. Moreover, aggressive pursuit of the new scientific tools currently in use and being developed under the SSP is essential, not only to sustain existing warheads for as long as they are needed, but to our efforts to design, develop and produce replacement warheads that are safer, more secure, more reliable, and cost-effective over the long-term without the need for nuclear testing.

WHERE DO WE WANT TO BE IN 2030?

We seek a Complex 2030 infrastructure that can respond on needed timescales to technical problems in the stockpile or emerging geopolitical threats. Such an infrastructure will provide, sustained long-term confidence in stockpile reliability, enhanced stockpile safety and security, a smaller stockpile with reduced likelihood of requiring future underground nuclear tests, excellence in weapons-related science and R&D, a modernized, fully capable, warhead manufacturing facilities with a production capacity of about 100 warheads per year (not the 2,000 warheads per year capacity we had during the Cold War), and periodic exercise of key nuclear design capabilities that have lain dormant for two decades.

With such an infrastructure we believe that we can achieve reduced DOE and DOD ownership costs for nuclear forces over the long term. A smaller stockpile means a lower overall cost to certify, remanufacture, refurbish, and dismantle warheads. A complex in which we consolidate nuclear materials in fewer locations will help contain ever-increasing resources devoted, post-September 11, to physical security. Finally, we will continue to reduce costs by more efficient business practices, including better management of the safety and security risks inherent to our work.

HOW IS OUR RRW STRATEGY CONSISTENT WITH NONPROLIFERATION AND ARMS CONTROL?

The RRW strategy itself has positive implications for nonproliferation.

These warheads, by design, will not provide a new role for nuclear weapons or new military capabilities but will help sustain the military capabilities of the existing nuclear arsenal.

Because these warheads would be designed with more favorable performance margins, and be less sensitive to incremental aging effects, they would reduce the possibility that the United States would ever be faced with a need to conduct a nuclear test to diagnose or remedy a stockpile reliability problem. This supports overall U.S. efforts to dissuade other nations from conducting nuclear tests.

In fielding RRWs, we will not be increasing the size of the stockpile. These warheads will replace existing warheads on at most a one-for-one basis.

Once a transformed production complex demonstrates that it can produce replacement warheads on a timescale in which geopolitical threats could emerge or respond in a timely way to technical problems in the stockpile, then we can go much further in eliminating spare warheads—further reducing the nuclear stockpile and, along with a host of other activities, demonstrating our commitment to Article VI of the Nonproliferation Treaty (NPT).

Our near-term strategy also includes an increased rate for dismantling warheads that are retired from the stockpile. Warhead dismantlements ensure that stockpile and infrastructure transformation is not misperceived by other nations as "restarting the arms race."

A safe, secure and reliable U.S. nuclear deterrent, credibly extended to allies, supports U.S. nonproliferation policy because allies that are confident in U.S. extended nuclear deterrence guarantees will not be motivated to develop and field their own nuclear forces. This nonproliferation role of U.S. nuclear weapons is often underestimated.

Finally, we should not forget that the human capital and technical expertise built up over decades to support nuclear weapons programs are the same resources that support nonproliferation, arms control and threat reduction efforts. The linkages and synergies among these programs enhance overall security.

CONCLUSION

Let me conclude by summarizing my basic message:

- To meet its own security needs and those of its allies, the United States will need a safe, secure, and reliable nuclear deterrent for the foreseeable future. We will achieve this with the smallest nuclear stockpile consistent with our Nation's security.
- We see increased risk, absent nuclear testing, in assuring the long-term reliability of today's stockpile—i.e., the legacy warheads left over from the Cold War—that undergo a continuous process of aging, and refurbishment of aging components, and consequently accumulate small changes away from the original tested and certified designs.
- Today's nuclear weapons complex is not sufficiently "responsive" to technical problems in the stockpile or to possible adverse geopolitical change.
- Our task is to work to ensure that the U.S. nuclear weapons enterprise, including the stockpile and supporting infrastructure, meets long-term national security needs.
- Our approach is to develop and field replacement warheads for the legacy stockpile as a means to transform both the nuclear stockpile and supporting infrastructure.
- These warheads will have enhanced safety and security features.
- We intend to accomplish all of this in a manner fully consistent with our obligations under the NPT and without requiring underground nuclear tests.

I am confident that NNSA is headed in the right direction in the coming fiscal year. The budget request will support continuing our progress in protecting and certifying our Nation's strategic deterrent, transforming our nuclear weapons stockpile and infrastructure, reducing the global danger from proliferation and WMD, and enhancing the force projection capabilities of the U.S. nuclear Navy. It will enable us to continue to maintain the safety and security of our people, information, materials, and infrastructure. Taken together, each aspect of this budget request will allow us to meet our national security responsibilities during the upcoming fiscal year and well into the future.

Our fiscal year 2008 budget request for weapons activities follows along with a statistical appendix that contains the budget figures supporting our request. I look forward to answering any questions on the justification for the requested budget.

ATTACHMENT

FY 2008 BUDGET REQUEST FOR WEAPONS PROGRAM ACTIVITIES

The President's FY 2008 Budget Request for NNSA totals $9.4 billion, an increase of $306 million or 3.4 percent over the FY 2007 operating plan. We are managing our program activities within a disciplined five-year budget and planning envelope, and are successfully balancing the Administration's high priority initiatives to reduce global nuclear danger as well as future planning for the Nation's nuclear weapons complex within an overall modest growth rate.

The NNSA budget justification contains information for five years as required by Sec. 3253 of P.L. 106-065. This section, entitled *Future-Years Nuclear Security Program*, requires the Administrator to submit to Congress each year the estimated expenditures necessary to support the programs, projects and activities of the NNSA for a five-year fiscal period, in a level of detail comparable to that contained in the budget.

The FY 2008-2012 Future Years Nuclear Security Program -- FYNSP -- projects $50.0 billion for NNSA programs though 2012. This is an increase of about $1.5 billion over last year's projections in line with the Administration's strong commitment to the Nation's defense and homeland security. The FY 2008 request is slightly smaller than last year's projection; however, the outyears are increased starting in 2009. Within these amounts, there is significant growth projected for the Defense Nuclear Nonproliferation programs to support homeland security, including new initiatives and acceleration of threat reduction programs and increased inspection of seagoing cargoes destined for ports in the United States.

Weapons Program Activities

The FY 2008 Budget Request for the programs funded within the Weapons Activities Appropriation is $6.51 billion, an approximately 3.8 percent increase over the FY 2007 operating plan. It is allocated to adequately provide for the safety, security, and reliability of the nuclear weapons stockpile and supporting facilities and capabilities.

This request supports the requirements of the SSP consistent with the Administration's NPR and subsequent amendments, and the revised stockpile plan submitted to the Congress in June 2004. Our request places a high priority on accomplishing the near-term workload and supporting technologies for the stockpile along with the long-term science and technology investments to ensure the design and production capability and capacity to support ongoing missions. This request also supports the facilities and infrastructure that must be modernized to be responsive to new or emerging threats.

The Department has made significant strides over the past year to transform the nuclear weapons complex. The "Complex 2030" planning scenario was introduced in 2006 and has already resulted in a number of accomplishments. We have not created a separate budget line for our transformational activities in the FY 2008 President's Request. Implementation actions to bring about transformation are incorporated into existing program elements: Directed Stockpile Work

(DSW), Campaigns, Readiness in Technical Base and Facilities (RTBF), and Secure Transportation Asset. The approach to transformation relies extensively on existing line program organizations taking responsibility for individual actions required to change both the stockpile and its supporting infrastructure. While the Administration continues to assess the plans and funding projections for certain elements of NNSA's complex transformation strategy, this budget contains resources to support a number of transformational initiatives underway within our base program activities.

In FY 2008, we are requesting $1.45 billion for DSW, an increase of $21.5 million over the FY 2007 operating plan. We will continue an aggressive dismantlement plan for retired warheads and consolidation of special nuclear material across the nuclear weapons complex. Both of these efforts will contribute to increasing the overall security at NNSA sites. In FY 2007, funding was increased to cover upfront costs associated with tooling procurement, procedure development, Safety Authorization Basis work, hiring of production technicians, and equipment purchases, which will support future-year dismantlement rates. The FY 2008 request reflects the required funding to support the planned dismantlement rates reported to Congress. Funding at higher levels was unnecessary once the dismantlement process was improved with FY 2005 and FY 2006 funding. In May 2006, the NWC directed that the W80 LEP be deferred to support NNSA efforts to transform the nuclear weapons complex and continue work on a RRW. At the same time, the B61 and W76 LEP workloads are increasing, since they both will have entered the production phase by FY 2008. DSW also supports routine maintenance and repair of the stockpile and supports managing the strategy, driving the change, and performing the crosscutting initiatives required to achieve responsiveness objectives envisioned in the NPR. Our focus remains on the stockpile, to ensure that the nuclear warheads and bombs in the U.S. nuclear weapons stockpile are safe, secure, and reliable.

Progress in other elements of the SSP continues. The FY 2008 request for the six Campaigns is $1.87 billion, a $113 million decrease from the FY 2007 operating plan. The decrease in program funding is required to balance overall weapon activity priorities, specifically the transition of the W76 LEP from R&D to production, the consolidation of computing facilities, and a large decrease in Readiness Campaign activities associated in part to the transition of Tritium Extraction Facility to full operations. The Campaigns focus on scientific and technical efforts and capabilities essential for assessment, certification, maintenance, and life extension of the stockpile and have allowed NNSA to continue "science-based" stockpile stewardship. These Campaigns are evidence of NNSA's excellence and innovation in science, engineering and computing that, though focused on the nuclear weapons mission, have broader application and value. The use of DOE Office of Science facilities in supporting Stockpile Stewardship science and engineering will increase modestly at the same time that access to NNSA's science facilities is extended to a broader community of users.

Specifically, $425.8 million for the Science and Engineering Campaigns provides the basic scientific understanding and the technologies required to support DSW and the completion of new scientific and experimental facilities in the absence of nuclear testing.

The Readiness Campaign, with a request of $161.2 million, develops and delivers design-to-manufacture capabilities to meet the evolving and urgent needs of the stockpile and supports the

transformation of the nuclear weapons complex into an agile and more responsive enterprise. In February 2007, startup of the Tritium Extraction Facility at the Savannah River Site was completed, making possible the use of new tritium in the U.S. stockpile for the first time in 18 years.

The Advanced Simulation and Computing (ASC) Campaign is a key example of NNSA excellence and innovation in science and engineering, establishing world leadership in computational simulation sciences with broad application to national security. The request of $585.7 million for the ASC Campaign supports the development of computational tools and technologies necessary to support the continued assessment and certification of the refurbished weapons, aging weapons components, and the RRW program without underground nuclear testing. As we enhance and validate the predictive science capabilities embodied in these tools, using the historical test base of more than 1,000 Cold War era nuclear tests to computer simulations, we can continue to assess the stockpile to ensure that it is safe, secure, and reliable.

The $412.3 million request for the Inertial Confinement Fusion Ignition and High Yield Campaign is focused on the execution of the first ignition experiment at the National Ignition Facility (NIF) in 2010, and provides facilities and capabilities for high-energy-density physics experiments in support of the SSP. To achieve the ignition milestone, $147 million will support construction of NIF and the NIF Demonstration Program and $232.2 million will support the National Ignition Campaign. The ability of NIF to assess the thermonuclear burn regime in nuclear weapons via ignition experiments is of particular importance. NIF will be the only facility capable of probing in the laboratory the extreme conditions of density and temperature found in exploding nuclear weapons.

NIF will join the Z pulsed-power machine at Sandia National Laboratories and the Omega Laser at University of the Rochester's Laboratory for Laser Energetics as world leading facilities in providing quantitative measurements that close important gaps in understanding nuclear weapons performance. NIF, Omega, and Z are complementary in their capabilities, allowing scientists from both inside and outside the nuclear weapons complex to contribute to a better understanding of the high energy density physics of nuclear warheads. NIF will provide the only access in the world to thermonuclear ignition conditions and the Omega laser with its symmetric illumination and very high repetition rate provides a large amount of quantitative information. The Z facility is especially suited for accurate measurement of materials properties that are crucial to weapons performance. These facilities will be operated as national user facilities in order to obtain the best return on investment and maximum contribution to the Stockpile Stewardship mission.

The Pit Manufacturing and Certification Campaign request of $281 million builds on the success of manufacturing and certifying a new W88 pit in 2007 and addresses issues associated with manufacturing future pit types including the RRW and increasing pit production capacity at LANL. There are plans to increase pit production capacity at LANL to meet national security needs. LANL is not only an interim capability for pit manufacturing at the present time, but it serves as the United States' sole capability. We continue to be the only nuclear weapon state without a true manufacturing capability.

Readiness in Technical Base and Facilities (RTBF) and Facilities and Infrastructure Recapitalization Program (FIRP)

In FY 2008, we are requesting $1.96 billion for the maintenance and operation of existing facilities, remediation and disposition of excess facilities, and construction of new facilities. Of this amount, $1.66 billion is requested for RTBF, an increase of $49 million from the FY 2007 operating plan, with $1.36 billion reserved for Operations and Maintenance and $307 million for RTBF Construction. Some new facility construction (e.g., NIF, MESA, TEF, and DARHT) is budgeted in applicable Campaigns.

This request also includes $293.7 million for the Facilities and Infrastructure Recapitalization Program (FIRP), a separate and distinct program that is complementary to the ongoing RTBF efforts. The FIRP mission is to restore, rebuild and revitalize the physical infrastructure of the nuclear weapons complex, in partnership with RTBF. This program assures that facilities and infrastructure are restored to an appropriate condition to support the mission, and to institutionalize responsible and accountable facility management practices. In response to NNSA's request, Congress extended the FIRP end date from 2011 to 2013 to enable successful completion of the FIRP mission. The Integrated Prioritized Project List (IPPL) is the vehicle that the FIRP program will rely on to prioritize and fund outyear projects to reduce legacy deferred maintenance. These projects significantly reduce the deferred maintenance backlog to acceptable levels and support the SSP mission and transformation of the complex.

These activities are critical for the development of a more responsive infrastructure and will be guided by decisions resulting from the Complex 2030 Supplemental Programmatic Environmental Impact Statement and the National Environmental Policy Act (NEPA) process. Since a significant fraction of our production capability resides in World War II era facilities, infrastructure modernization, consolidation, and sizing consistent with future needs is essential for an economically sustainable Complex. Facilities designed according to modern manufacturing, safety, and security principles will be more cost-effective and responsive to a changing future. For example, a facility could be designed to support a low baseline capacity and preserve the option, with a limited amount of contingent space, to augment capacity if authorized and needed to respond to future risks.

Having a reliable plutonium capability is a major objective of NNSA planning. Options for plutonium research, surveillance, and pit production are being evaluated as part of the Complex 2030 NEPA process with a Record of Decision anticipated in 2008. The baseline Complex 2030 planning scenario relies on Los Alamos National Laboratory facilities at Technical Area 55 to provide interim plutonium capabilities until a consolidated, long-term capability can be established. This interim strategy relies on the proposed Chemistry and Metallurgy Research Replacement – Nuclear Facility (CMRR-NF) to achieve all the objectives of (1) closing the existing Chemistry and Metallurgy Research (CMR) facility, (2) replacing essential plutonium capabilities currently at Lawrence Livermore National Laboratory, and (3) achieving a net manufacturing capacity of 50 pits per year. However, the increasing cost of the CMRR-NF and the need to ensure that near- and long-term planning for plutonium facilities are integrated requires that we complete our Complex 2030 decision process before committing to construction

of the CMRR-NF. Since the CMRR Radiological Laboratory, Utility, and Office Building (CMRR-RLUOB) is required under all scenarios, this project will proceed as planned.

The Highly Enriched Uranium Materials Facility (HEUMF) and the proposed Uranium Processing Facility (UPF) will allow a reduction of the high security area at the Y-12 National Security Complex from 150 acres to 15 acres. This reduction will combine with the engineered security features of the two structures to meet the DBT at significantly reduced costs, to lower non-security costs, and to provide a responsive highly enriched uranium manufacturing capability. UPF planning is consistent with the timing of decisions from the Complex 2030 PEIS process.

Secure Transportation Asset

In FY 2008, the Budget Request includes $215.6 million for Secure Transportation Asset (STA) Program, an increase of $6 million from the FY 2007 operating plan, for meeting the Department's transportation requirements for nuclear weapons, components, and special nuclear materials shipments. The workload requirements for this program will escalate significantly in the future to support the dismantlement and maintenance schedule for the nuclear weapons stockpile and the Secretarial Initiative to consolidate the storage of nuclear material. The challenge to increase secure transport capacity is coupled with and impacted by increasingly complex national security concerns. To support the escalating workload while maintaining the safety and security of shipments, STA is increasing the number of SafeGuards Transporters (SGT) in operation by two per year, with a target total of 51 in FY 2014. Due to resource constraints, SGT production has been slowed from three to two per year, extending the original 2011 endpoint target date.

Environmental Projects and Operations

The Environmental Projects and Operations/Long-Term Stewardship Program is requested at $17.5 million in FY 2008. This program serves to reduce the risks to human health and the environment at NNSA sites and adjacent areas by: operating and maintaining environmental clean-up systems; performing long-term environmental monitoring activities; and, integrating a responsible environmental stewardship program with the NNSA mission activities.

Nuclear Weapons Incident Response

The Nuclear Weapons Incident Response (NWIR) Program responds to and mitigates nuclear and radiological incidents worldwide as the United States Government's primary capability for radiological and nuclear emergency response. The FY 2008 Request for these activities is $161.7 million, of which $28 million is reserved for the implementation of two new initiatives that will strengthen the Nation's emergency response capabilities - the National Technical Nuclear Forensics (NTNF) and the Stabilization Implementation programs.

The National Technical Nuclear Forensics Program will establish a DOE capability to support post-detonation activities and enhance DOE Technical Nuclear Forensics capabilities. The development of this capability will facilitate the thorough analysis and characterization of pre-

and post-detonation radiological and nuclear materials and devices as well as prompt signals from a nuclear detonation. Developing forensic capabilities of this nature is crucial to the overall objective of nuclear material or device attribution.

Stabilization is a new concept and a new capability aimed at using advanced technologies to enhance the U.S. Government's ability to interdict, delay and/or prevent operation of a terrorist's radiological or nuclear device until national assets arrive on the scene to conduct traditional "render safe" procedures. NNSA has actively sponsored new research in this area and, additionally, is leveraging emerging technologies that have been demonstrated successfully by the DoD in support of the global war on terrorism. In the implementation phase, NNSA will transfer these matured projects into operational testing, potentially followed by their transition into the collection of tools available to Federal response teams.

Safeguards and Security

The FY 2008 Request for Defense Nuclear Security is $744.8 million, an increase of $121 million above the FY 2007 operating plan. This increase will accommodate the increased cost of sustaining the implementation of the 2003 DBT and the phased implementation of the 2005 DBT in 2008 and the outyears. Full implementation of the 2005 DBT will occur at: the Pantex Plant in FY 2008; Lawrence Livermore National Laboratory in FY 2008; the Nevada Test Site in FY 2009; the Y-12 National Security Complex in FY 2011; and, LANL in FY 2011. During FY 2008, the program's efforts will largely be focused on eliminating or mitigating identified vulnerabilities across the nuclear weapons complex by bolstering protective force training, acquiring updated weapons and support equipment, improving physical barrier systems and standoff distances, and reducing the number of locations with "targets of interest." Physical security systems will be upgraded and deployed to enhance detection and assessment, add delay and denial capabilities, and to improve perimeter defenses at several key sites.

The FY 2008 Request for Cyber Security is $102.2 million is focused on sustaining the NNSA infrastructure and upgrading elements designed to counter cyber threats and vulnerabilities from external and internal attacks. This funding level will support cyber security revitalization, identify emerging issues, including research needs related to computer security, privacy, and cryptography. Additionally, the funding will provide for enhancement, certification, and accreditation of unclassified and classified systems to ensure proper documentation of risks and justification of associated operations for systems at all sites. The funding within this Request will also be applied to foster greater cyber security awareness among Federal and contractor personnel. NNSA will sponsor a wide range of educational initiatives to ensure that our workforce possess the ever-expanding cyber security skills critical to safeguarding our national security information. Funding provided to NNSA sites will be conditioned upon their implementation of a risk-based approach to cyber security.

National Nuclear Security Administration

Appropriation and Program Summary Tables
Outyear Appropriation Summary Tables

FY 2008 BUDGET TABLES

National Nuclear Security Administration
Appropriation and Program Summary

(dollars in millions)

	FY 2006 Current Appropriations	FY 2007 Operating Plan	FY 2008 Request
National Nuclear Security Administration (NNSA)			
Office of the Administrator	354.2	340.3	394.7
Weapons Activities (after S&S WFO offset)	6,355.3	6,275.6	6,511.3
Defense Nuclear Nonproliferation	1,619.2	1,683.3	1,672.6
Naval Reactors	781.6	781.8	808.2
Total, NNSA	9,110.3	9,081	9,386.8

NOTE: The FY 2006 column includes an across-the-board rescission of 1 percent in accordance with the Department of Defense Appropriations Act, 2006, P.L. 109-148.

The NNSA budget justification contains information for five years as required by Sec. 3253 of P.L. 106-065. This section, entitled *Future-Years Nuclear Security Program (FYNSP)*, requires the Administrator to submit to Congress each year the estimated expenditures necessary to support the programs, projects and activities of the NNSA for a five-year fiscal period, in a level of detail comparable to that contained in the budget.

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

(dollars in millions)

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
NNSA					
Office of the Administrator	395	405	415	425	436
Weapons Activities (after S&S offset)	6,511	6,705	6,904	7,111	7,324
Defense Nuclear Nonproliferation	1,673	1,798	1,845	1,893	1,942
Naval Reactors	808	828	849	870	892
Total, NNSA	9,387	9,736	10,013	10,299	10,594

Weapons Activities

Funding Profile by Subprogram

	(dollars in thousands)		
	FY 2006 Current Appropriation	FY 2007 Operating Plan	FY 2008 Request
Weapons Activities			
Directed Stockpile Work	1,372,327	1,425,722	1,447,236
Science Campaign	276,670	270,458	273,075
Engineering Campaign	247,907	162,786	152,749
Inertial Confinement Fusion Ignition and High Yield Campaign	543,582	489,706	412,259
Advanced Simulation and Computing Campaign	599,772	611,973	585,738
Pit Manufacturing and Certification Campaign	238,663	242,392	281,230
Readiness Campaign	216,567	201,713	161,169
Readiness in Technical Base and Facilities	1,654,840	1,613,241	1,662,144
Secure Transportation Asset	209,979	209,537	215,646
Nuclear Weapons Incident Response	117,608	133,514	161,748
Facilities and Infrastructure Recapitalization Program	149,365	169,383	293,743
Environmental Projects and Operations	0	0	17,518
Safeguards and Security	797,751	761,158	881,057
Other	0	17,000	0
Subtotal, Weapons Activities	**6,425,031**	**6,308,583**	**6,545,312**
Use of Prior Year Balances			
Security Charge for Reimbursable Work	-32,000	-33,000	-34,000
Use of Prior Year Balances	-37,734	0	0
Total, Weapons Activities	**6,355,297**	**6,275,583**	**6,511,312**

Public Law Authorization:

John Warner National Defense Authorization Act for FY 2007 (P.L. 109-364)

Outyear Funding Profile by Subprogram

	(dollars in thousands)			
	FY 2009	FY 2010	FY 2011	FY 2012
Weapons Activities				
Directed Stockpile Work	1,483,417	1,520,502	1,558,515	1,597,478
Science Campaign	282,741	275,622	270,390	275,626
Engineering Campaign	147,090	144,448	142,614	145,417
Inertial Confinement Fusion Ignition and High Yield Campaign	406,098	413,186	411,851	407,487
Advanced Simulation and Computing Campaign	598,241	583,643	570,873	582,243
Pit Manufacturing and Certification Campaign	291,945	339,462	357,622	347,269
Readiness Campaign	190,477	184,703	180,357	183,946
Readiness in Technical Base and Facilities	1,698,403	1,765,458	1,862,729	1,952,633
Secure Transportation Asset	228,300	237,749	253,037	262,118
Nuclear Weapons Incident Response	169,835	178,327	187,243	196,605
Facilities and Infrastructure Recapitalization Program	286,572	297,096	304,330	312,000
Environmental Projects and Operations	32,471	29,923	30,864	31,574
Safeguards and Security	924,410	969,881	1,017,575	1,067,604
Subtotal, Weapons Activities	**6,740,000**	**6,940,000**	**7,148,000**	**7,362,000**
Security Charge for Reimbursable Work	-35,000	-36,000	-37,000	-38,000
Total, Weapons Activities	**6,705,000**	**6,904,000**	**7,111,000**	**7,324,000**

Senator BILL NELSON. General?

STATEMENT OF MAJ. GEN. ROGER BURG, USAF, DIRECTOR OF STRATEGIC SECURITY IN THE AIR, SPACE, AND INFORMATION OPERATIONS, HEADQUARTERS, UNITED STATES AIR FORCE

General BURG. Thank you, Senator. It is a pleasure to be here representing the Air Force.

You can see in our budget submission this year that there is a lot of attention paid to strategic forces. There is modernization efforts in the bomber force, in the ICBM force, with reductions being taken in both at the same time. You will see a significant amount of money applied to programs that might lead to a conventional strike capability to support General Cartwright's capability gap for prompt global strike. You will see some very significant reductions in the overall nuclear force, this year principally in the cruise missile area of our nuclear force.

I will open with that and I am happy to answer any questions or discuss any aspects of that with the committee.

[The prepared statement of General Burg follows:]

PREPARED STATEMENT BY MAJ. GEN. ROGER BURG, USAF

I. INTRODUCTION

Mr. Chairman and distinguished members of the subcommittee, thank you for the opportunity to appear before you today to discuss our Strategic Nuclear posture.

Your Air Force is fully engaged around the world fighting terrorism and insurgents in the global war on terror and fulfilling our roles as airmen for the joint team. Simultaneously, we stand prepared for rapid response to conflict around the globe as our Nation's Strategic Reserve. Air forces succeed when they anticipate and are allowed to shape the future strategic environment and develop the capabilities for the next fight. Air forces succeed when they remain focused on their primary mission as an independent force that is part of an interdependent joint team. We fly, fight, and dominate in three warfighting domains—air, space, and cyberspace—giving our Nation sovereign options to employ military force like no other nation.

II. WE ARE AT WAR

Supporting U.S. Central Command and the global war on terror is just a portion part of what your Air Force does for our Nation's defense. Your Air Force has responded (or been prepared to respond) across the entire spectrum of conflict—from rapid humanitarian aid to major combat operations.

Fighting and winning the global war on terror is our number one priority; however, it is important that we maintain focus on protecting our Nation from other potential enemies, both traditional and nontraditional. Currently, your Air Force has over 27,000 airmen, or about 5 percent of the Total Force deployed in support of global operations. We also have approximately 213,000 personnel, or about 40 percent of the total force, on-line supporting the combatant commands (COCOMs) daily. This number includes airmen supporting Intercontinental Ballistic Missiles (ICBMs), missile warning and space control, the satellite control network, strategic bombers, Special Operations, and combat search and rescue forces. It also includes steady-state rotational forces performing a global mission but not necessarily under the direct control of a COCOM Commander or assigned to a particular area of operation. Examples include Air Expeditionary Force (AEF) postured continental U.S. fighters and theater airlift forces, base-level support troops, Air Force Major Command staffs, forces outside the continental U.S. assigned to Pacific Air Forces and U.S. Air Forces in Europe, global support, and strategic forces. Clearly airmen needn't be deployed to be employed.

Today's strategic forces deliver uncompromising defense to our Nation, no differently than they have accomplished for 60 years. Since the beginnings of the Cold War, airmen continue to stand silent sentry around the clock to protect and defend our national security, and respond to any adversary should deterrence fail.

III. STRATEGIC NUCLEAR FORCES

Air Force Intercontinental Ballistic Missiles

As the Secretary of the Air Force stated in his response to concerns regarding the Minuteman III (MMIII) force reduction, "the ICBM force has provided a rapid-reaction nuclear deterrent capability since the 1960s. Today, the MMIII is the Nation's only operational ICBM." During the 2005 Quadrennial Defense Review (QDR), the Defense Department agreed with U.S. Strategic Command (USSTRATCOM) recommendation to reduce the ICBM force from 500 to 450.

The National Defense Authorization Act (NDAA) for Fiscal Year 2007 mandated that the Air Force modernize MMIII ICBMs in the United States inventory as required to maintain a sufficient supply of launch test assets and spares to sustain the deployed force of such missiles through 2030. The Air Force has ongoing Life Extension Programs designed to extend ICBM service life beyond 2020. Additionally, the Air Force is currently analyzing MMIII missile and ground systems to determine what activities are required to sustain the force through 2030.

The Air Force plans to use an incremental approach to field an ICBM follow-on system that will address aging components while supporting COCOM requirements. The Office of the Secretary of Defense Land-Based Strategic Deterrent Overarching Integrated Product Team will review an initial system assessment in August 2007. The USAF Land-Based Strategic Deterrent Initiative will be addressed in the fiscal year 2010 Program Objective Memorandum (POM). The AF will complete the concept refinement and pre-Milestone A activities this year.

ICBM Demonstration Validation

Responsive infrastructure is a key component of the New Triad and serves as a backstop that allows us to reduce the nuclear arsenal without compromising our

strategic deterrent posture. A comprehensive and aggressive demonstration validation program adds to the deterrent value of the force. The ICBM Demonstration Validation Program is at the core of our efforts to preserve our ballistic missile capability. It allows us to respond to emerging issues in the Minuteman fleet while identifying methods to reduce life-cycle costs and improve nuclear safety and surety. The unique capabilities exercised by this Program are essential to keep the Minuteman weapon system operationally viable through 2030.

ICBM Life Extension Programs (LEPs)

The MMIII ICBM is undergoing major LEPs of components from the nozzle to the nose-tip, extending MM III service life through 2020 and beyond. All programs are currently on budget and on schedule. Modifications include:

1. Guidance Replacement Program: Replaces guidance set electronics on MMIII and improves reliability on the ground and in flight. A total of 440 sets have been delivered and the program will be complete with the delivery of the final 32 guidance sets in fiscal year 2007.
2. Propulsion Replacement Program: Extends booster life through 2020 by re-pouring stages one and two, and re-manufacturing stage three. A total of 311 boosters have been delivered. The program will be complete with the delivery of the final 56 booster sets in fiscal year 2008.
3. Propulsion System Rocket Engine Program: Refurbishes seven components and assemblies in the liquid propulsion post-boost vehicle. A total of 72 kits have been installed and we will purchase 96 additional kits in fiscal year 2008.
4. Safety Enhanced Reentry Vehicle: Enables MMIII to carry the more advanced Peacekeeper MK 21 Reentry Vehicle (RV) while retaining the powerful MMIII MK 12A RV multiple independently re-targetable RV (MIRV) capability. Retirement of the older MK 12 RV is now possible, allowing us to avoid a costly $1 billion LEP. A total of 20 kits have been installed and we will purchase an additional 120 kits in fiscal year 2008.
5. Environmental Control System: Modernizes cooling system equipment in the Minuteman Launch Facilities and Missile Alert Facilities. Five kits have been installed and we will purchase 112 kits in fiscal year 2008. We are not planning to modify the facilities assigned to the 564th Missile Squadron at Malmstrom Air Force Base (AFB), MT as a result of the planned reduction in the MMIII ICBM force.
6. ICBM Security Modernization Program: This three-part program consists of concrete enhancements, a fast-rising secondary personnel access hatch, and a Remote Visual Assessment (RVA) camera. This comprehensive program began in fiscal year 2004. Our fiscal year 2008 program includes the purchase of 100 fast-rising hatches which will allow responding Security Forces adequate time to deny access to our launch facilities. Our fiscal year 2008 program also purchases 60 RVA units. We are not planning to modify facilities assigned to the 564th Missile Squadron at Malmstrom AFB, MT as a result of the planned reduction in the MMIII ICBM force.

Helicopters

The primary Air Force Space Command (AFSPC) helicopter mission is to provide our security forces with a continuous contingency response capability for the national ICBM complex. However, the Bell UH–1N is not capable of meeting current security requirements. It does not meet Key Performance Parameters for speed, endurance, range, or payload. UH–1Ns are not armed with offensive weapons, have no defensive capabilities or countermeasures, and cannot operate in a chemical, biological, radiological, nuclear (CBRN) environment.

Our average Air Force UH–1N airframe is 38 years old. The original design life for this aircraft was 2,500 flying hours, although some aircraft in the inventory have over 13,000 hours. The UH–1N fleet is showing its age with fatigue-related cracks in the tail boom and is currently undergoing its second tail boom replacement enabling it to meet flight safety standards.

The Common Vertical Lift Support Platform (CVLSP) is an Air Force effort to replace the UH–1N. The CVLSP was originally envisioned as a variant of CSAR–X. The Joint Requirements Oversight Council directed that the efforts be separated and then directed AFSPC to conduct a separate CVLSP Analysis of Alternatives (AoA). The CVLSP AoA is now complete and is in coordination at the Air Staff. CVLSP is sixth on the Air Force's Unfunded Priority List.

The AFSPC team is considering four CVLSP options:

1. CSAR–X platform

2. Rebuild Air Combat Command service life extension program-modified HH–60G aircraft
3. Develop a new aircraft
4. Continue using the UH–1N aircraft

Nuclear Cruise Missiles

The Air Force analyzed current and future roles for nuclear cruise missiles during the 2005 QDR and the fiscal year 2007 Amended POM (APOM). The Defense Department issued guidance on 20 December 2005 directing USSTRATCOM and the Air Force to study the nuclear cruise missile force structure, including the Air-to-Ground Missile (AGM) –86 Air Launched Cruise Missile (ALCM) and the AGM–129 Advanced Cruise Missile (ACM). The guidance also directed us to build a retirement schedule for the missiles.

The resulting study recommended that the Air Force retire all ACMs, reduce the ALCM force to 528, retire all excess ALCMs, consolidate the ALCM force at Minot AFB, and retain ALCMs in the inventory through at least 2020, possibly 2030. On 12 April 2006, the Deputy Secretary of Defense accepted the study recommendations. On 23 June 2006, the Commander, USSTRATCOM sent a letter to the Secretary of Defense supporting the study findings and advocating adoption of the ALCM/ACM force structure recommendations. The Joint Chiefs of Staff and National Security Council endorsed most of the study recommendations. On 17 October 2006 the Secretary of Defense directed the Air Force to retire the ACM and reduce the ALCM fleet to 528 missiles.

The Air Force intends to remove from service, demilitarize and destroy all ACMs and the excess ALCM missile bodies. The remaining nuclear cruise missile force will be consolidated at Minot AFB, North Dakota. As of this date, the Air Force has taken no irreversible actions as it seeks final congressional approval to demilitarize and destroy these missile bodies. These cruise missile force structure changes are part of a balanced force reduction that supports both Presidential direction to reduce the active nuclear stockpile, as well as the United States' obligation under the 2002 Moscow Treaty to reduce the number of operationally deployed strategic nuclear warheads to 1,700–2,200 warheads.

Strategic Bombers

We have no plans to change the current force of B–1 and B–2 aircraft. Our strategy for the future bomber fleet includes a three-phased modernization plan. The first phase of the modernization strategy includes plans for us to divest 38 B–52s while modernizing the remaining legacy systems. President's budget fiscal year 2008 funded a B–52 force structure consisting of 56 B–52 Total Aircraft Inventory (TAI). This inventory included 32 Combat Coded (CC), 11 Training (TF), 4 test, and 9 backup B–52s. Following submission of the fiscal year 2008 POM to the Office of the Secretary of Defense, Congress mandated that the Air Force "not retire more than 18 B–52s (fiscal year 2007 retirements) and maintain 44 B–52s as Combat Coded." The Headquarters Air Force, Air Combat Command (ACC), and the Air Force Reserve Center are working together to abide by this restriction while meeting the Air Force need to recapitalize aging aircraft. ACC is finalizing a plan to recode 11 TF B–52s and 2 test B–52 which would result in a total of 44 combat coded B–52s. The 20 B–52s the Air Force plans to retire in fiscal year 2008 will be stored on the ramps at Barksdale AFB and Minot AFB in XJ status, which means that the Air Force will keep these aircraft in a serviceable condition but not in a common configuration (i.e. no capability upgrades) with the other 56 aircraft.

The fiscal year 2008 President's budget reflects the Air Force position. A fleet of 56 TAI B–52s with 32 coded for combat meets Air Force requirements while supporting the need to recapitalize. The NDAA for Fiscal Year 2007 mandated that no funds "be obligated or expended for retiring any of the 93 B–52H bomber aircraft in service in the Air Force as of the date of the enactment of this act until 45 days after the date on which the Secretary of the Air Force submits a Bomber force structure report prepared by the Institute for Defense Analyses." The Air Force expects the report to be finished by the end of 2007.

The second and third phases of the modernization strategy include fielding a next-generation long-range strike capability by 2018 and fielding an advanced technology system with increased speed, range, precision, connectivity and survivability by 2035.

Reliable Replacement Warhead

Reliable Replacement Warhead (RRW) designs incorporate a broad suite of enhanced safety features which increases efficiency and cost-effectiveness as well as improved security features to prevent unauthorized use by terrorists, rogue nations or criminal organizations. These designs will replace 1970s-era technologies with

modern components which will help minimize future safety and security uncertainties and can be managed using the improved computational and experimental tools developed by the Stockpile Surveillance Program. An all-RRW force is sustainable well into the future providing our combatant commanders with high confidence while managing risk.

In November 2006 the Nuclear Weapons Council commissioned an RRW–2 Phase 1 Study. The purpose of the year-long study is to define concepts for a replacement warhead to existing and future air-delivered systems. The study group is analyzing preliminary concept assessments, identifying delivery systems, recommending nuclear weapon trade-offs, and proposing an initial program schedule.

IV. CLOSING

We are building an Air Force prepared to dominate in the 21st century—strategically, operationally, and tactically. Air Force Strategic forces, the bulwark of our strategic deterrent capability, give us the means to ensure Global Vigilance, Global Reach, Global Power, and worldwide Expeditionary Combat Support. These capabilities are essential to the joint fight and are a critical component of the future joint force. The Air Force is committed to advancing strategic capabilities to fully support the joint team. In order to maintain our strategic dominance, the Air Force must recapitalize and also be allowed to divest itself of outdated, excess platforms. Divesting excess platforms will provide the means to shift vital funds to recapitalization and modernization of our Air Force and to maintain a strategic deterrent second to none. We appreciate your continued support in turning our vision into an operational reality. Our nation must invest today to ensure tomorrow's air, space, and cyberspace dominance.

Senator BILL NELSON. Thank you.

Admiral?

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

Admiral JOHNSON. Good morning, Senator. It is a privilege to be here with you today representing the sailors and the marines and the men and women of the Strategic Systems Programs. Our biggest priority in the budget that we have presented to you is the life extension of the Trident weapon system to match that of the ship, which has already been extended. To do that, we will refresh the electronics and produce the rocket motors that we need to go to 2042.

Thank you, sir.

[The prepared statement of Admiral Johnson follows:]

PREPARED STATEMENT BY RADM STEPHEN JOHNSON, USN

Chairman Nelson, Senator Sessions, and distinguished members of the Strategic Forces Subcommittee. Thank you for the opportunity to appear before you to discuss the Navy's efforts to maintain the credibility of our strategic deterrent forces. Strategic Systems Programs is responsible for maintaining our currently deployed Trident II forces and to develop capabilities which will support future requirements of our combatant commanders.

The Navy's operational strategic deterrent fleet continues to provide a credible and affordable deterrent against nuclear war. Our Trident II weapons system, comprised of 14 submarines, 6 in the Atlantic fleet and 8 in the Pacific fleet, is maintaining a reliable sea based deterrent for our National leadership. Two of our submarines are undergoing engineering refueling overhauls (ERO). Along with U.S.S. *Alabama* (SSBN–731), which began her overhaul last year at Puget Sound Naval Shipyard, U.S.S. *Alaska* (SSBN–732) has commenced her ERO at Norfolk Naval Shipyard. Three SSGNs have returned to operation, U.S.S. *Ohio* (SSGN–726), U.S.S. *Florida* (SSGN–728) and U.S.S. *Michigan* (SSGN 727). U.S.S. *Georgia* (SSGN–729), the fourth SSGN, is expected to complete her conversion in September 2007.

D5 LIFE EXTENSION

Trident II (D5) Submarine Launched Ballistic Missile Life Extension (LE) program will redesign and replace aging missile electronics and guidance systems.

Under this program, 108 additional missiles will be procured in order to meet long-term inventory requirements associated with the life extension of the *Ohio* class SSBN. Redesign of missile electronics and guidance components is in progress, and procurement of new D5 LE missiles begins in fiscal year 2008. The Trident II (D5) missile has been operational since 1990, providing the backbone of America's strategic deterrence. The low-rate production continuity procurement strategy has been extensively reviewed and approved by the Department of Defense (DOD) and Congress, and has been in execution for nearly 15 years.

This procurement strategy has been proven successful, based on the demonstrated performance of the Trident II D5 weapon system. The Navy submitted a report to Congress in December 2002 that detailed the impact of alternative full-funded procurement strategies and recommended continuation of current production. Continued production of critical components represents the best balance of cost and risk to extend the life of the D5 missile.

NUCLEAR WEAPONS SECURITY

One of our most important responsibilities is maintaining security over the ships and missiles in the Trident Program. Our budget submit includes elements to improve this security posture, including sensored perimeter fencing, waterfront intruder detection systems, and hardened security force facilities and vehicles, as well as a secure command and control network. The roadmap to implement these nuclear weapons security elements over the Future Years Defense Program was recently briefed to the Vice Chief of Naval Operations and Joint Requirements Oversight Council, and execution is underway.

The SSBN Transit Protection Program extends the security umbrella to cover SSBNs transiting between piers and dive points.

RELIABLE REPLACEMENT WARHEAD

The Navy and the National Nuclear Security Administration (NNSA) have recently started a joint program to design a replacement warhead for a portion of the Nation's sea-based nuclear weapons used in submarine launched ballistic missiles. This replacement warhead will not require underground testing. Other key aspects of this program include designing replacement warheads that are more efficient to manufacture, are safer and more secure, elimination of environmentally hazardous materials, and increased design performance margins, thus ensuring long-term confidence in reliability. The Nuclear Weapon's Council, a joint body including the Department of Energy and DOD, endorsed NNSA's recommendation for the Lawrence Livermore/Sandia design as the baseline for the RRW–1 program. However, several features of the Los Alamos/Sandia design are of great interest and they will be developed in parallel to the Lawrence Livermore National Laboratory effort. If sufficiently mature, these design enhancements will be incorporated into the baseline design at the appropriate development step.

The selection of the Lawrence Livermore National Laboratory's baseline design was the first step toward detailed design of a reliable replacement warhead. NNSA and the Navy will now work together to develop a detailed RRW project plan and cost estimate for developing and producing the system. The RRW Project Officer Group, led by the Navy, will present the results of a design definition and cost study to the Nuclear Weapons Council for approval later this year, at which time authorization to proceed to detailed design and system development will be requested.

CONVENTIONAL TRIDENT MODIFICATION

The Conventional Trident Modification (CTM) is the only near-term solution which can provide prompt, precise, conventional kinetic effects at intercontinental ranges. Given the requested resources, we can deliver the initial capability early in 2010, much earlier than any other alternative approach.

CTM adapts the Trident II (D5) missile system to deliver conventional (non-nuclear) effects at global ranges. The Trident Weapon System and the D5 missile are well suited for this role by virtue of the long-range and payload capacity of the D5 missile, and the responsiveness and survivability of the Trident Weapon System. Responsive, survivable and persistent, CTM will defeat a diverse set of unpredictable threats without visible presence or risk to U.S. forces, and with little or no warning prior to strike. CTM implements the New Triad envisioned by the Nuclear Posture Review and is an evolution of deterrence toward conventional weapons. CTM concept of operations have been developed by U.S. Strategic Command.

CTM will use existing D5 missiles, MK4 reentry bodies equipped with aerodynamic controls, global positioning system (GPS)-aided terminal guidance, and a conventional warhead. Advanced error-correcting reentry vehicles with GPS-aided

Inertial Navigation Systems have been flight proven in a previous D5 test program. Total time from decision to weapons-on-target is about 1 hour. CTM technology can be rapidly developed and deployed within 24 months.

The fiscal year 2008 funding request for CTM is $175 million. We have frontloaded the funding profile to provide the capability to the warfighter as quickly as possible. The bulk of the request is $126 million for research and development to proceed with warhead development efforts required to achieve initial operating capability by early 2010. The additional $49 million is procurement funding that is required for reentry body component long lead materials and shipboard systems and trainer modifications.

SSGN

Three of our SSGNs have already returned to service and the fourth will rejoin the fleet in about 7 months. Operational tests are in progress and the first patrol is anticipated before year's end.

These SSGNs are already demonstrating a transformational war fighting capability, carrying Tomahawk cruise missiles and supporting special operating forces. They have enhanced communication and improved masts and antennae for network centric operations. We are forging new relationships within the Department of the Navy and DOD in order to ensure that these submarines be used to maximum advantage in the war on terror.

SUMMARY

Mr. Chairman and distinguished members of this subcommittee, I thank you for your continued support of Strategic Systems Programs and our operational fleet in particular. Our strategic force remains a credible and reliable deterrent today. It is our goal to ensure that the Nation is protected through efforts to maintain the safety, reliability, and surety of our deployed systems. Thank you again for this opportunity to appear today to speak on behalf of Navy Strategic Systems Programs.

Senator BILL NELSON. Mr. Green?

STATEMENT OF BRIAN R. GREEN, DEPUTY ASSISTANT SECRETARY OF DEFENSE FOR STRATEGIC CAPABILITIES, DEPARTMENT OF DEFENSE

Mr. GREEN. Thank you for the opportunity to be here today. I appreciate it. I will keep my opening remarks very brief also. We are in the fifth year of trying to implement the NPR, the recommendations of that review in 2002. Certainly from our perspective the strategic vision that was offered in that review remains valid. It outlined a very new and different strategic environment, a broader range of contingencies, a broader range of potential adversaries that would require a broader range of capabilities to address them, including offensive strike systems, both nuclear and non-nuclear, defenses active and passive, and a responsive infrastructure.

I think over the past 5 years we have made some progress in trying to implement that vision. We have made progress in deploying missile defenses. We have made progress in reducing our nuclear force structure. We have initiated the RRW program, which I think is an important step.

I think the significant gap that we see remaining, and there is more than one, but the most significant gap that we see remaining is the prompt long-range precision global strike mission. We have had a substantial conversation about that already this morning with General Cartwright. I will not belabor some of the points that he has made. I will be available to answer your questions.

I think the one point that I would like to make is that the predominant concern that Congress has expressed is the ambiguity about the near-term solution that the DOD has identified, the conventional Trident modification, that might be misconstrued by Rus-

sia as a nuclear attack and they would respond in kind. Certainly from our perspective that risk is extremely low. We have a very long history with Russia. We have launched over 1,300 ballistic missiles throughout the course of the Cold War and the 1990s. They have never reacted badly to those launches. We have had a couple of instances where there has been a possibility that things could have been misconstrued. There was a launch of a rocket in the mid-1990s out of an area north of Norway that the Russians saw. They were concerned about it. They did not overreact.

There is very little in the history and very little in the Russian reactions to past events and very little in the Russian doctrine that leads us to believe that ambiguity poses a significant risk. That said, we take all risks seriously in this area and we have developed a comprehensive set of confidence-building measures that we think would drive that already very low risk even lower.

Senator BILL NELSON. How about China?

Mr. GREEN. Without going into classified session, I do not think I can address China completely. But certainly at an appropriate time and an appropriate place, we would take into account Chinese sensibilities.

Senator BILL NELSON. Do you have the same degree of confidence with regard to the Chinese response as you do with the Russians?

Mr. GREEN. Absolutely. The Chinese nuclear forces are not on high alert. We have no reason to believe that the Chinese would overreact in this kind of circumstance as well.

[The prepared statement of Mr. Green follows:]

PREPARED STATEMENT BY BRIAN R. GREEN

I. OPENING REMARKS

Chairman Nelson, Senator Sessions, and distinguished members of the subcommittee: I welcome the opportunity to describe our progress in transforming the Nation's strategic capabilities to meet 21st century security challenges. You understand the importance of this undertaking, and recognize the need to field a New Triad better suited to the new security environment. I want to thank the members of the committee for their support. Successful transformation of our capabilities will require a sustained partnership between the Department of Defense (DOD) and Congress.

II. THE NUCLEAR POSTURE REVIEW AND THE ROLE OF NUCLEAR WEAPONS

The Nuclear Posture Review (NPR) of 2001 put in motion a major change in the role of nuclear forces in our deterrent strategy. The NPR emphasized the need for a broader range of deterrent options and capabilities and established a New Triad composed of offensive strike systems (nuclear, non-nuclear, and non-kinetic); defenses (both active and passive); and a revitalized defense infrastructure—all supported by adaptive planning, command and control, and Intelligence, Surveillance, and Reconnaissance capabilities. The New Triad is intended to reduce our dependence on nuclear weapons and improve our ability to deter attack in the face of proliferating weapons of mass destruction (WMD).

The rationale behind the NPR's findings remain valid: the Cold War Triad of nuclear strike systems is not adequate to support the full range of potential challenges and threats in the new security environment. An array of capabilities, including prompt conventional Global Strike, is ultimately necessary to address the new security risks the United States faces.

That said, nuclear capabilities possess unique properties and provide credible military options to deter a wide range of threats, including WMD use. Nuclear weapons will continue to play a vital role in assuring allies of U.S. security commitments, deterring WMD threats, and holding at risk adversary assets and capabilities that cannot be countered through non-nuclear means. The U.S. will continue to honor its extended deterrence commitments to allies—a critical part of our na-

tional security and an important tool in our non-proliferation efforts. Extended deterrence, in turn, requires long-term confidence in the reliability and safety of the U.S. nuclear stockpile, and the Reliable Replacement Warhead (RRW) program is essential to achieving that end. In short, the United States will retain a credible nuclear deterrent at the lowest level of weapons consistent with U.S. and allied security. In transitioning to a New Triad, however, these weapons must be integrated with new non-nuclear strategic capabilities to provide an appropriate range of options.

III. IMPLEMENTING THE NPR

We have made some progress in implementing the NPR over the past 5 years:

1. We have deployed an initial missile defense capability to protect our Nation, deployed forces, friends and allies, and are expanding that capability through evolutionary development and international cooperation.

2. We are on schedule to reduce U.S. nuclear forces to 1,700–2,200 operationally deployed strategic nuclear warheads by 2012. In addition, we have retired the last Peacekeeper intercontinental ballistic missile (ICBM), and DOD plans to retire 50 of the 500 deployed Minuteman III ICBMs and 38 of the 94 B–52 bombers. We will use the savings to provide for a robust Minuteman III test program as well as to help sustain and modernize the remaining bomber fleet.

The remaining Minuteman III ICBM force is being sustained through a life-extension program. The program will keep this element of the New Triad's offensive leg operational and effective into the foreseeable future. DOD is also examining future approaches to a follow-on land-based long-range nuclear strike capability.

3. We have selected a lead national lab to conduct the engineering and design work on a RRW to replace a portion of our sea-based deterrent. The RRW program is vital to assuring long-term confidence in our nuclear deterrent and improving our responsive infrastructure.

4. We are also making improvements to our intelligence and planning capabilities.

IV. GLOBAL STRIKE

Our progress, however, has been uneven. We have not provided the broader range of conventional strike options that both the NPR and the Quadrennial Defense Review (QDR) called for in order to engage high-value or fleeting enemy targets located in access-denied areas; nor have we closed the gap in prompt, long-range conventional (non-nuclear) strike capabilities that the QDR identified.

The 2006 QDR considered the new security environment and underscored the need for prompt Global Strike capabilities to address a range of challenges. The QDR identified the following objectives for Global Strike's operational and enabling capabilities:

- Provide the President and the warfighter with a broader range of conventional response options to deter aggression or coercion;
- Attack fleeting enemy targets rapidly;
- Fuse intelligence and operations to exploit time-sensitive intelligence;
- Find and precisely target enemy capabilities in denied areas;
- Deter, defend against, and respond in an overwhelming manner to WMD attacks; and
- Shape and defend cyberspace.

DOD has strengthened its conventional strike capabilities with the introduction of the Joint Air-to-Surface Standoff Missile (JASSM) and the Tactical Tomahawk (TACTOM) cruise missile. These missiles offer stealthy (in the case of JASSM), standoff capabilities that can be employed in substantial numbers to destroy high-value, well-defended, and/or relocatable targets. Testing has begun on the JASSM Extended Range (JASSM–ER), which will possess more than double the range of the JASSM (over 500 nm, vice 200 nm). JASSM–ER also will be able to loiter and transmit in-flight imagery to planners. TACTOM possesses many of the same traits as JASSM–ER but also can also be retargeted in flight.

In addition, the DOD has nearly completed reconfiguring four strategic nuclear ballistic missile submarines (SSBNs) into guided-missile submarines (SSGNs). The first three SSGNs have completed their conversion with the final conversion to be completed in late fiscal year 2007. Two of the SSGNs will become operational in fiscal year 2007 and two more in fiscal year 2008. Each SSGN can carry up to 154 Tomahawk cruise missiles and deliver special operations teams.

However, analysis conducted during the 2006 QDR also highlighted an important gap in prompt, long-range conventional (non-nuclear) strike capabilities. Specifically, the QDR found that existing conventional forces, such as fighter and bomber aircraft and surface ships, could take hours to days to deploy and strike a target. The new TACTOM and JASSM, although valuable additions to conventional forces, do not fully address this gap. Today, only nuclear-armed ballistic missiles are available 24 hours a day, 7 days a week, to engage distant, fleeting targets promptly (within about an hour from the time of an execution decision). Without a portfolio of prompt conventional Global Strike capabilities—able to generate timely effects, anywhere, anytime—America's adversaries will retain substantial freedom of action and potential safe havens from which to operate.

Prompt Global Strike capabilities may be needed for time-sensitive operations such as interdicting the transfer of WMD from rogue states to terrorists, preventing a rogue state from launching a ballistic missile armed with a WMD payload, or disrupting or delaying such actions before other U.S. forces arrive on scene. In addition, prompt conventional Global Strike capabilities have the potential to suppress follow-on launches of ballistic missiles against the United States, its forces and allies, and this capability can work effectively in concert with ballistic missile defenses to help mitigate the growing long-range missile threats the United States will face in the future. In order to hold these types of targets at risk, the 2006 QDR called for a portfolio of prompt Global Strike capabilities.

V. CONVENTIONAL TRIDENT MODIFICATION

The 2006 QDR determined that a program designated Conventional Trident Modification (CTM) was the best low-cost, low-risk, near-term solution to begin closing the current gap in prompt conventional global strike capabilities. In fiscal year 2007, DOD requested funding to modify two Trident II D5 missiles on each of the 12 deployed strategic ballistic missile submarines (SSBNs), and replace their nuclear warheads with non-nuclear warheads. CTM would provide a unique conventional capability to respond to fleeting, time-sensitive, high-value targets virtually anywhere in the world. The President's budget for fiscal year 2008 seeks $175 million for this initial Prompt Global Strike system.

Although DOD determined CTM to be the best near-term option for conventional prompt Global Strike, the Department is considering other, longer-term solutions, both sea- and land-based, to broaden the portfolio of prompt, non-nuclear capabilities. The additional concepts include sea- and land-based conventional ballistic missiles and advanced technologies, such as hypersonic glide vehicles, employing precision guidance, advanced conventional weapons, and propulsion. While these concepts promise to provide expanded Global Strike capabilities, for the most part they generally lack the technological maturity to achieve full operational status before 2015.

VI. CONGRESSIONAL CONCERNS

Congress raised concerns about CTM last year, and directed that DOD provide a Report to Congress in consultation with the Department of State. A classified report, signed by both Secretary Gates and Secretary Rice, was transmitted earlier this month. I commend the report to you; it addresses the critical need for Conventional Trident and the concerns. While the concerns raised were posed in terms of CTM they apply to many of the other prompt Global Strike capabilities that may be available in the mid- to long-term.

The most frequently cited concern is that a CTM launch could be misinterpreted as a nuclear attack, prompting Russian retaliation. The CTM report states that the risk is extremely low and can be managed effectively. Few states have the sophisticated technology required to detect and track a ballistic missile launch. However, the Russian Federation has these detection and tracking systems and is generally able to evaluate quickly a ballistic missile's flight path and determine within tens of miles the missile's aimpoint. In that respect, if Russian sensors detected and tracked a CTM launch, the Russian command would quickly identify it as non-threatening. Moreover, the Russian command would readily distinguish between a CTM launch and a massive nuclear first strike.

Historically, the Russian Federation has not over-reacted to an un-notified or unannounced U.S. or Chinese missile launch. Furthermore, the United States and the Russian Federation now have a more cooperative and less adversarial relationship than during the Cold War, and this new relationship provides a much-changed context in which any launch of a ballistic missile would be understood.

Nevertheless, the United States takes the possibility of misinterpretation seriously. While the risk is extremely low, DOD has developed a comprehensive assur-

ance strategy consisting of confidence-building and operational measures, promoting a high degree of transparency into CTM operations. Engagement of Russia at senior levels is ongoing.

Another concern is that prompt Global Strike, and CTM in particular, may not be well-supported by intelligence capabilities. As with all military operations, CTM operations would require actionable intelligence that is both accurate and timely and provides a high level of situational awareness. Existing intelligence assets can support planning and operations of prompt Global Strike systems like CTM, DOD continues to improve its global intelligence, surveillance, and reconnaissance capabilities. Indeed, current efforts to achieve more persistent collection capabilities against both legacy and emerging threats would be maturing as the Conventional Trident Modification becomes operational. They would be available to support key decision-makers and planners involved with employment of future prompt Global Strike capabilities. During time-sensitive crises the speed and range attributes of prompt Global Strike systems, like CTM, actually would provide increased time for senior decisionmakers to evaluate and refine intelligence before making a decision to employ force.

There is also some concern for CTM's status under existing arms control treaties. CTM is fully compliant with all U.S. treaty obligations. A complete analysis of this issue is available in the Report to Congress on Conventional Trident Modification. In summary:

- START:
  - CTM is not a new type of SLBM or new kind of Strategic Offensive Arm.
  - CTM will remain accountable and subject to START's many provisions for as long as START remains in force. These provisions include:
    - Data updates
    - Re-Entry Vehicle On-Site Inspections
    - Transit notifications
    - Launch notifications
    - Telemetry exchange for test launches
  - CTM will have the same number of warheads attributed to it as to the nuclear-armed Trident D5 (8 warheads).
- Ballistic Missile Launch Notification Agreement:
  - Notification of CTM flight test launches will continue to be provided; and
- Moscow Treaty:
    - CTM's conventional warheads will not count against the 1,700–2,200 limit on operationally deployed strategic nuclear warheads.

VII. CONCLUSION

DOD strongly believes that conventional prompt Global Strike is critical to meeting evolving U.S. security needs in the 21st century. The joint DOD-State Department Report to Congress presents a compelling assessment of the need for CTM and a clear strategy for mitigating the already low risks associated with its use. In the report, Secretary Gates and Secretary Rice agreed:

- There is a critical need for CTM to respond promptly to potentially grave dangers with conventional means—including high-value or fleeting targets such as terrorists or rogue states armed with WMD that may be in hard-to-reach or highly defended areas;
- CTM is the best and only near-term, low-cost, low-risk option to fill an existing capability gap;
- The risk of misinterpretation is extremely low and can be readily managed;
- Development and deployment of a Conventional Trident is needed to achieve a near-term prompt conventional global strike capability; and
- The substantial benefits of CTM far outweigh any risks.

A sustained partnership between DOD and Congress will be needed if we are to succeed in transforming our Nation's strategic capabilities to meet the uncertainties and challenges ahead. In particular, we need to continue the progress on missile defense, revitalize the nuclear infrastructure with the RRW programs, and address the need for conventional prompt Global Strike. The Conventional Trident is the near-term solution, with advanced technologies to expand the range of effects in the longer term. The Department will require your continued support to replace the legacy Cold War force posture with a New Triad that is better suited to the new security environment.

Senator BILL NELSON. We will explore that further.

Senator Sessions.

Senator SESSIONS. Mr. Green, welcome to your committee.

Mr. GREEN. Thank you, sir.

Senator SESSIONS. I am interested that the Department persists in the Trident modification, the conventional Trident. I had suggested that perhaps we better be going forward with something else after our last vote. But I give you a chance. Can you briefly, succinctly tell us the strategic rationale for the prompt global strike?

Mr. GREEN. Certainly. Right now we have the ability to reach out globally and promptly, but only with nuclear weapons. We have the ability to reach out promptly with conventional weapons, but only if you have tactical forces properly placed, if they are in the right place at the right time. We can also reach globally with conventional weapons, but it is not timely. That would be in the bomber force and the long-range bomber force can take many, many hours, days in fact, to reach its target.

The gap that we see is that prompt global precision conventional strike. There are a collection of—we prefer actually in our shop not to talk about specific scenarios, but a set of attributes that targets have that we may well want to think about that kind of capability, that prompt global strike capability, to address. Those attributes are time-urgent, very distant, perhaps highly defended or in other ways access denied for the United States; high value targets, high regret factor for not striking a target; and potentially an interest in low collateral damage.

It is those kinds of targets, targets with those sorts of attributes, that make us think that this particular kind of capability is very valuable.

Senator SESSIONS. At our hearing we went through this in some detail. But would you explain for us why the cruise missile is not an adequate global strike?

Mr. GREEN. The cruise missile, of course, flies subsonically. They are almost always quite a distance away from a target. They have to fly a long way to get there. When you look at a map and plot out how long it takes to get to a target and how responsive it can be, simply in terms of distance and time it does not have the same kind of responsiveness that a system like a long-range ballistic missile, wherever it is fired from, would have.

The goal with the conventional Trident is to be able to strike a target within about an hour from the decision time to move ahead. If you use the same metric for a cruise missile, you would be talking many hours before you could strike the target.

Senator SESSIONS. Who has the lead in the DOD for evaluating the various alternatives for prompt global strike and who is the advocate in the Department for this capability?

Mr. GREEN. Certainly OSD-Policy, the part of the Department that I represent, is an advocate for this kind of capability. In terms of the specific systems involved, that gets into the technical detail and the engineering analysis, and Acquisition, Technology, and Logistics takes a look at that. Certainly the warfighter gets involved in the discussion about the kinds of capabilities.

Senator SESSIONS. You are making me nervous. There are a lot of people you are mentioning.

Mr. GREEN. Acquisition, Technology, and Logistics is one organization, I should note.

Senator SESSIONS. There needs to be somebody that is looking at this really hard, because I think it is an important capability. I agree with you that there is virtually no chance of a misinterpretation of a single launch. But we have a lot of concern about that in Congress, primarily that and perhaps other issues.

Mr. D'Agostino, could you briefly describe the design features of an RRW that is to the extent that is not classified, and discuss the concerns that some scientists and engineers have over the reliability of the existing stockpile and perhaps the concerns some have expressed about a new untested weapon and whether or not it would be reliable? That is three questions. You have 3 minutes.

Mr. D'AGOSTINO. That will be a challenge in and of itself.

Senator SESSIONS. We do not have to vote yet.

Mr. D'AGOSTINO. I may need one of those supercomputers to pull that off.

We will start off with the RRW question first, the features that I feel are important, which are unclassified. We will not discuss the classified details, of course, I would be very happy to come to the committee and talk to you about, because they do support my unclassified statements.

One element which goes to the case material that is being proposed—I cannot say none of the material itself, but the processes and the material that are being proposed for the RRW will allow us to get rid of a complete processing line down at Y–12, a fairly significant processing line that we will not need any more in the future. It is a line that generates a tremendous amount of wastes. It is a waste that we have to deal with and pay for and will pay for out into the future, and it is a waste stream that I would like to get off the books, if you will, and not build it into our legacy as we move forward in determining what the smaller nuclear weapons complex needs to be.

There is another material in the—it is called interstage material, also known as Fogbank, but the chemical details of course are classified. That is at a facility that we currently have right now. It is a very complicated process. I use that to support the Navy's program. It takes a tremendous effort to operate this facility. It is dealing with toxic materials hazardous to our workforce, but it is required. It is the way we did things back in the Cold War.

The RRW will allow us to not have to develop and maintain that capability, and that is very important because that has a long-term cost and it has an impact on our workforce, just like the case material.

There are some features associated with the explosive material that we use for the proposed RRW design, the design we are going to spend some more time on, and in fusing insensitive high explosives versus conventional high explosives. An insensitive high explosive, for one thing, is a type of material that you can hit with a hammer, throw into a fireplace, do a lot of things to it; it will not start to chemically react and explode.

That provides a tremendous amount of flexibility in our manufacturing process, is one; but two, safety. Clearly it is a much safer way to do business, and there is a legacy cost not just for the Department of Energy (DOE), but for the DOD as it moves these warheads around in their storage facilities, on the submarines, or in the silos, how we do things in the Air Force.

So this is just a sampling, if you will, in the interest of time.

Senator SESSIONS. It really has the potential to not be more costly, in fact to actually save money, we hope. That would be your challenge.

Second, there are some other—I see one of the things on your web site, NNSA web site, about safety. You are confident they would be considerably more safe.

Mr. D'AGOSTINO. I am very confident in that. We have not built it yet, but this is—we have systems out in our current stockpile that have certain attributes that we have talked about, insensitive high explosives and the like, but putting them together in this format allows us to maximize and take advantage of all of the features that we have tested before in the past. So I am very confident that as we transition the stockpile, as the President said, into the lowest possible number necessary and change the size and composition and character of our workforce, of our nuclear deterrent, that in the long run as we have an RRW stockpile it will drive costs down significantly.

I know I can point to specific projects within the NNSA that I will not have to build, liabilities I take off the books right now and I will not have to program in, as a result of the features this proposed warhead design brings to the table.

Senator SESSIONS. I think that is good. Just very briefly, the reliability of the aging system. Is there some question that is raised about that by reliable scientists, and would we lose deterrent effect if people thought that the new one that is untested could not work? How do we handle those two questions?

Mr. D'AGOSTINO. First I would like to emphasize that it is safe and secure. We would like to make it safer and more secure. I think, given how as the General described where we were in the Cold War and how we are in a constant mode of bringing on new systems as we learned about problems, we have the advantage now, where it has been 20-plus years as we have gone through this type of a design effort, to bring all those new features to the table.

What we are concerned about is sustainability over the long-term, continuing to do life extensions, which take a Cold War system off the table, replace certain components and parts that we think are aging, and sticking it back out. Over time we are concerned that these changeouts will introduce small variabilities in manufacturing processes that have evolved since the last time we have done it, and that over time will cause some questions into our ability to certify over the long-term these very low-margin systems. These are very high-performance systems.

We want a design and we believe we have a proposed design that is much more robust from the standpoint of performance margins. We are much further away from the need to ever conduct a test because of the margin on the primary associated with this system.

There is a bit of a fallacy that we have always tested a warhead before we have introduced it into the stockpile. That is absolutely not true. In a closed session I could talk to you about specific systems that you might find interesting, or in a brief, I can go over specific systems that have been deployed without testing, and the variations. We have a very strong test pedigree associated with this proposed design. We know a lot about this primary, which is the pit. It is also known as the plutonium pit. This is a pit design that has been tested and it is a minor variation of a pit design that is currently in our stockpile right now. We have a lot of data on that pit and we have a lot of information on that secondary. So we are very confident.

Senator SESSIONS. Thank you.

Senator BILL NELSON. I have a number of questions for the record and we have about 6 minutes, so let me just go through these questions.

Mr. D'Agostino, the NNSA has requested $88.8 million for the RRW for 2008. At the time the budget request was submitted to the Nuclear Weapons Council, it had not approved the decision to study the feasibility of the RRW. Now that it has approved the feasibility study, will the 2008 funding be used to finish the phase 2A study and begin the phase 3 study?

Mr. D'AGOSTINO. Yes.

Senator BILL NELSON. All right. I posed a number of questions to General Cartwright and I would pose a number of those questions to you. The proposed RRW design would be a new warhead, yes or no?

Mr. D'AGOSTINO. The design is new. The warhead is the same. It is the same form, fit, and function. It is a new design to replace an existing weapon that we have in our stockpile.

Senator BILL NELSON. This new warhead would fit into an existing delivery system, which in the case of the first RRW design would be the Mark 5 reentry vehicle for the D–5 missile?

Mr. D'AGOSTINO. Yes, sir.

Senator BILL NELSON. The first RRW would replace the W–76 in whole or in part and would meet the same military requirements met by the W–76?

Mr. D'AGOSTINO. Yes, Mr. Chairman.

Senator BILL NELSON. Do we know for sure that the RRW could be certified and placed in the stockpile at this point and that the purpose of the studies that the NNSA will conduct for the next 3 years will determine that?

Mr. D'AGOSTINO. That is right, Mr. Chairman. We are working on that path. At this point right now I am very confident.

Senator BILL NELSON. Based on reviews done to date by the NNSA laboratories, do you have the confidence that the RRW design will be able to be certified without testing?

Mr. D'AGOSTINO. Yes, sir.

Senator BILL NELSON. If it becomes clear at some point that it would not be possible to certify the RRW without nuclear testing, would you support terminating it effort?

Mr. D'AGOSTINO. I would say that because it is one of the most significant criteria that we had to proceed down this path, we

would have to examine that. We would have to say, why would we go forward in continuing with this effort without that.

Senator BILL NELSON. If successful, the RRW would provide increased confidence in the stockpile and enable substantial reductions in it overall size of the stockpile?

Mr. D'AGOSTINO. Yes, sir.

Senator BILL NELSON. Particularly in the size of the reserve?

Mr. D'AGOSTINO. That is right, Mr. Chairman.

Senator BILL NELSON. The Nuclear Weapons Council decided to study the feasibility of the RRW and not to manufacture or deploy an RRW?

Mr. D'AGOSTINO. That is right.

Senator BILL NELSON. Admiral Johnson, assuming that the RRW is a feasible replacement for the W–76, what is the right mix of RRWs and W–76 warheads in the inventory?

Admiral JOHNSON. As General Cartwright pointed out, we first continue with the 76 life extension. That is the Nation's deterrent. Once we go into initial production and then followed by full production of the RRW, it becomes a one-for-one replacement. The 76–1, those warheads that are life extended to the 2040, 2045 region, I would think it would be in the Nation's interest then to time the production line for best value. So rather than give you a direct number for something that is 10 years away or so, it is a one-for-one replacement.

Senator BILL NELSON. Can you give us a percentage?

Admiral JOHNSON. In the early production run we expect to make about 50 per year. So in the first 5 years, it would be 250 weapons. Then depending on what DOE does with their ability to increase production, we could stay at that rate. As the inventory went down, we could catch that. Or if Congress chose to increase the production capability, then it would be an accelerated one-for-one replacement.

Senator BILL NELSON. All the rest of the ones in reserve at that point? What would happen?

Admiral JOHNSON. The need for reserve is expected to be reduced, as every member of the panel has said.

Senator BILL NELSON. What is the down side of delaying the W–76 life extension to see if the RRW is feasible?

Admiral JOHNSON. That would be a serious error in my opinion. 76 is the bulk of the deployed sea-based warheads. It is our Nation's deterrent. We are ready to go into production on the life-extended warhead this year and we should proceed with that.

RRW is not designed. In fact, we are only at the beginning of that design, laying out the baseline, coming back to you with a proposed cost and schedule that you will see later in the year.

Senator BILL NELSON. A variation on my previous question. If the RRW is feasible, will the Navy be able to reduce the combined number of RRWs and W–76 life-extended warheads to less than the total of the number of W–76 warheads today? I am talking about the Navy only. In the stockpile.

Admiral JOHNSON. With all due respect, Mr. Chairman, the requirement for numbers is really General Cartwright's to provide to me. I meet that requirement. My expectation is that those numbers will continue to go down.

Senator BILL NELSON. Mr. D'Agostino, the NNSA fiscal year 2008 pit manufacturing and certification campaign budget request includes funds for both the RRW pits and the W88 pits. How much of the $281 million for pit manufacturing is for RRW pits?

Mr. D'AGOSTINO. I would like to take that for the record, but provide also a response if I could. The actual number, percentage-wise, I will get for the record if I could. It is important that right now our 88 pit effort is to focus on our commitment on making 10 pits per year. This will be the first year. It is a fairly significant milestone to support the Navy. We will do that over the next 2 to 3 years in order to meet what we think jointly with the Department of the Navy we need to maintain.

After that, what we want to do is shift our production capability to thinking towards the future, using this RRW process, which we feel is going to reduce the processing steps by 20 to 30 percent on how we used to build pits. The actual number, I would have to take that for the record if I could, please.

[The information referred to follows:]

The portion of the budget estimate associated with reliable replacement warhead (RRW) pit development planning is $13 million, however, other elements of the pit campaign also support our planning for RRW.

The purpose of the pit campaign is to make war reserve pits for the stockpile (currently the requirement is focused on for pits for the W88 and RRW) and to increase the pit manufacturing capacity (i.e., the number of pits/year) of the nuclear weapons complex to that needed to support the nuclear weapons requirements of the Department of Defense.

The efforts in the campaign are divided into four categories: W88 pit production; RRW pit development planning; plutonium experimentation to enhance certification confidence and to address stockpile issues; and technology development and planning to increase pit manufacturing capacity for whatever pit type is required. Within those four categories, the $281 million in the fiscal year 2008 request is associated as follows: W88 production $142 million; RRW pit development planning $13 million; plutonium experimentation to enhance certification confidence and address stockpile issues $34 million; and technology development and planning to increase pit manufacturing capacity $92 million.

Senator BILL NELSON. So the 10 per year are W88 pits?

Mr. D'AGOSTINO. That is right, Mr. Chairman. For the next 2 to 3 years we will be building up a reserve of pits that will allow us to—as part of our surveillance, what we do is every couple of years we take a W88 warhead pit out of the stockpile and we do destructive testing on that pit. What that ends up doing, because the Nation does not have a long-term or maintainable pit production capability, is that it reduces our W88 pits by one and it eats into the reserve warheads.

So we want to build up a couple of years worth of production capability. The exact number is classified, but in closed session we could tell you. A couple years of production capability, that will give the Navy as well as the DOE confidence that we will be able to do surveillance work on the pits for the life of the expected warhead, well out on the W88 warhead over the next 2 decades or so.

Senator BILL NELSON. So the question you are going to answer for the record is, how much of the $281 million requested will actually go for the manufacture of RRW pits?

Mr. D'AGOSTINO. Yes, sir.

Senator BILL NELSON. Okay.

It also includes $24.9 million for the consolidated plutonium center. How is that going to be used?

Mr. D'AGOSTINO. The $24.9 million for the consolidated plutonium center is what we call process development steps. As we look forward into the future at our Nation's need to put together a pit manufacturing capability, whether it is 50 pits per year or 125 pits per year is something we will work out with the DOD. That is an important distinction because it drives us in a couple of different directions.

What we are looking at with that money is to do the process steps, and to try to figure out what type of equipment we would need in this consolidated plutonium center. It helps us with those types of studies needed to continue the studies for what we are in the process of doing right now, which is a National Environmental Policy Act activity to get to a record of decision on a long-term pit capability. So it will allow us to do the analysis on the different options that we are currently working on right now in a very public process.

Senator BILL NELSON. The requirement for a security force at the NNSA facilities has increased rather dramatically.

Mr. D'AGOSTINO. Yes, sir.

Senator BILL NELSON. More physical requirements, more sophisticated weaponry to meet more stressing design basis threats. These are all contractors and are managed differently at each site. The guards certainly put their lives in jeopardy to protect thousands of nuclear weapons and tons of weapons-grade materials.

So what about taking a more uniform approach to managing and training the guard force? Have you considered federalizing this force under a single contract? Have you looked at managing the force more like a law enforcement entity?

Mr. D'AGOSTINO. Studies have been done in the past which have looked at federalizing, consolidating into one large contract, or leaving things as we currently have it, which is largely defining the performance characteristics that we have, as a way to lay out essentially a bar that has to be met, and then going out and doing independent assessments. I have not reopened the past studies which once looked at federalizing this activity. I am aware of our efforts in essence to look at how do we drive consistency across our guard force and as part of that what we have done is we have worked with our HSS, which is the Office of Health, Safety, and Security, under part of our Department, and to simplify our security requirements and set up independent teams to go out and look at that.

I do not know if this is the right time actually to relook at that study and to drive consistency. But I will say that one of the things we are trying to do is not increase the size of the guard force. One of the elements of our Complex 2030 vision is to have fewer sites with special nuclear materials and have fewer locations within sites for special nuclear materials. I expect that to drive our guard forces numbers down and shift quite a bit.

It is much easier to drive things down and shift a bit with contracts rather than a Federal workforce. It is just something that is in the back of my mind as I look to try to stabilize and level off at the right level on our security budget, because it does go up significantly between 2007 and fiscal year 2008.

Senator BILL NELSON. What you might do is look at a uniform standard among all your different contracts.

Mr. D'AGOSTINO. I believe we do have that uniform standard in our DOE orders, but what we have to do is be consistent in how we evaluate our different contractors. There are multiple contractors out there for security contracts.

Senator BILL NELSON. This is one we cannot mess up.

Mr. D'AGOSTINO. Yes, sir.

Senator BILL NELSON. General, during the deliberations on the 2007 year it became clear that the Air Force could not meet its requirements with the reductions in the B–52 bomber fleet first proposed in the Quadrennial Defense Review (QDR). So Congress approved a reduction of up to 18 bombers from the current fleet of 93 B–52s. The authorized reduction was predicated on completion of a report that would analyze all aspects of the overall bomber fleet, including the requirements and the modernization plans.

Now it is our understanding that the report will not be completed and submitted to Congress until at least the end of this fiscal year. As a result of the reduction of the 18 bombers—therefore, they will not be reduced until fiscal year 2008. So does it make sense to authorize more reductions prior to receiving the report from last year, as the questions are the same?

So what has changed since the 2007 authorized retirement of only 18 bombers, rejecting the request in the QDR to a transition to 56 bombers?

General BURG. Yes, sir. Senator, the overall management of the fleet of aircraft the Air Force has been charged to be responsible for is a big challenge, and I think you have already heard from our chief in terms of managing that fleet to try to get the best capability for the investment that you are making in that bomber force. We in the Air Force believe that we can reduce the number of B–52s in the bomber fleet while retaining the B–1s and B–2s and maintain the bomber capability that the combatant commanders require to support their war plans.

We recognize that Congress is very interested in the overall numbers of the B–52 remaining and that we have specific directions to retain the bomber force or the B–52 force at its current level until this study is complete and Congress gets a chance to review those results.

We agree that the study completion will probably be later this fall and it will not be available to you in time to inform the 2008 budget decisions.

Senator BILL NELSON. Would the Air Force retire all of the 18 B–52s authorized to be retired in 2008?

General BURG. The Air Force would like to have the authority to retire those bombers that are awaiting the results of that study, and our budget submission submits a program line that would retire those aircraft.

Senator BILL NELSON. What are the changed circumstances that would persuade Congress to authorize the retirement of any additional B–52 bombers?

General BURG. Sir, I would answer that the circumstances are still roughly what they were prior to this report being requested by Congress, that the combatant commanders have told us what their

needs are for a bomber force, and we feel we can meet those needs with the B–2, B–1, and the reduced B–52 force; that there are still questions from Members of Congress on whether that is an adequate bomber force for the future. But the Air Force believes that it is an adequate bomber force with the reductions that we had programmed to take in the 2007 submission.

Senator BILL NELSON. General, what is the minimum number of B–52 bombers needed to protect all the plans and requirements?

General BURG. We believe that the number that we have proposed in the 2008 budget, 56 total aircraft inventory of B–52s, is the adequate number for the B–52 when combined with the B–1 and B–2 force to provide for the combatant commanders' requirements. Now, we recognize that there is some risk in that force. If you have two major contingencies at the same time, you accept some risk. But if you believe that your future requirements will be based on a single major combat operation activity, that bomber force with the reduced B–52 numbers meets the combatant commanders' requirements.

Senator BILL NELSON. In that authorization bill from the 2007 year, it directed the Air Force to maintain 44 combat coded B–52 bomber aircraft, which would require a total of 74 in the inventory. The 44 coded aircraft was a minimum to meet requirements. Does the fiscal year request mean that the 44 combat coded aircraft can be met within the 56 B–52 bombers?

General BURG. Sir, we recognize the same requirement that you have stated, 44 combat coded B–52s, and we are studying the ability to make 44 combat coded B–52s available with the force of 56 total aircraft inventory. We do not have an answer for you right now on whether that is easy to do or how challenging it is to do in terms of resources required. It becomes more expensive to maintain more combat coded aircraft.

The answer is still not available to us right now.

Senator BILL NELSON. So the answer is we do not know if you can maintain 44 combat coded within the 56?

General BURG. Yes, sir, that is correct.

Senator BILL NELSON. A review of the various modernization programs indicates that the Air Force could support somewhere between 65 and 70 B–52 bombers, but only if the outyear funding for the CONECT program was to be extended. How much would it cost to modernize all 76 B–52s?

General BURG. Sir, I would appreciate the opportunity to take that question for the record and get you a very specific answer. We feel that we have the adequate resources in the modernization programs supporting the B–52 to field up to 72 aircraft with the modernized capabilities that we are building into the B–52. But that uses spares that we had anticipated or components that we had anticipated using as spares to support a 56-aircraft force.

[The information referred to follows:]

In order to modernize the current fleet of 76 B–52s, the fiscal year 2008 APAF funding required would be $19.02 million. Below are the breakout costs of modernizing the B–52s (costing in millions):

[In millions of dollars]

Advanced Weapons Integration	$5.51
MLR–2020 (ILS receiver)	1.41
Electronic Countermeasure Improvement (ECMI)	3.80

[In millions of dollars]

Avionics Midlife Improvement (AMI)	0
Enhanced Data Link	1.76
Digital Stability Augmentation Components	6.54

Fiscal year 2008 funding does not complete the following two modification efforts:
ECMI: Additional funding required to complete installation—fiscal year 2009 ($2.7 million) and
AMI: Additional funding required to support 76 AMI configured B–52s—fiscal year 2010 ($3.1 million).

Senator BILL NELSON. The Air Force already decided, did it not, to terminate two other modernization programs, the AMI and the ECMI, before they had purchased all the necessary upgrade kits? So you would have to restart the manufacturing line.

General BURG. Yes, sir, we would need to restart the line to purchase more kits, and I can give you specific costs for the requirement there. We think it is about a $216 million bill to maintain 76 aircraft fully capable as you have described, as opposed to 56 aircraft.

Senator BILL NELSON. General, let me ask you. I understand that the Air Force is thinking about using parts of the Peacekeeper to develop a conventional ICBM that would be launched from Vandenberg. Is this a violation of the START treaty?

General BURG. Sir, if I could clarify some aspects of what you just asked. We do have a program that would use the first segment and third stage of a Peacekeeper missile, which was a nuclear ballistic missile. But it would use those stages in a way that is not a ballistic missile. The missile follows a trajectory that is not ballistic. The difference is very significant in terms of how you describe the capability and how other nations might view that capability.

We recognize the concerns of Congress in terms of conventional ballistic missiles being confused with their nuclear ballistic predecessors. But this is a significantly different capability. It flies in a trajectory that is 90 percent lower than a ballistic missile. It flies on a boost-glide trajectory. But it is a fact that we would plan to use the first three stages of a Peacekeeper missile to support this new conventional strike capability. We do not believe it is a violation of the treaty and the treaty is open to different ways to describe these kinds of capabilities not as former nuclear missiles.

Senator BILL NELSON. We need a briefing on that particular system as to what you plan to do with it and so forth.

General BURG. Sir, we would be very happy to bring that forward to you.

Senator BILL NELSON. For the General and for the Admiral: The military Services each submit unfunded priority lists (UPLs). Can you briefly, because they just called the vote, discuss the items on the respective lists that fall into your areas? Let us go with you, Admiral.

Admiral JOHNSON. I do have an item on the UPL and if my good associate in the Air Force will go first I might recover it in time.

Senator BILL NELSON. General?

General BURG. Sir, unfunded requirements cover a broad spectrum. For the specifics of how we would use your inputs on the UPL, I would like to answer that for the record if that is acceptable and give you very specific numbers and places where we have capabilities in my portfolio.

[The information referred to follows:]

Below is a listing of Air Force programs of interest to the Senate Armed Services Committee Strategic Forces Subcommittee that have been submitted on our unfunded priority list.

ICBM Remote Visual Assessment (RVA) $13.5 million:

Adds funds to purchase 90 additional RVA kits in fiscal year 2008. This completes RVA deployment at one intercontinental ballistic missile (ICBM) wing to improve security forces' situational awareness. The RVA program sends visual signals from remote, unguarded Minuteman launch facilities to security force control facilities. The added visual information allows the security controllers to prioritize and tailor the responding security forces. In total, the 3 ICBM wings have missile launch facilities scattered across 44,600 square miles.

Common Vertical Lift Support Platform (CVLSP) $4.2 million:

Funds Research and Development to select replacement for 50 UH–1Ns (25 AFSPC, 6 AETC, and 19 AFDW) with 54 CVLSPs (28 AFSPC, 6 AETC, 20 AFDW).

Senator BILL NELSON. Admiral?

Admiral JOHNSON. Sir, on the UPL there are two 87-foot cutters to be used in the transit security program as we escort our vessels in and out of port. We would like to accelerate those purchases, if possible. Those ships are bought through the Coast Guard, right off the Coast Guard production line. They are identical in every respect to a Coast Guard vessel. We arm them slightly differently, but other than that, and those are easily changed, they are identical vessels.

Senator BILL NELSON. These are not the same Coast Guard ships that they are suddenly having manufacturing problems with, are they?

Admiral JOHNSON. No. Those are a different ship, no, sir.

Senator BILL NELSON. Jeff, do you have anything?

Senator SESSIONS. No. I would just say, Mr. Green, I am a little concerned about an article from "The Parliamentarian" in the Czech Republic that was concerned about the United States' negotiating tactics with regard to the European site. I think that it is important that we stay on top of that and make sure that we are handling that in a way that is acceptable to them, because I think that is an important thing for the whole world and for Europe.

I will ask you for the record, Mr. Green, about the 2006 bill. The National Defense Authorization Act required a commission on the implementation of the new strategic posture of the United States. That has not been stood up yet, I understand, and I would like you to respond as to why that has not.

[The information referred to follows:]

Implementation of the Strategic Posture Commission (SPC) has faced several hurdles, most notably the absence of any appropriations for the commission. Initial estimates were that the SPC would need $4.25 million to conduct its work, but no funds were provided by Congress in the fiscal year 2006 budget. The Department of Defense (DOD) sought funds for this purpose in its fiscal year 2006 reprogramming request, but Congress reduced the funds available for all DOD commissions. As a result, the SPC received no funding. Congress added four new unfunded commissions in the National Defense Authorization Act for Fiscal Year 2007, but only $6.7 million was appropriated for all DOD commissions in fiscal year 2007. The President's fiscal year 2007 budget requested additional funds for commissions, but Congress cut most of the request, citing "excessive growth" in boards and commissions. DOD submitted a fiscal year 2007 reprogramming request that would shift funds to support statutory and discretionary commissions.

In addition to funding issues, there is also the matter of filling the commission positions. Of the 12 individuals selected by the Secretary of Defense in consultation with Congress, only 9 accepted the invitation to serve. We have been working with

the SPC chairman to develop a list of alternate candidates for the Secretary's selection and approval in consultation with Congress.

Senator BILL NELSON. Thank you all for your participation today. You have been very kind and this hearing is adjourned.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR BILL NELSON

RELIABLE REPLACEMENT WARHEAD AND THE W–76

1. Senator BILL NELSON. Admiral Johnson, what modifications will the Navy have to make on the Mark 5 re-entry vehicle to accommodate the first Reliable Replacement Warhead (RRW) design?

Admiral JOHNSON. Modifications to the war reserve aeroshell and antenna systems are expected to be minimal. Changes to Reentry Body (RB) and Release Assembly (RA) cable assemblies and the likely addition of a new RA connector are required to support the new surety options. That being said, however, a new warhead Arming, Fuzing, and Firing (AF&F) system jointly funded by National Nuclear Security Administration (NNSA) and Navy will have to be developed and produced for the RRW design.

2. Senator BILL NELSON. Admiral Johnson, assuming that the RRW is a feasible replacement for the W–76, what is the right mix of RRWs and W–76 warheads in the inventory?

Admiral JOHNSON. NNSA production capability of RRW is the limiting element. The minimum number needed of W–76–1 is the planned fiscal year 2012 submarine outload. The planned RRW build, limited by available RRW production rate and planned production time of 10 years will produce a number of RRWs far short of the needed inventory. If W–76–1 is produced in quantities to supply the minimum submarine outload in fiscal year 2012, then the RRW can replace the end of production of W–76–1 production requirement with minimum risk to the deterrent.

3. Senator BILL NELSON. Admiral Johnson, what is the downside of delaying the W–76 life extension to see if the RRW is feasible?

Admiral JOHNSON. If the RRW is delayed or has significant problems, the W–76–0 will age out and Navy will have no replacement capability. If W–76–1 is produced in quantities to supply the minimum submarine outload in fiscal year 2012, then the RRW can replace the end of production of W–76–1 production requirement with minimum risk to the deterrent.

4. Senator BILL NELSON. Admiral Johnson, would the Navy work on a new arming, firing, and fuzeing system for the RRW 1 take place as part of phase 2A or phase 3?

Admiral JOHNSON. For all systems, the fuze is an integral part of the design and must be addressed during each phase of the development. Work defining top-level fuze requirements, operational modes, and preliminary designs occur in Phase 2. These requirements, operational concepts, and designs are further refined during Phase 2A in support of cost studies and in the development of acquisition and qualification strategies. Detailed design of the AF&F will take place in phase 2A since there was no specific Navy funding for the AF&F in fiscal year 2007. Phase 3 begins the engineering and manufacturing development phase where component-level requirements and subsystem designs are refined, and prototype hardware is produced for qualification and optimization for manufacture. The beginning of Phase 3 marks the real commitment to an effort which will be reflected in the need for resources.

B–52 BOMBER

5. Senator BILL NELSON. General Burg, what has changed since the National Defense Authorization Act (NDAA) for Fiscal Year 2007 authorized retirement of only 18 B–52 bombers, rejecting the request in the Quadrennial Defense Review (QDR) to transition to 56 B–52 bombers?

General BURG. There has been no significant change to the combatant commanders' conventional strike requirements or the overall security environment within the last year. However, the Air Force has been moving forward to enhance its long-range strike capability by implementing a comprehensive three-phased strategy which addresses near-term issues and prepares for future operational needs.

Phase I of this strategy is to modernize the remaining legacy bomber force. The B–1, B–2, and B–52 will undergo upgrades focused on sustainability, lethality, responsiveness, and survivability that enhance their capabilities to provide combat power for the combatant command (COCOM). For instance, in President's budget 2008 (fiscal year 2008–fiscal year 2013) the B–52 has the following enhancements programmed: Avionics Midlife Improvement (AMI), Advanced Weapons Integration (AWI), Combat Network Communication Technology (CONECT), Electronic Countermeasures Improvement (ECMI), and Miniature Air Launched Decoys (MALD). These upgrades will allow the B–52 to carry and employ the LITENING II advanced targeting pod, rapidly re-target J-series weapons in-flight, increase communications capability and connectivity, and provide enhanced capability against enemy threat systems. As well, the B–1 and B–2 are programmed to receive similar upgrades that will result in increasingly capable aircraft. In the near-term, the Air Force will present a more capable bomber force to the combatant commanders for their employment.

This modernized legacy bomber force will serve to mitigate the risk until Phase II of our long-range strike strategy fields the next generation bomber in 2018. Additionally, the Bomber Force Structure Study directed by Congress to be accomplished by the Institute for Defense Analyses is underway and we expect initial findings to be available by August 2007.

6. Senator BILL NELSON. General Burg, what are the changed circumstances or new information that would persuade Congress to authorize retirement of any additional B–52 bombers?

General BURG. There has been no significant change to the combatant commanders' conventional strike requirements or the overall security environment within the last year. However, the Air Force has been moving forward to enhance its long-range strike capability by implementing a comprehensive three-phased strategy which addresses near-term issues and prepares for future operational needs.

Phase I of this strategy is to modernize the remaining legacy bomber force. The B–1, B–2, and B–52 will undergo upgrades focused on sustainability, lethality, responsiveness, and survivability that enhance their capabilities to provide combat power for the COCOM. For instance, in President's budget 2008 (fiscal year 2008–fiscal year 2013) the B–52 has the following enhancements programmed: AMI, AWI, CONECT, ECMI, and MALD. These upgrades will allow the B–52 to carry and employ the LITENING II advanced targeting pod, rapidly re-target J-series weapons in-flight, increase communications capability and connectivity, and provide enhanced capability against enemy threat systems. As well, the B–1 and B–2 are programmed to receive similar upgrades that will result in increasingly capable aircraft. In the near-term, the Air Force will present a more capable bomber force to the combatant commanders for their employment.

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7. Senator BILL NELSON. General Burg, would the Air Force retire all 18 B–52s authorized to be retired in fiscal year 2008?

General BURG. The fiscal year 2007 program of record retired 18 B–52s, including 1 aircraft on loan to the National Aeronautics and Space Administration (NASA). In the NDAA for Fiscal Year 2007, Congress restricted the retirement of 17 of these aircraft until 45 days after the Secretary of the Air Force submits a bomber force structure study conducted by the Institute for Defense Analyses (IDA) to Congress. Only the aircraft on loan to NASA has not been restricted from retirement pending the IDA study. The IDA study should be briefed to the Air Force in August 2007, with formal report delivery to Congress by the end of fiscal year 2007. The 45-day waiting period pushes the earliest B–52 retirement into fiscal year 2008. As a result, the Air Force intends to retire all 17 aircraft during fiscal year 2008 following submission of the IDA study to Congress and the subsequent 45-day waiting period.

8. Senator BILL NELSON. General Burg, the B–52 draw down is part of a broader effort to reposition the B–52 aircraft between the two bases, one in Louisiana and one in North Dakota, and consolidate bomber delivered nuclear weapons. This is a long-term project. What is the likelihood that reductions and repositioning beyond the 18 would occur in fiscal year 2008, even if authorized?

General BURG. The NDAA for Fiscal Year 2007 language limited the Air Force to retiring not more than 18 B–52s and maintaining 44 B–52s as Combat Coded.

The Air Force has requested to divest 20 B–52s in the fiscal year 2008 President's budget, reducing the Total Active Inventory (TAI) to 56 B–52s. This program is based first on the ability of 56 TAI to meet any single COCOM requirement; second on the assessment that the operational risk associated with the retirements is acceptable; and third the need to recapitalize as a part of the Air Force's three-phase long-range strike (LRS) plan.

If Congress authorizes the divestiture of 20 B–52s in fiscal year 2008, the Air Force plans to reposition the aircraft as expeditiously as possible per the program of record. To remain in compliance with NDAA 2007 language while maintaining 56 aircraft TAI, the Air Force will place the 20 aircraft in "Excess to Command" status.

9. Senator BILL NELSON. General Burg, what is the minimum number of B–52 bombers needed to meet all plans and requirements?

General BURG. The B–52 program of record as presented in the fiscal year 2008 President's budget, retires 18 excess-to-need attrition reserve aircraft in fiscal year 2007 and another 20 aircraft in fiscal year 2008 for a Total Aircraft Inventory (TAI) of 56. The B–52 force structure of 56 TAI satisfies any single COCOM requirement, meets requirements for two near-simultaneous Major Combat Operations with swing of forces and enables recapitalization as part of the Air Force's three-phase LRS plan.

10. Senator BILL NELSON. General Burg, what is the utilization rate for the 74 non-attrition reserve B–52 bomber aircraft?

General BURG. The standard utilization (UTE) rate for the B–52 is 5.8 for the Active-Duty and 5.0 for the Reserves. UTE is calculated using programmed Primary Aircraft Inventory (PAI) and not Backup Aircraft Inventory (BAI). The Active Duty has 37 PAI and the Reserves 8 for a total of 45 aircraft; two other aircraft (also PAI) are with Air Force Materiel Command for test purposes. PAI and BAI total 54 aircraft. Fiscal year 2006 and fiscal year 2007 standard UTE rates are identical.

ACC	
PAI	37
BAI	6
AR (Attrition Reserve)	2
Reserve	
PAI	8
BAI	1
AFMC	
PAI	2
Totals	
PAI	47
BAI	7
AR	2
	56

The figure of 74 aircraft is based on the fiscal year 2006 President's budget force structure; an Air Force corporate decision, PBD 720, reduced that number to 56 as of the fiscal year 2007 President's budget.

11. Senator BILL NELSON. General Burg, what requirement for LRS aircraft is not being met by the current fleet of B–52, B–1, and B–2 bombers?

General BURG. Proliferation of advanced threat systems such as the SU–27, SU–30, SA–20, and S–400 are presenting survivability challenges for our legacy platforms and will eventually limit their capability to respond and persist in the high threat battle space of the future. The Next Generation Long-Range Strike (NGLRS) aircraft, which will be fielded in 2018, will provide a stealthy, persistent, responsive capability that can attack deep, heavily defended, fixed and mobile, high-value targets.

12. Senator BILL NELSON. General Burg, the NDAA for Fiscal Year 2007 directed the Air Force to maintain 44 combat coded B–52 bomber aircraft, which would require 74 total B–52 aircraft in inventory. The 44 combat coded aircraft was the minimum to meet requirements. Does the fiscal year request mean that the 44 combat coded aircraft can be met with only 56 B–52 bombers? What happened in the past 6 months to make this possible?

General BURG. The Air Force is requesting to reduce the number of B–52 aircraft in order to divest legacy aircraft for the purpose of modernization and recapitaliza-

tion. The Air Force's Air Combat Command (ACC) has stated that they can provide 44 Combat Coded (CC) aircraft with 56 TAI. There has been no significant change to the combatant commanders' conventional strike requirements or the overall security environment within the last year. With a reduced B–52 force, the Air Force will still retain the ability to meet any COCOM requirement from a total force perspective. The bomber's ability to swing from one AOR to another and the ability to introduce different force structures to provide the same effect will allow the Air Force to provide the forces to the COCOM to meet their requirements.

The fiscal year 2008 President's budget includes the planned retirement of 20 B–52s in fiscal year 2008. The NDAA for Fiscal Year 2007 language limited the Air Force to retiring not more than 18 B–52s and maintaining 44 B–52s as CC. To remain in compliance with NDAA for Fiscal Year 2007 language while maintaining 56 aircraft TAI, the Air Force will place the 20 aircraft in "Excess to Command Status."

13. Senator BILL NELSON. General Burg, a review of the various B–52 modernization programs indicates that the Air Force could support somewhere between 65 and 70 B–52 bombers with the current modernization funding and then only if the outyear funding for the Connect program were to be extended. How much would it cost to modernize all 76 B–52s?

General BURG. In order to modernize the current fleet of 76 B–52s, the fiscal year 2008 APAF funding required would be $19.02 million. Below are the breakout costs of modernizing the B–52s (cost in millions):

[In millions of dollars]

Advanced Weapons Integration	$5.51
MLR–2020 (ILS receiver)	1.41
Electronic Counter Measure Improvement (ECMI)	3.80
Avionics Midlife Improvement (AMI)	0
Enhanced Data Link	1.76
Digital Stability Augmentation Components	6.54

Fiscal year 2008 funding does not complete the following two modification efforts:
ECMI: Additional funding required to complete installation—fiscal year 2009 ($2.7 million) and
AMI: Additional funding required to support 76 AMI configured B–52s—fiscal year 2010 ($3.1 million).

HELICOPTERS FOR ICBM FIELDS

14. Senator BILL NELSON. General Burg, the helicopters that the Air Force uses to support the vast expanse of intercontinental ballistic missile (ICBM) fields are Vietnam-era and need to be replaced. What are the requirements for new helicopters and what are the plans to replace the old helicopters, including the estimated cost of the replacement?

General BURG. The UH–1N does not meet requirements directed in Nuclear Weapon Security Manual (Department of Defense (DOD) S–5210.41–M dated 22 November 2004), and it cannot be modified to meet Key Performance Parameters in speed, lift, range, and capacity. The Air Force safely maintains and operates the UH–1N and plans to continue to do so until a replacement program is fielded. The Air Force is pursuing the Common Vertical Lift Support Platform (CVLSP) as a replacement effort. CVLSP is currently unfunded; it is currently number six on the Air Force Chief of Staff's Unfunded Priority List (UPL). The Air Force has conducted a CVLSP Analysis of Alternatives (AoA) to study replacement options. The AoA Final Report is currently with OSD (PA&E) for sufficiency review. No reliable cost data is available because the replacement platform(s) have not been selected.

15. Senator BILL NELSON. General Burg, has the Air Force selected a replacement helicopter for the ICBM fields?

General BURG. The Air Force has not selected a replacement for the UH–1N. The CVLSP is an unfunded effort to replace the UH–1N. It is currently number six on the Air Force Chief of Staff's UPL. Air Force Space Command completed an AoA for the CVLSP. The AoA team evaluated 12 different material solutions and mixed fleet possibilities. The CVLSP AoA Final Report is currently with OSD (PA&E) for a sufficiency review.

QUESTIONS SUBMITTED BY SENATOR E. BENJAMIN NELSON

GLOBAL INNOVATION AND STRATEGY CENTER

16. Senator BEN NELSON. General Cartwright, the Global Innovation and Strategy Center (GISC) is a facility to bring together, in a cooperative effort, members of the public and private sector and to leverage the expertise of the participating members to provide global strategies, timely courses of action, and new operational tools and analyses in support of the Strategic Command (STRATCOM) mission. What is the current status of the GISC and are there accomplishments yet?

General CARTWRIGHT. The GISC became operational in September 2006 and has completed over 38 diverse projects. For example, the GISC successfully teamed with the State of Nebraska and the University of Nebraska in the development of a pandemic influenza predictive modeling and vaccine distribution program. The program was adopted by Nebraska and is under review by the Centers for Disease Control for applicability nationwide. Additionally, the GISC teamed with Johns Hopkins University Applied Physics Lab to develop software that leverages the national satellite systems to produce actionable intelligence that previously may have gone unnoticed. This information was supplied to the Commander, Pacific Air Forces and successfully transitioned to the Air Force for integration into the Distributed Common Ground System. The GISC is also working on projects to help redefine global deterrence in the 21st century that have already proven useful. We view these example projects and more as accomplishments.

17. Senator BEN NELSON. General Cartwright, can you describe the collaborations with the university community in Nebraska as well as the private sector?

General CARTWRIGHT. In addition to collaborating with the University of Nebraska community on pandemic influenza modeling, the GISC implemented an intern study program. This USSTRATCOM "first" leverages the academic rigor of a small, cross-disciplinary University of Nebraska academic team to take a fresh, unclassified look at tough issues confronting the Command and the Nation. The GISC recently completed its first intern study project, which looked at communications transmission in the Pan Sahel of Africa. Furthermore two intern study groups will begin in the fall, leveraging academic teams from the University of Nebraska Omaha and the Peter Kiewit Institute. Eventually the GISC will leverage national and international academic teams to evaluate similar timely issues. The GISC recently hosted a first of its kind Global Leadership Conference bringing private sector CEOs together with the military to gain a perspective on collaborating and working future issues. Our objective is to utilize cross organization and disipline collaboration to develop new strategies for our most difficult problems. This peering, self-organized effort bypasses vertical closed approaches, and physical and regional artificial boundaries to generate innovation.

18. Senator BEN NELSON. General Cartwright, obviously, GISC is still evolving; what do you foresee for the future?

General CARTWRIGHT. Globalization has given us unique challenges but it has also given us opportunities to access information that will enable us to have new knowledge discovery by using the latest technologies, large network bandwidth, and a global approach. This structure allows the GISC to think and act globally; break down artifical closed, vertical, physical, regional boundaries; create peering relations; and foster self-organized functional activites. The GISC is an organization where Government, industry, and academia can come together and tackle the Nation's toughest problems in an environment that is conducive to information sharing with an innovative global perspective.

19. Senator BEN NELSON. General Cartwright, the February 6, 2006, QDR assigned STRATCOM lead responsibility to operate and protect the Department's Global Information Grid (GIG). That's a part of STRATCOM's Information Operations (IO) mission. Can you describe what that means—"operate and protect" the GIG?

General CARTWRIGHT. Defending the GIG implies only defending the DOD. We defend the Nation by layered defense off shore in partnership with Homeland Security on shore. Operating and defending the GIG means providing the framework, policy, guidance, and supervision to all users on the DOD's networks to ensure we are protecting our greatest resource: information. Employing an overall strategy of defending the GIG and the information it contains, USSTRATCOM employs a proactive preventive capability and flexible, rapid, and aggressive response actions. Our concept of Computer Network Defense (CND) depends upon situational awareness of

the network environment, predictive warning of impending attacks, defensive tools, and measures to defeat attacks when they occur. Out intent is to assure timely and secure net-centric capabilities in support of DOD's full spectrum of warfighting, intelligence, and business missions. Operating and defending the GIG means employing a defense-in-depth approach that is routinely validated and enhanced through rigorous full-dimensional exercises across the DOD. Over the last 2 years, we've made tremendous headway in deterring and reducing the number of intrusions.

20. Senator BEN NELSON. General Cartwright, Barksdale Air Force Base has a brand new Global Cyberspace Innovation Center. What is the relationship between the GIG and those activities?

General CARTWRIGHT. Eighth Air Force, headquartered at Barksdale Air Force Base, is the Numbered Air Force Component assigned to provide Air Force cyber and global strike capabilities to USSTRATCOM. Barksdale Air Force Base hosts the Air Force Network Operations Center and STRATCOM's Air Operations Center. The local Shreveport-Bossier community established a "Cyberspace Innovation Center" to organize local industry and academia cyberspace efforts and integrate them into the nationwide network of innovation centers of excellence. The focus areas of the Cyberspace Innovation Center are cyber research and development, public law and policy, and training and education. The Center will take advantage of existing state-of-the-art resources such as the Louisiana Consortium for Education, Research, and Technology and the Louisiana Optical Network Initiative to provide very high bandwidth, virtual collaboration between partners.

QUESTIONS SUBMITTED BY SENATOR MARK PRYOR

NUCLEAR CAPABILITIES

21. Senator PRYOR. General Cartwright, our missile defense system is an important response to the challenges of ballistic missile proliferation. How do we extend deterrence or enhance defenses against the ballistic missile threat for our deployed forces and allies?

General CARTWRIGHT. Global integration of regional missile defense capabilities with our allies is crucial to enhancing and extending global deterrence. We continue to rely on the Patriot missile system for defense of deployed forces while we work to build additional capabilities. The Missile Defense Agency, with essential warfighter input, is developing and testing additional ground- and sea-based systems that complement this system and will provide the robustness and redundancy we require to defend our allies and deployed forces. Allies are also active participants in providing protection against ballistic missile threats as they continue to expand cooperative programs with the U.S. Government. Japan's purchase and fielding of missile defense systems and the desire of European countries to host forward deployed radars and interceptors provide evidence of ally aspirations to protect their homeland. Active defense forces are but one piece of the solution; we also look to attack operations, passive defense, and nonkinetic options to meet the threat.

22. Senator PRYOR. Mr. D'Agostino, it is imperative to national security to ensure the safety, security, and effectiveness of our nuclear stockpile. How do we validate the reliability of new modular and interoperable nuclear warheads under the RRW program?

Mr. D'AGOSTINO. The NNSA design laboratories (with Lawrence Livermore as the lead laboratory) will employ the same broad approach used to verify the continued performance of existing warheads. The laboratories will conduct integrated experiments, develop models, and use computational analysis to quantify performance margins and assess uncertainties.

The designers have identified and understand the key performance parameters for RRW would be designed utilizing archived nuclear test data. The RRW will be designed so that these key performance parameters arc farther away from failure points (have greater margin) than the current Cold War warheads designed for high yield to weight. This approach would give designers higher confidence in their ability to certify the design without underground nuclear tests. Years of experience studying materials and manufacturing processes, and with capabilities developed as part of the Stockpile Stewardship Program, combined with past nuclear test data, provide a basis for designers to address known areas of uncertainty. Improved warhead performance margins that would be incorporated into the replacement warhead design will reduce uncertainty due to aging, and reduce the likelihood that underground nuclear testing will be required in the future to resolve a technical prob-

lem in the stockpile. The quantification of margins and uncertainties (QMU). for key performance parameters would aid in understanding the limits of the performance and be the basis for the laboratory directors' certification of a RRW design.

23. Senator PRYOR. Mr. D'Agostino, the NNSA has said that the acquisition of nuclear weapons, weapons of mass destruction (WMD) capabilities, technologies, and expertise by rogue states or terrorists stands as one of the most potent threats to the United States and international security. What is your plan to address these threats?

Mr. D'AGOSTINO. The overall strategy to protect the United States from rogue state and terrorist nuclear weapons threats has seven components:

- Determine intentions, capabilities, and plans to develop or acquire nuclear weapons;
- Deny access to nuclear materials, expertise, and technologies required to develop nukes;
- Detect and disrupt attempted movement of nuclear materials, weapons, personnel;
- Deter nuclear attack;
- Prepare for and respond to nuclear attack;
- Define the nature and source of a terrorist-employed nuclear device; and
- Disarm and dispose of a terrorist nuclear device.

Prevention is the key to an effective strategy. The NNSA is working intensively to assist overall U.S. efforts to prevent acquisition of nuclear devices and fissile materials by rogue states and terrorists by:

- Strengthening physical security of U.S. nuclear weapons and weapons usable materials;
- Providing assistance to Russia to strengthen protection, control, and accounting of its nuclear weapons and materials;
- Working with friends and allies to secure weapons-usable nuclear materials worldwide, and to strengthen security at civil nuclear facilities; and
- Taking more aggressive steps to interdict illicit trafficking in weapons-usable nuclear materials and related technologies via strengthened export controls, cooperation with other countries through Second Line of Defense and MegaPorts programs, and the Proliferation Security Initiative.

Attribution, or the capability to rapidly characterize and identify the source of a nuclear warhead or weapons usable nuclear materials either before or after an attack, is a vital component of our overall strategy to deter nuclear terrorism. This is for the reason that it is far less likely that a stale will provide nuclear weapons to terrorists if it knows that there is a strong likelihood that we will attribute the weapon to that state, and that we are fully able to retaliate on the source. During the period of nuclear testing NNSA developed a national capability for technical nuclear forensics to support its own test program and to understand the nature of non-U.S. nuclear tests. This capability, developed over a period of decades during the Cold War, is critical to attribution of terrorist nuclear threats. Among other things, the NNSA is developing a concept of operations to assess origin of an interdicted nuclear device; and is also working to ensure that the capabilities exist at our national laboratories for pre- and post-detonation forensics assessments.

Through its national laboratory system the Department of Energy (DOE) deploys highly-trained learns of experts to search for clandestine nuclear materials or warheads and to disarm and dispose of a terrorist nuclear device. These teams work in concert with elements of the DOD, DHS, and the FBI to provide the total national response to nuclear terrorism.

24. Senator PRYOR. General Burg, how do we reduce our ICBM nuclear arsenal without compromising our strategic deterrent posture?

General BURG. On 16 March 07, the Air Force provided a detailed report on ICBM force modernization in response the guidance contained in section 139 of the NDAA for Fiscal Year 2007 (P.L. 109–364). We are forwarding through classified channels an excerpt from this report that addresses the United States' strategic deterrent posture.

25. Senator PRYOR. Admiral Johnson, nuclear propulsion plays a vital role in our Navy's effective forward presence throughout the world. How can we ensure their continued safe, reliable, and long-lived operation?

Admiral JOHNSON. The Director, Naval Nuclear Propulsion Program, has statutory authority for oversight and direction of all aspects of naval nuclear propulsion. U.S. nuclear-powered warships have safely operated for more than half a century

without experiencing any reactor accident or any release of radioactivity that had an adverse effect on human health or the quality of the environment. The program has consistently limited personnel radiation exposure more stringently than the civilian nuclear power industry or other Government nuclear programs. No civilian or military personnel in the Naval Nuclear Propulsion Program have ever exceeded the Federal lifetime radiation exposure limit or the Federal annual limit in effect at the time.

Naval reactors' safety standards are mainstreamed across all organizations in the Naval Nuclear Propulsion Program, from headquarters to equipment suppliers, contractors, laboratories, shipyards, training facilities, and the fleet. Continued safe and reliable operation is ensured through the long-term, deliberate investment in the material, design, and operational standards that characterize the Naval Nuclear Propulsion Program.

QUESTIONS SUBMITTED BY SENATOR JEFF SESSIONS

RESPONSIVE NUCLEAR INFRASTRUCTURE

26. Senator SESSIONS. General Cartwright, the Nuclear Posture Review (NPR) called for the development of a "responsive nuclear infrastructure." Have the DOD and the DOE ever formalized a definition of "responsive"?

General CARTWRIGHT. The June 2004, Report to Congress, A Revised Nuclear Weapons Stockpile Plan for 2012, submitted by the Secretary of Defense and Secretary of Energy defines "responsive" as, ". . . the resilience of the nuclear weapons enterprise to unanticipated events or emerging threats, and the ability to anticipate innovations by an adversary and to counter them before our deterrent is degraded all the while continuing to carry out day-to-day activities in support of the stockpile." The DOD continues to work with the DOE on quantitative metrics.

27. Senator SESSIONS. General Cartwright, what performance metrics are used to measure "responsiveness"?

General CARTWRIGHT. The June 2004, Report to Congress, A Revised Nuclear Weapons Stockpile Plan for 2012, submitted by the Secretary of Defense and Secretary of Energy defines responsive nuclear infrastructure. The DOD continues to work with the DOE on quantitative metrics to include:

1) Time to fix stockpile problems;
2) Time to adapt weapons by modifying or repackaging existing warheads;
3) Time to design, develop, and begin production of a new warhead;
4) Production capacity levels;
5) Force augmentation service levels; and
6) Test readiness posture.

28. Senator SESSIONS. General Cartwright, how often is the performance of the nuclear weapons complex assessed against these metrics and by whom? To whom is the performance reported?

General CARTWRIGHT. Through the Nuclear Weapons Council, DOD and NNSA constantly and jointly monitor progress toward meeting responsiveness objectives. In fact, NNSA provides quarterly reports to the Nuclear Weapons Council.

29. Senator SESSIONS. General Cartwright, is cost effectiveness, or delivering products for a predicted cost target, one of the measures of performance?

General CARTWRIGHT. Cost is a measure of performance for program execution. Infrastructure responsiveness impacts cost and schedule. One of the responsiveness objectives is to ensure an economically sustainable nuclear weapons enterprise.

30. Senator SESSIONS. General Cartwright, in your view, what progress has been made in the last 5 years on the development of a "responsive" infrastructure?

General CARTWRIGHT. The NNSA has begun to transform the nuclear weapons complex. In 2006, NNSA developed the Complex 2030 Transformation Plan and established the Office of Transformation to transform the nuclear weapons complex. Recent accomplishments include: initiating tritium extraction operations, increasing throughput at Pantex and Y12 plants, starting modernization and construction projects for critical scientific and production facilities, and creating a systems integration structure to improve efficiency and responsiveness. The completion of the detailed cost and design study for the first RRW is another critical milestone for

transformation. We support NNSA's nuclear complex transformation efforts but recognize much work remains to be done.

COST OF RELIABLE REPLACEMENT WARHEAD VERSUS THE CURRENT PATH

31. Senator SESSIONS. Mr. D'Agostino, is the DOE preparing a detailed analysis of the cost differential between the development and deployment of a stockpile based on the RRW versus the cost of continuing with life extension programs into the foreseeable future?

Mr. D'AGOSTINO. Yes. We are using computer models of the nuclear weapons complex enterprise to bound probable costs for a variety of different scenarios that include a comparison of Life Extension Program (LEP) and RRW stockpiles. The models indicate long-term economic benefits for an RRW-based stockpile. However, because we are in the early stages of finalizing the RRW and facility designs the detailed costs associated with RRW development and deployment. Utilization of the RRW design enables the elimination of certain hazardous operations and a reduced suite of production capabilities that would have to be retained and refurbished to support an LEP stockpile strategy. The RRW Phase 2A will provide the baseline cost of a first design but it will not be completed before the end of fiscal year 2008.

32. Senator SESSIONS. Mr. D'Agostino, when will this analysis be completed and presented to Congress?

Mr. D'AGOSTINO. Assuming we are authorized and appropriated by Congress to continue design definition and detailed RRW cost analysis, Phase 2A, we should be able to present the detailed cost differential between the different stockpile scenarios in late 2008.

33. Senator SESSIONS. Mr. D'Agostino, do you think pursuit of the RRW might be the less expensive option and, if so, why?

Mr. D'AGOSTINO. Based upon the enterprise modeling results we have now, we expect a stockpile option based on RRW concepts to be less expensive than a LEP stockpile option over the next several decades. Since a primary objective of RRW development is to increase design margins in order to ensure warhead reliability while reducing the potential need for an underground nuclear test, we intend to pursue RRWs in a manner that makes them easier to manufacture, certify, and maintain, as well as decrease the need for large numbers of augmentation warheads. The RRW strategy is also intended to take intrinsic safety and warhead security to a level that is not possible to incorporate into an existing Cold-War design. All of these are expected to reduce long-term costs.

COMPLEX 2030 ALTERNATIVES

34. Senator SESSIONS. Mr. D'Agostino, how confident are you that the range of alternatives being considered under the Complex 2030 plan encompasses the full range of downsizing or facility consolidation that will be appropriate for the nuclear weapons complex of the future—one which supports a much smaller stockpile?

Mr. D'AGOSTINO. I am quite confident that we are considering the full range of reasonable downsizing or facility consolidation alternatives as part of our complex transformation planning. For example, we are evaluating alternatives ranging from no action to a consolidated nuclear production center (CNPC) in our Complex Transformation Supplemental Programmatic Environmental Impact Statement and supporting business case analyses. A CNPC would consolidate all nuclear component manufacturing and weapon assembly/disassembly operations to one site. In addition, we are considering intermediate nuclear production alternatives that range from downsizing-in-place at three sites to consolidating to two sites. We are also analyzing the impacts of a smaller stockpile in the event that national security requirements are revised.

35. Senator SESSIONS. Mr. D'Agostino, do you think the "tough" decisions about the future of some of these facilities can really be made without an external body, such as a Base Realignment and Closure (BRAC) Commission, doing an evaluation?

Mr. D'AGOSTINO. Yes, I believe that we will be able to make the tough decisions. NNSA is evaluating all reasonable alternatives and using external groups that include officials who have BRAC experience. With the support of Congress, I anticipate making a number of tough decisions. Given the age of the NNSA production complex, and the associated high maintenance and security costs, we need to transform expeditiously. Our analyses show that delay is costly. It does not seem likely

that a BRAC could be authorized, organized, and complete its evaluations in sufficient time to provide benefits that outweigh the cost and risk of delays.

BUSINESS PRACTICES OF THE NUCLEAR WEAPONS COMPLEX

36. Senator SESSIONS. Mr. D'Agostino, do you think there would be value in having an independent group or commission review the business practices of the nuclear weapons complex to search for efficiencies and other improvements to the way business is conducted in the complex?

Mr. D'AGOSTINO. Several independent groups have already conducted reviews of various operations within the nuclear weapons complex to include the business practices. These groups include the Secretary of Energy Advisory Board's Recommendation for the Nuclear Weapons Complex of the Future, the National Research Council, the DOE Inspector General and the Government Accountability Office. From these reviews, we have identified certain business areas to focus on for further efficiencies and improvements. As an example, NNSA has implemented the Supply Chain Management Center to consolidate and streamline procurement actions across the complex. Improvements in program and project management and cost estimating practices are also of particular interest. Further external, independent reviews of these practices may be beneficial after implementation, when results have been achieved.

37. Senator SESSIONS. Mr. D'Agostino, many corporations have been able to improve their operations through such reviews—such as Lean Six Sigma, quality process improvement, and other corporate initiatives. Do you have any such reviews currently ongoing? If so, do you have any results that you can share with the committee?

Mr. D'AGOSTINO. In the Nuclear Weapons Complex, several reviews and initiatives have been conducted to improve processes and business practices. Examples of some major improvement initiatives are the Pantex Throughput Improvement Plan (PTIP) and the Y–12 Throughput Improvement Plan (YTIP). Both quality process improvement plans takes a fresh look at nuclear production operations and then changes those practices that are considered unnecessary and inefficient. Specific accomplishments have enabled increasing the weapon dismantlement rates more than 146 percent over previous year's rate. Quality improvement methods have also been applied in other areas such as non-nuclear production at the Kansas City Plant, warhead disassembly and inspection at Pantex, and neutron generator production at Sandia National Laboratories (SNL). By applying Lean Six Sigma techniques, SNL has increased capacity by 67 percent, reduced inventory by 55 percent, and realized cycle time reductions of up to 75 percent. In the business area, NNSA has optimized its procurement and spend management by implementing corporate initiative of the Supply Chain Management Center in fiscal year 2007. By applying industry best business practices of strategic sourcing and eProcurement, NNSA will deliver procurement process efficiencies and cost avoidances (estimated at 1 percent of annual contractor spend or $30 million annually).

ADMINISTRATIVE COSTS OF THE NATIONAL NUCLEAR SECURITY ADMINISTRATION

38. Senator SESSIONS. Mr. D'Agostino, the fiscal year 2008 budget request seeks $395 million for the salaries, benefits, and other administrative costs of the Federal operations of the NNSA, an increase of $54 million over fiscal year 2007. Could you please describe the justification and purpose of this increase?

Mr. D'AGOSTINO. The $54 million increase is the difference between the fiscal year 2008 President's budget and the initial fiscal year 2007 appropriation of $341 million under the fiscal year 2007 year-long Continuing Resolution. The current fiscal year 2007 level in this account has been increased by an appropriation transfer of $17 million, to a total of $358 million, so the increase to the fiscal year 2008 President's budget request is actually $37 million.

Receiving the full fiscal year 2008 budget request level of $395 million is essential for NNSA to recover a viable operations level following the severe funding constraints during fiscal year 2007. Over 70 percent of the total request is for Federal salaries and benefits, and over half of the fiscal year 2008 increase is in this area to cover increase in benefits costs, including the Federal Cost-of-Living adjustment. The President's budget request will allow NNSA to lift the hiring freeze and begin to again acquire critical skill personnel to support rapidly expanding mission programs, including Defense Nuclear Nonproliferation. Achieving this increase is vital at this time so that NNSA can expand hiring to position the overall organization

to replace large numbers of managers and senior staff expected to begin NNSA's retirement "bow wave" in the next 18 months.

The remaining 30 percent of the President's request is for "non-payroll" costs. This would restore a prudent level—about 5 percent growth—in travel needed to support expanding international program work. Funding for support services contracting would stay essentially flat with the levels achieved in fiscal year 2007, with internal reprioritization to meet emerging mission program needs. Funding at the President's request level will allow us to fully fund departmental assessments for space, occupancy, and corporate systems, meet increased requirements and costs for Federal information technology equipment and systems, and continue to fund our commitments to the Historically Black Colleges and Universities programs that had to be "gapped" because of funding shortages during fiscal year 2007.

Because of the severe funding constraints in this account in fiscal year 2007, Federal employment levels are currently slightly below projections, and with funding at the President's request and aggressive hiring, NNSA can return to the hiring curve needed to address the current and future needs of the national security enterprise.

NATIONAL TECHNICAL NUCLEAR FORENSICS

39. Senator SESSIONS. Mr. D'Agostino, the fiscal year 2008 budget requests funding for a new initiative called National Technical Nuclear Forensics (NTNF). This funding will establish a capability to support post-detonation activities in the event of a nuclear WMD attack and will enhance technical nuclear forensics capabilities. What capabilities would be developed with this funding that do not already exist at the nuclear weapons labs?

Mr. D'AGOSTINO. NTNF provides information that is critical to the larger issue of attribution. Post-detonation nuclear forensics is directed by National Security and Homeland Security Presidential Directives: "Maintain nuclear materials and weapons expertise and nuclear forensics capabilities including nuclear device, IND, and RDD concept and design information through appropriate restricted data nuclear weapon data controls as appropriate." With the additional funding requested for fiscal year 2008, NNSA will enhance its radiochemistry analytical capabilities to be able to provide more quickly the information that is essential for determining a device's design and the source of the materials used. These capabilities include expanding laboratory capacity (to handle more samples more quickly), improving laboratory processes (to achieve, for example, streamlined analyses), enhancing device modeling capabilities, improving knowledge management of the technical information contained in materials databases, and providing better attribution tools.

PROMPT GLOBAL STRIKE

40. Senator SESSIONS. Admiral Johnson, you note in your prepared statement the $175 million request to provide an initial capability for the Conventional Trident in 2010. Is the Navy examining other long-range conventional strike capabilities that could be employed on a surface ship or submarine?

Admiral JOHNSON. Yes, the Navy is examining other conventional strike solutions to provide CDRSTRATCOM with Prompt Global Strike capability. Congress provided funds in fiscal year 2005 and fiscal year 2006 which allowed the Navy to demonstrate new low-cost solid rocket motor technology for a smaller scale "intermediate" range ballistic missile. Leveraging this work, the Navy has been studying a concept for a longer range (~3500 nm) Global Strike Missile that could be deployed initially on the four SSGN submarines, and considered for later deployment in the SSBN fleet alongside the D5 system. The conceptual Submarine Launched Global Strike Missile (SL–GSM) is one of several alternatives currently being assessed under the Air Force lead Prompt Global Strike (PGS) Analysis of Alternatives. Both the intermediate range (~1500 nm) and global range (~3500 nm) missile concepts are only being assessed for employment from submarines. Other surface ship strike options are available for shorter 'tactical' ranges (<1000 nm). The Conventional Trident Modification is the only 'long-range' (>4000 nm) conventional strike capability that could be rapidly developed and deployed to deliver Prompt Global Strike.

41. Senator SESSIONS. Admiral Johnson, I understand these options cannot be fielded as quickly as the conventional trident missile (CTM). What other options might be available?

Admiral JOHNSON. The Conventional Trident Modification is the only conventional strike system that could be rapidly developed and deployed to deliver Prompt Global

Strike capability. The Submarine Launched Global Strike Missile (SL–GSM) concept could not be developed and fielded as quickly as the CTM capability. Initial studies indicate a SL–GSM system could be developed, tested, and deployed on the SSGN in approximately 5 years from initial funding. The SL–GSM concept delivers a terminally-guided large single warhead to ~3500 nm with a range of kinetic effects including penetrating capability to defeat hard and deeply buried targets. While formal budget quality numbers are still being developed, an SSGN only capability is estimated to cost approximately $2.5–3.0 billion to develop, test, procure, and deploy SL–GSM on all SSGN submarines.

UNITED KINGDOM NUCLEAR MODERNIZATION

42. Senator SESSIONS. Admiral Johnson, the United Kingdom plans to spend $40 billion to modernize its nuclear deterrent by creating a new generation of nuclear submarines to carry American-supplied Trident missiles. The current force of 4 Vanguard-class submarines each carry 16 Trident long-range ballistic missiles with British nuclear warheads. What role, if any, will the United States play in the United Kingdom's modernization effort?

Admiral JOHNSON. The 7 December 2006 exchange of letters between President Bush and Prime Minister Blair reaffirmed the United States commitment to support the missile system and associated equipment deployed by the United Kingdom. President Bush confirmed the United States will support the United Kingdom participation in the life-extension program for the Trident II D5 missile and associated equipment, under the continuing framework of the Polaris Sales Agreement and the 1982 Exchange of Letters.

[Whereupon, at 12:07 p.m., the subcommittee adjourned.]

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2008

WEDNESDAY, APRIL 11, 2007

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

BALLISTIC MISSILE DEFENSE PROGRAMS

The subcommittee met, pursuant to notice, at 3:12 p.m. in room SR–232A, Russell Senate Office Building, Senator Bill Nelson (chairman of the subcommittee) presiding.

Committee members present: Senators Bill Nelson, Reed, Inhofe, Sessions, and Thune.

Majority staff members present: Madelyn R. Creedon, counsel; Richard W. Fieldhouse, professional staff member; and William G.P. Monahan, counsel.

Minority staff members present: Gregory T. Kiley, professional staff member; and Robert M. Soofer, professional staff member.

Staff assistants present: Kevin A. Cronin and Benjamin L. Rubin.

Committee members' assistants present: David E. Bonine, assistant to Senator Byrd; Elizabeth King, assistant to Senator Reed; Christopher Caple, assistant to Senator Bill Nelson; M. Bradford Foley, assistant to Senator Pryor; and Stuart C. Mallory, assistant to Senator Thune.

OPENING STATEMENT OF SENATOR BILL NELSON, CHAIRMAN

Senator BILL NELSON. This Subcommittee meets to hear from a very distinguished panel. Our witnesses are Lieutenant General Obering, Lieutenant General Campbell, Dr. Charles McQueary, Brian Green, and Paul Francis.

All of you have prepared statements. They will be entered in the record and we will keep the hearing record open for 3 days to allow members to submit statements or questions for the records.

We're going to discuss several key issues. The Government Accountability Office (GAO) has raised a number of important acquisition issues related to improved oversight and accountability of our missile defense programs and we want to see how we can improve these programs.

Last year, Congress enacted a provision of law that requires the Department of Defense to place a priority on the development, test-

ing, fielding, and improvement of effective near-term missile defenses. We want to learn how the Department has implemented that requirement.

There are many questions about a proposed deployment in Europe of long-range interceptors and associated radars and we need to explore those questions. Since we all want our missile defense systems to work in an operationally-effective and cost-effective, and suitable manner, we need to discuss some of the important testing issues.

So, we're going to dig into this in detail. My preference is that since we have your prepared statements already entered into the record, there's no sense for you to sit there and re-read it to us. So, we want you to talk to us.

I turn to our ranking member, Senator Sessions.

[The prepared statement of Senator Bill Nelson follows:]

PREPARED STATEMENT BY SENATOR BILL NELSON

Good afternoon. The subcommittee meets this afternoon to consider the ballistic missile defense programs of the Department of Defense.

Our witnesses today are:

- Lieutenant General Henry Obering, U.S. Air Force, Director of the Missile Defense Agency;
- Lieutenant General Kevin Campbell, U.S. Army, Commander of the Army Space and Missile Defense Command, and Commander of the U.S. Strategic Command Joint Force Component Command for Integrated Missile Defense;
- The Honorable Dr. Charles McQueary, Director of Operational Test and Evaluation, an independent organization at the Pentagon;
- Brian Green, Deputy Assistant Secretary of Defense for Strategic Capabilities, within the Office of the Under Secretary of Defense for Policy; and
- Paul Francis, Director of Acquisition and Sourcing Management at the Government Accountability Office (GAO), who directed the recent GAO report on missile defense acquisition strategy.

All the witnesses have submitted prepared statements and, without objection, your prepared testimony will be entered into the record in full. We will keep the hearing record open for 3 days to allow members to submit statements or questions for the record.

There are several key issues we want to discuss today:

The GAO has raised a number of important acquisition issues related to improved oversight and accountability of our missile defense programs, and we want to see how we can improve those programs.

Last year, Congress enacted a provision of law that requires the Department of Defense to place a priority on the development, testing, fielding, and improvement of effective, near-term missile defenses. We want to learn how the Department has implemented that requirement.

There are many questions about a proposed deployment in Europe of long-range interceptors and associated radars, and we need to explore those questions.

Since we all want our missile defense systems to work in an operationally-effective, cost-effective, and suitable manner, we need to discuss some important testing issues.

We want to have a good discussion today about missile defense, so I would ask the witnesses to provide very brief oral summaries, highlighting just a few key points of their testimony. There is a possibility of a closed session, if we need to discuss classified matters.

STATEMENT OF SENATOR JEFF SESSIONS

Senator SESSIONS. Thank you, Senator Nelson, and for your leadership. I've enjoyed working with you on this subcommittee and you understand these issues and care about them, committing the kind of time and efforts necessary for us to fulfill our responsibilities.

I want to welcome our witnesses and thank them for their service to our country. We've come a long way on missile defense over the past few years and we have these gentlemen and others ahead of you and working under you now, to thank for the progress that's been made.

If you look back just 3 years ago, we only had the Patriot antimissile system to provide defense, only against short-range missile threats like we utilized that Patriot system in Israel against SCUDs. Today, our homeland, deployed forces, and allies enjoy a limited measure of protection against the full range of short and long-range ballistic missile threats. We're making some good progress indeed, in a few years. Many thought it could never be done.

Mr. Chairman, in reviewing the press that's leading up to this year's deliberations, I get the sense that there may be three significant issues that we will need to discuss this year.

First, how much are we going to spend on overall missile defense programs? Second, what is the proper balance between testing and fielding additional capabilities? Third, whether to proceed with plans to field a ground-based interceptor (GBI) site in Central Europe?

On the issue of spending, the budget, as submitted by the administration, is already tight. I would point out that the fiscal year 2008 request of $8.9 billion for the full panoply of missile defense programs is almost $500 million below last year's appropriated level. It also represents the development, testing, fielding, and sustainment of not just our single Ground-Based Midcourse Defense (GMD) System that we talked a lot about and gets the most publicity, but a number of systems based on land, on our ships at sea, and in the air, which are capable of defending against a broad spectrum of short-, medium-, and long-range ballistic missile threats.

Seen in this light, the budget request compares I think, favorably with the full suite of aircraft, for example, being acquired by the Department of Defense. There is some concern expressed that missile defense undergo adequate testing before deployment, particularly the GBI.

While I support rigorous testing, we must remember why Congress approved close to simultaneous fielding and testing GBIs. It was because of our total vulnerability to long-range ballistic missiles. The North Korean ballistic missile test last July, coupled with Iran's ballistic missile development, and a launch of a sounding rocket in November, confirmed the wisdom, I think, of that approach.

Furthermore the successful intercept test on the GMD system last September, in addition to similar successful tests of the Patriot, SM–3, and Terminal High Altitude Area Defense (THAAD) systems—all in this, included in this funding request—suggest there's no reason to curtail planned fielding efforts even while we rigorously operationally test these systems.

Finally, some in Congress have questioned—I don't know on this side—but have questioned strategic rational for a GBD site in Europe, which will provide protection for most of Europe and the United States against the growing long-range ballistic missile

threat by Iran. I ask my colleagues to consider this initiative in the broader context of our defense strategy, and would note that just last month, Iran held 15 British citizens hostage. With ballistic missiles armed with weapons of mass destruction, Iran could hold entire cities, even nations hostage. A European continent vulnerable to Iranian ballistic missile threats could weaken the west's resolve in what is shaping up to be a clash of wills with Iran.

So, Mr. Chairman, thank you again for your leadership, your courtesy to me, and all of us on this subcommittee, and I look forward to the hearing.

[The prepared statement of Senator Sessions follows:]

PREPARED STATEMENT BY SENATOR JEFF SESSIONS

Thank you, Mr. Chairman. I also welcome today's witnesses and thank them for their service on behalf of the country. We have come a long way on missile defense over the past few years and we have these gentlemen and the men and women whom they represent to thank. If we look back just three years ago, we had only the Patriot anti-missile system to provide defense against short-range missile threats. Today, our homeland, deployed forces, and allies enjoy a limited measure of protection against the full range of short- to long-range ballistic missile threats. We are making very good progress, indeed.

Mr. Chairman, in reviewing the press leading up to this year's deliberations, I get the sense there may be three significant issues to address this year: First, how much are we going to spend overall on missile defense programs; second, what is the proper balance between testing and fielding additional capabilities; and third, whether to proceed with plans to field a ground-based interceptor site in Central Europe?

On the issue of spending, I would point out that the fiscal year 2008 request of $8.9 billion is almost $500 million below last year's appropriated level and represents the development, testing, fielding, and sustainment of not just a single missile defense weapon system, but a number of systems based on land, at sea, and in the air—and capable of defending against the broad spectrum of short-, medium-, and long-range ballistic missile threats. Seen in this light, the budget request is not unreasonable and compares favorably with, say, the full suite of aircraft being acquired by the Department of Defense.

Some of my colleagues insist that missile defenses undergo adequate testing before deployment, particularly the ground-based interceptor. While no one argues against rigorous testing, we must remember why the Administration, with Congressional approval, chose to simultaneously field and test ground-based interceptors—it was because of our total vulnerability to long-range ballistic missiles. The North Korean ballistic missile tests last July, coupled with Iranian ballistic missile development and the launch of a sounding rocket in November, confirm the wisdom of this approach.

Furthermore, the successful intercept test of the ground-based mid-course defense system last September, in addition to similar successful tests of the Patriot, SM–3, and THAAD systems, suggests there is no reason to curtail planned fielding efforts even while rigorous operationally realistic testing continues.

Finally, some in Congress are beginning to question the strategic rationale for a ground-based interceptor site in Europe to provide protection for most of Europe and the United States against the growing long-range ballistic missile threat posed by Iran. I ask my colleagues to consider this initiative in the broader context of NATO's diplomatic and military strategy for dealing with Iran. Last month, Iran held 15 British citizens hostage; with ballistic missiles armed with weapons of mass destruction, Iran could hold entire cities hostage. A European continent vulnerable to Iranian ballistic missile threats could weaken the West's resolve in what is shaping up to be a clash of wills with Iran.

Mr. Chairman, I look forward to hearing from the witnesses and working through these issues with you as we approach mark-up.

Senator BILL NELSON. General Obering?

STATEMENT OF LT. GEN. HENRY A. OBERING, III, USAF, DIRECTOR, MISSILE DEFENSE AGENCY

General OBERING. Good afternoon, Mr. Chairman, Senator Sessions, and distinguished members of the subcommittee. I'm honored to have this opportunity. I ask that my written statement be entered into the record and this afternoon I would like to summarize very briefly four key points.

First, ballistic missile threats are real and growing. Now is not the time to cut back America's efforts to defend our homeland, our deployed forces, our allies, and friends from these threats.

Second, the integrated layered missile defense system that thousands of Americans have been developing, fielding, and deploying, works, and is having an operational impact.

Third, we are developing and fielding missile defense capability at an unprecedented pace within our budget constraints.

Fourth, we are gaining widespread international support and cooperation. In the last year we have seen aggressive ballistic missile development and test efforts in North Korea and Iran, as well as the terrorist use of ballistic rockets in attacks against Israel. So far this year the pace of foreign ballistic missile testing is about twice that of last year. This reflects a determination to acquire these valuable weapons, a value that's generated by historic lack of deployed forces against them.

Therefore, it is critical that we continue to develop, produce, and deploy missile defenses to devalue these weapons. Last summer when the North Koreans launched several missiles capable of striking our allies and deployed forces in the Pacific and an intercontinental ballistic missile (ICBM) believed to be capable of striking the United States, we were able to provide the President an option. An option to activate an integrated missile defense system, a system that I am confident would have worked. This confidence is borne in our test program, which accounts for almost $2 billion per year, now.

We have taken on the challenge of realistically testing a complex system that covers 10 time zones and that intercepts warheads in the atmosphere, and in space. The Director of Operational Test and Evaluation (DOT&E) and I have approved an Integrated Master Test Plan, which includes criteria for operational realism.

In particular, this past September we conducted a long-range interceptor flight test that involved the use of operational crews, operational fire control, and fielded software. We used operational sensors and an operational interceptor launched from an operational missile field.

Over the past year the Missile Defense Agency (MDA) has conducted more than 35 major tests and successfully met our primary test objectives in 15 of 16 flight tests. Overall since 2001 we have built a record of 26 successful hit-to-kill engagements in 34 attempts. Our test schedule remains very aggressive and for the remainder of this year we plan to conduct two long-range intercept flight tests, four Aegis flight tests, three more THAAD flight tests, one Israeli Arrow test, and dozens of ground tests.

We've also been successful in the unprecedented fielding and deployment of capability to the warfighter thanks to an underlying acquisition approach that gives us the flexibility to manage risk,

while continuing to upgrade the system. As a result, in just over 30 months, since June 2004, we have in place 17 long-range interceptors in Alaska and California. We've modified 16 Aegis ships for missile tracking with 7 able to launch the 20 sea-based interceptors that we've fielded. We've upgraded three land-based early warning radars, delivered two transportable radars, and one massive Sea-Based X-Band (SBX) radar, and fielded command and control capabilities in Hawaii, Alaska, Colorado, Nebraska, Washington, DC, and the United Kingdom.

Using our approach, we have achieved in 2½ years what would have taken two or three times longer with a standard process.

Our acquisition flexibility has allowed us to implement numerous cost-saving measures. We have reduced unneeded overhead by approximately $1.8 billion from fiscal years 2006 to 2011. More specifically, we saved enough money in the GMD program alone, to purchase four more GBIs.

The inclusion of U.S. Strategic Command (USSTRATCOM) and other combatant commands in our development, test, training, and fielding activities has been another key to this success. We've worked with them and the Services from defining and prioritizing new requirements, to transition and transfer plans for operations and support.

Based on this solid foundation, we are now requesting $8.9 billion for fiscal year 2008 with more than 75 percent of these funds, or $7.1 billion, going to near-term capabilities and the remainder, or $1.8 billion allocated to develop defenses against the threats that may loom tomorrow. This budget reflects a three-part strategy.

First, we seek $5.9 billion to maintain and sustain an additional capability that includes the fielding of up to 44 long-range interceptors in Alaska and California, deployment of up to 132 sea-based interceptors on 18 ships, and deployment of 2 mobile THAAD fire units with 48 interceptors and, expanding our critical command, control, battle management, and communications (C2BMC) element. Sustaining this overall capability is approaching $1 billion per year.

Second, we seek $1.6 billion to close gaps and improve our capability to keep pace with the growing threats. This objective includes the fielding of 10 long-range interceptors and a mid-course radar in Europe to defend our deployed forces and our allies in that theater, as well as providing additional protection to the United States. We have entered into discussions with Poland and the Czech Republic to host these assets and we've been engaged with our North Atlantic Treaty Organization (NATO) partners and the Russians.

Finally, we request $1.4 billion for the third component of our strategy, to develop options for future threats. Options which include boost phase defenses and the ability to provide persistent, space-based, global detection and tracking.

Missile defense is global in nature, and we have an increasing number of allies and friends joining us in our efforts. Japan remains one of our closest partners in missile defense. Together, we have successfully flight-tested new nose-cone technologies, and

agreed to co-develop a larger version of the Standard Missile-3 (SM–3).

We are working closely with the United Kingdom and Denmark to upgrade existing early-warning radars. We have also signed cooperative agreements with Australia and Italy, and continue to work with Israel on both medium- and short-range missile defenses. We have begun collaborating our missile defense with many, many other nations.

In closing, I want to emphasize that the threat we are facing from ballistic missiles is real and growing. We have overcome setbacks and technical hurdles, but thanks to the support from Congress, we are succeeding at our mission, and we have absolutely no reason to slow down. As we look to the gathering clouds of threat on the horizon, now is not the time to cut back on support for missile defense, but we think, to advance it.

Thank you for the opportunity to appear before you today, and I look forward to your questions.

[The prepared statement of General Obering follows:]

PREPARED STATEMENT BY LT. GEN. HENRY A. OBERING III, USAF

Good afternoon, Mr. Chairman and distinguished members of the subcommittee. It is an honor to present the Department of Defense's fiscal year 2008 missile defense program and budget.

I am pleased to report that 2006 was a year of significant accomplishment for all aspects of our missile defense program. We made substantial progress in developing, testing and fielding an integrated, layered Ballistic Missile Defense System (BMDS) to defend the United States, our deployed forces, and our allies and friends against ballistic missiles of all ranges in all phases of their flight.

Of the $8.9 billion we are requesting in fiscal year 2008, we will allocate $7.1 billion for near-term efforts and $1.8 billion for longer-term programs. In the near-term, we seek to build on, and sustain, our current capability to defend the homeland against limited long-range ballistic missile threats and protect allies, friends and deployed forces against short- to medium-range threats. To achieve this goal, we intend to complete the fielding of up to 44 Ground-based Interceptors (GBIs) in Alaska and California; enhance our early warning radars in Alaska, California and the United Kingdom; integrate the Sea-based X-band (SBX) radar into the BMD system; deploy up to 132 sea-based Standard Missile-3 (SM–3) interceptors on 18 Aegis engagement ships; and expand our command, control and battle-management network by establishing three new command and control suites at U.S. Strategic Command, U.S. Pacific Command, and U.S. Northern Command.

In the near-term we also seek to close gaps and improve our capability to defend against a growing Iranian threat. We will continue the initiative we began this year to field 10 long-range interceptors and a midcourse radar in Europe. This initiative is essential for a robust, layered defense of the homeland against long-range threats from the Middle East. It will also extend this defense to our deployed forces, allies and friends in the region who currently have no defense against longer-range ballistic missiles. To improve our capabilities to defeat more complex threat suites, our Multiple Kill Vehicle (MKV) program will allow us to engage multiple warheads and countermeasures with a single interceptor launch. Delivering this volume kill capability is important to the warfighter and is one of our top priorities.

For the longer-term, we are developing the Space Tracking and Surveillance System to provide a persistent, near-real-time global detection, tracking and fire control capability. This system will significantly increase the BMD system's agility and flexibility to respond to future worldwide emerging threats. We also continue to pursue boost-phase intercept capabilities in order to increase the "depth" of our integrated, layered system. Boost-phase defenses promise to increase our intercept opportunities and destroy enemy ballistic missiles when they are most vulnerable. The Airborne Laser (ABL) remains our primary boost-phase program. Based on the Defense Science Board's recommendation, we're continuing the high-acceleration Kinetic Energy Interceptor (KEI) booster development effort as an option in the event ABL does not meet critical knowledge points in its test program. The U.S.-Japanese cooperative development of a follow-on SM–3 interceptor to give the Aegis system an intercontinental ballistic missile (ICBM) intercept capability, a robust Sea-Based

Terminal capability to defeat shorter-range threats, a modest experimental Space Test Bed, and our continuing advanced technology efforts all support the goal of closing capability gaps in the system.

THE EVOLVING SECURITY ENVIRONMENT

This past 4th of July, millions of Americans were made aware of just how real the threat from ballistic missiles is and how vital the missile defense program is to our national security. With the launches of the short-, medium- and long-range missiles by North Korea, missile defense became an urgent matter overnight. Because of the efforts of thousands of Americans dedicated to this program, we were able to activate a missile defense system to protect the United States had a threat emerged.

In November 2006 and January 2007 Tehran conducted several short- and medium-range ballistic missile and rocket launches. In the November exercises Iran demonstrated for the world its offensive capabilities via televised broadcasts.

North Korea and Iran dedicate significant resources to acquiring ballistic missiles, to include new medium- and intermediate-range systems capable of reaching forward-deployed United States forces and our allies and friends. North Korea continues to work on intercontinental-range systems capable of reaching the United States. In addition, our intelligence community assesses that Iran would be able to develop an ICBM before 2015 if it chose to do so. With the missile firings over the past year, they have also demonstrated the ability to conduct coordinated launch operations. But they are not alone.

In 2006 there were about 100 foreign ballistic missile launches around the world. This year to date, the pace of testing is about twice that of last year—a trend reflecting the determination of many countries to acquire these capabilities.

The actions of North Korea and Iran this past year demonstrate the determination of these rogue regimes to achieve this capability and potentially weapons of mass destruction to further aggressive ends. With the proliferation of ballistic missile technology, we expect to be surprised by unexpected and more robust threats. The missile defense development program recognizes that we must stay a step ahead of a dynamic threat.

U.S. BALLISTIC MISSILE DEFENSES—A REPORT CARD

In January 2002, just a little more than 5 short years ago, the Secretary of Defense directed the agency to restructure the missile defense program to deal with the urgency, enormity, and complexity of developing, testing, and building a missile defense system. This bold initiative required the adoption of an evolutionary acquisition strategy to be executed by a single agency, a strategy that relies on continual assessments of the threat, available technology, and what can be built and fielded to provide a militarily useful capability in an urgent manner.

Having capitalized on our steady progress since the 1980s, the dedicated men and women of the Missile Defense Agency (MDA) and our industrial partners delivered to the combatant commanders in 2004 an initial missile defense capability to defeat the near-term long-range missile threat. Supported by an extensive command, control, battle management, and communications (C2BMC) infrastructure, we connected additional system elements to the fire control system and put in place trained system operators, the logistics support infrastructure and support centers required for this limited operational system.

To date, we have made significant, and in many ways, unprecedented strides to deliver a capability where none existed before. Since 2002 we have fielded and completed the initial integration of land- and sea-based interceptors, mobile and fixed sensors and C2BMC suites to deliver one of the most complex and comprehensive defensive capabilities ever envisioned. We did so while sustaining an aggressive development program that continues to feed new technologies into the system.

Mr. Chairman, the missile defense investments of 4 administrations and 11 Congresses are paying off. With the initial deployment of a limited missile defense capability, the era of absolute vulnerability of our country to a long-range missile attack came to a close. This is important, because I believe a capability against even a single reentry vehicle has significant military utility. The modest long-, medium-, and short-range defensive capabilities we have today can help reduce the more immediate threats to our security and enhance our ability to defend our interests abroad.

Long-Range Defenses

As part of our strategy to protect the United States from ballistic missiles launched from North Korea or Iran, we have emplaced high-performance interceptors in missile fields at two sites and integrated them into the system. The system's

GBIs use hit-to-kill technologies to destroy intermediate- and long-range ballistic missile warheads in space, in the midcourse phase of flight. These are the only weapons we have available today to defeat longer-range threats once they have been launched. By the end of April, we expect to have 16 GBIs in silos at Fort Greely, Alaska, and 2 more at Vandenberg Air Force Base in California. We plan to increase interceptor inventories at these sites to up to 24 by the end of this year.

The system today will receive a cue from Defense Support Program satellites or from 1 of 16 long-range surveillance and track Aegis destroyers that could be stationed near the threat region. These satellites and ships can pass detection or cueing data across communications lines into BMD system communication and battle manager nodes located in Fort Greely and Colorado Springs. Today we stand ready to locate and track threats coming out of East Asia using the Cobra Dane radar in the Aleutians and the upgraded early warning radar at Beale Air Force Base, California.

Powerful X-band radars located on a mobile platform in the Pacific Ocean and at Shariki, Japan can provide precise tracking and discrimination to increase the probability we will destroy any lethal target. A 2006 independent assessment concluded that the SBX radar, which deployed to the Pacific at the end of 2005, is sufficiently rugged to operate in the rough seas of the northern Pacific. These conditions were validated this past winter when the SBX experienced extremely hazardous weather with negligible impact. Also in 2006, we deployed the first forward-based X band radar to Japan, accelerating its deployment and supporting C2BMC equipment to its operational location in Shariki Japan, achieving partial mission capability in October 2006.

Short- to Medium-Range Defenses

Since 2004 we have expanded and improved terminal and midcourse defenses to defeat short- and medium-range threats from land and sea. Aegis ships have been periodically put on station in the Sea of Japan to provide long-range surveillance and tracking data to our battle management system. We began fielding SM–3 interceptors in 2004, evolving to a more capable interceptor. With our growing inventory of SM–3 interceptors on Aegis ships, we can provide a flexible sea-mobile capability to defeat short- to intermediate-range ballistic missiles in their midcourse phase. In 2005 we upgraded the first Aegis cruisers for the engagement mission. Today we have available three Aegis BMD engagement cruisers and four engagement destroyers.

Having successfully transitioned the Patriot Advanced Capability-3 (PAC–3) to the U.S. Army in March 2003, we continue to maintain configuration control and work with that Service to improve and upgrade PAC–3 and Medium Extended Air Defense System performance. Today, PAC–3 fire units are being integrated into the forces of our allies and friends, many of whom face immediate short- and medium-range threats.

Integrating the System

For the BMDS to work effectively, all of its separate elements must be integrated across several combatant commands. This capability allows us to mix and match sensors, weapons, and command centers to dramatically expand detection and engagement capabilities over what can be achieved by the system's elements operating individually. Combatant commanders can use the C2BMC infrastructure to enhance planning, synchronize globally dispersed missile defense assets, and manage weapon inventories. These capabilities also can provide our senior government leadership situational awareness of ballistic missile launches and defense activities. Today we have in-place a planning capability within U.S. Strategic, Northern, and Pacific Commands.

Supporting the Warfighter

This past year we continued work with U.S. Strategic Command and other combatant commands to train missile defense crews at all echelons, ensuring that they can operate the BMDS if called upon to do so. We established a BMD Operations Watch Officer to provide real-time BMD situational awareness, operational status, and coordinate the configuration of the system and have executed a series of exercises, which involve temporarily putting the system in a launch-ready state.

We have set up a process to collaborate with the combatant commanders and the military Services to define and prioritize requirements as the system evolves. For example, we did not have a sea-based terminal layer planned for the program until the Commander of U.S. Strategic Command identified this as a desired capability. Once this need was identified, we worked with the Navy to define and budget for near- and far-term programs for a Sea-Based Terminal defense. We also have worked closely with the Services and the Office of Secretary of Defense on transition

and transfer activities to address operations and support of the system elements. The Deputy Secretary of Defense identified lead military departments for eight elements of the BMDS, and the Navy has just agreed to take on lead service responsibility for the SBX Radar. We have developed Transition and Transfer Plans with the Services and the combatant commands. These plans capture both agreements and the roles and responsibilities associated with evolving operations and support activities. This collaboration with the warfighter includes training, testing, wargaming, and conducting exercises and simulations, all of which help demonstrate and improve the capability and reliability of the missile defense system.

BMD System On Alert

As I stated earlier, when the North Koreans conducted their launches last summer, for the first time in the history of the United States, we had the capability to defend our people against a long-range missile had it been necessary. Working closely with U.S. Strategic Command's Joint Functional Component Commander for Integrated Missile Defense, we successfully took the system out of the development mode and handed it over to the warfighter for operation. This activation of the system last June helped us to refine procedures and taught us invaluable lessons about system operations.

Alert activities included activation of the Ground-based Midcourse Defense and the deployment of a missile defense capability to the Sea of Japan. We had Aegis long-range surveillance and track ships stationed east and west of Japan during the missile firings. Data collected from these sensors would have helped identify whether the long-range launch was a ballistic missile or a space launch vehicle and would have provided tracking data to the system. The C2BMC situational awareness displays were operational and being monitored at the various commands.

We also accelerated the capability of the forward-based X-band radar in Japan for data collection. The SBX radar was stationed off Hawaii and similarly standing by for data collection. At the time, the forward-based radar and the sea-based radar were not integrated into the system. Given these events from last summer and our ability to bring the system on line and prepare it for emergency use, I am very confident that the system would have operated as designed had the Taepo Dong-2 threatened the United States.

We have an operational system today because of the capability-based acquisition approach we have followed since 2002. This approach leverages collaboration with the warfighter community throughout development and testing to the point where we transition or transfer capabilities to the operators. Some have asserted that our nontraditional approach lacks discipline, transparency, and/or accountability. I do not agree. I think the progress we have made to date in fielding a missile defense capability speaks for itself and justifies the continuation of this approach. Had we followed the traditional acquisition approach, we would not have had an operational capability to respond to the potential threat from North Korea. Had we followed the traditional approach, I believe we truly would have "delivered less at a higher cost."

The missile defense program is highly scrutinized by the Department of Defense, the Congressional Budget Office, the Government Accountability Office, and Congress. In 2004, Congress required the MDA to submit a cost, schedule and performance baseline for each block configuration of the BMDS being fielded. We have complied with this law every year, describing our baseline in terms of 2-year increments of capability called fielding blocks. From an acquisition process perspective, I understand that we are blazing new trails, and the information we provide is therefore different from what people are used to seeing. I understand the onus is on us to clearly convey to Congress that we are fielding ballistic missile defense capability in a responsible and transparent manner, and I am committed to doing that. I have therefore directed my staff to complete a review of our current approach and look at ways to better describe our baseline program.

BUILDING CONFIDENCE THROUGH SPIRAL TESTING

Testing under operationally realistic conditions is an important part of maturing the system. We have been fielding test assets in operational configurations in order to conduct increasingly complex and end-to-end tests of the system. While the BMD system is a developmental system, it is available today to our leadership for activation to meet real world threats. Given this dual function of the test bed, the Operational Test Agencies and the warfighting community are very active in all phases of our test planning, execution, and post-test analysis.

Using criteria established by the Agency's system engineers and our warfighters, all system ground and flight tests provide data that we and the operational test community use to verify the system's functionality and operational effectiveness. Our flight tests are increasing in operational realism, limited only by environmental

and safety concerns. Each system test builds on the knowledge gained from previous tests and adds increasingly challenging objectives, with the downstream goal of devising scenarios that test elements of the system from end-to-end. This spiral test approach increases knowledge of, and confidence in, the system performance while maintaining safety and minimizing artificiality.

Last year I explained that we had several concerns with quality control and reliability that led to two successive Ground-based Midcourse Defense test aborts, problems that we have since comprehensively addressed. The independent review team concluded that the deficiencies in systems engineering, ground qualification testing, flight test readiness certification, contractor process control and program scheduling were not systemic and did not compromise initial defensive capabilities. I testified last year that I did not view the failures as major technical setbacks.

Coming off the very successful fly-out of the operational configuration long-range interceptor in December 2005, we conducted a long-range intercept flight test last September that exceeded our objectives. That complex test involved an operational interceptor launched from an operational silo at Vandenberg Air Force Base, operational sensors, and operationally trained crews manning operational fire control consoles. The test demonstrated the functionality of the Exo-atmospheric Kill Vehicle and the ability to engage a threat-representative target using the Upgraded Early Warning Radar at Beale Air Force Base in California. After the kill vehicle acquired the target launched out of the Kodiak Launch Complex in Alaska nearly 3,000 km away from the engagement zone, it successfully intercepted it. While it was not hooked into the system, we also demonstrated the powerful contributions the SBX radar can make in the areas of tracking and discrimination. This was our most operationally realistic, end-to-end test of the system involving the Ground-based Midcourse Defense element to date.

Over this past year the MDA conducted more than 35 major tests and successfully met our primary test objectives in 14 out of 15 flight tests. In fact, during a 90-day period last summer, we achieved successful hit-to-kill intercepts in the lower atmosphere with the PAC–3, in the upper reaches of the atmosphere with the Terminal High Altitude Area Defense element, and in space with the Aegis SM–3 and the Ground-Based Midcourse Defense elements. Including tests of the PAC–3, we achieved seven hit-to-kill intercepts of ballistic missile targets in eight attempts in 2006. Since 2001, we have built a record of 26 successful hit-to-kill engagements in 34 attempts. Our test plans for 2007 and 2008 will continue to use more complex and realistic scenarios for system-level flight tests.

We plan three more long-range interceptor flight tests by the end of this year that continue to push the edge of the envelope in testing complexity. All tests will continue to use operationally trained crews and the operational launch site at Vandenberg. We plan to integrate the SBX radar into the system for the intercept test in late summer as we continue to expand the number of sensors available to us to cue the system and engage targets.

On June 22 of last year, we successfully used a U.S. Navy Aegis cruiser to engage a separating target carried on a threat-representative medium-range ballistic missile. As we had done in the past three flight tests, we did not notify the operational ship's crew of the target launch time, and they were forced to react to a dynamic situation. The role of the crew is an important part of our ability to engage hostile missiles, and last December we increased test complexity by attempting a simultaneous engagement of aerial and ballistic targets and by using operator-selectable parameters to allow for automatic identification of targets. A crew member changed the ship's doctrine parameters just prior to target launch. This modification prevented the ship's fire control system from conducting the planned ballistic missile and aerial target engagements. The primary target was a very short-range ballistic missile, and thus there was insufficient time for manual engagement. When the SM–3 interceptor failed to launch, we aborted the launch of the SM–2 interceptor. This is another example of why we conduct tests—to expose flaws in the system and wring out operational procedures. We are working to resolve the problem we experienced in the test last December and expect to conduct it again this spring.

We plan four more Aegis intercept flight tests in 2007. We will again demonstrate the integration of the Aegis BMD weapon system into the overall BMD system and evaluate the ship crew's performance in executing an operationally realistic BMD mission. Early this summer, we will attempt an intercept of a separating, medium-range target using the SM–3 Block IA interceptor. Later this year, we will demonstrate the ability to engage two near-simultaneous short-range unitary targets. Also late in 2007, as part of our growing partnership with Japan, a Japanese Maritime Self Defense Force Kongo-class ship will attempt to engage a medium-range ballistic missile separating target using the Block IA SM–3 interceptor. This will be the first such firing by a maritime ally. In 2008 we will engage a separating inter-

mediate-range ballistic missile target using off-board sensor information to launch the interceptor. We will also attempt a second sea-based intercept test with our Japanese partners.

As I mentioned earlier, flight-testing involving the redesigned Terminal High Altitude Area Defense (THAAD) interceptor continued last July with a successful engagement of a unitary target high in the atmosphere. In September we again sought to demonstrate the performance of the new missile and the ability to integrate it into the BMD system, but we were unable to do so following the failure of the target missile. This past January and earlier this month, we again successfully destroyed short-range targets. These endo-atmospheric engagements were the first such tests of the THAAD interceptor at the Pacific Missile Range Facility. To demonstrate the capability of the THAAD fire unit to intercept at different altitudes in the atmosphere and in low exo-atmosphere, we plan one more intercept test in space later this year against a unitary target. In 2008 we plan to demonstrate interceptor capabilities against more stressing targets. We will conduct two intercept tests involving the THAAD interceptor, one against a separating target in space, and the other against a separating target high in the atmosphere. Further, the first test in 2008 will include the launch of two THAAD interceptors. The MDA will also participate in Patriot combined developmental/operational tests as well as Air Force Glory Trip flight tests.

In 2007 we will continue with our successful ground testing, which involves warfighter personnel and test hardware and software in the integrated system configuration to demonstrate system connectivity and interoperability. Upcoming tests will verify integration of the sea-based, forward-based, and Fylingdales radars. The funds we are requesting will support additional capability demonstrations and readiness demonstrations led by the warfighting community. We currently cannot test and train on the system while it is in full operational mode. To address this problem, we are developing a capability to support continued research, development, test, evaluation, and maintenance while concurrently sustaining operational readiness.

Based on the many tests we have conducted to date, we maintain our confidence in the BMD system's basic design, its hit-to-kill effectiveness, and its inherent operational capability. We continue to work closely with the Director, Operational Test & Evaluation, Operational Test Agencies, and combatant commanders to characterize the effectiveness and readiness of the system at every stage in its development and fielding. We are developing the capability to conduct concurrent test, training, and operations, which will allow combatant commanders to keep the system in operational mode while we test, train, and make improvements to the system.

BMD SYSTEM FIELDING PLANS

Maintaining and Sustaining the Capability

The top priority of the MDA is to maintain and sustain the deployed initial capability to stay ahead of the North Korean and Iranian threats. This means improving long-range capabilities for homeland defense and moving forward with initial defenses to protect allies and U.S. interests abroad against shorter-range ballistic missiles.

Our program strategy completes the fielding of GBIs in Alaska and California. We will begin construction in 2007 of a third missile field at Fort Greely and accelerate delivery of interceptors. We also will begin increasing the number of interceptors available at Vandenberg Air Force Base from two to four. An additional fifth silo at Vandenberg will be dedicated to testing. We will have up to 30 long-range interceptors deployed by the end of 2008. For midcourse capability against the long-range threat, the Ground-based Midcourse Defense element budget request for fiscal year 2008 of about $2.5 billion will cover continued development, ground- and flight-testing, fielding and support.

To address short- to intermediate-range threats, in 2006 we added one Aegis engagement cruiser, for a total of three, and three Aegis engagement destroyers. As we convert destroyers this year to add the engagement capability, the number of long-range surveillance and track ships will fall from 10 at the end of 2006 to 7 and our total number of fully BMD-capable Aegis engagement ships (cruisers and destroyers) will climb to 10. By the end of 2008, we plan to have 13 Aegis engagement destroyers and 3 engagement cruisers and 40 interceptors in inventory. System tests will involve further demonstrations of the sea-based interceptor, and we will continue enhancing the system's discrimination capability. For fiscal year 2008, we are requesting approximately $1.044 billion to continue Aegis BMD development and testing.

To supplement the Cobra Dane and Beale radars, we will finish the integration work on the Royal Air Force Fylingdales early warning radar in the United Kingdom. It will be fully operational by the end of this year. This radar will provide coverage against Middle East launches against the United States and our allies in Europe. Our fiscal year 2008 budget request for BMD radars is $758 million. These funds will continue forward-based radar integration work and complete construction of a permanent basing site at Shariki Air Base. We will also have available for deployment a second forward-based X-band radar.

With this year's budget request of $247 million for the C2BMC activity, we will continue to use spiral development to incrementally develop, test, and field hardware and software improvements leading to a robust, net-centric missile defense capability that fights as a system. We have made incredible progress in this area despite decrements in funding over the past couple of years. Our ability to defend against highly lethal threats or operate in a very complex, stressing battle environment spanning multiple theaters requires all missile defense elements, which may be spread over thousands of miles, to work together as a "team." Today we can do that. I am very proud of what our national team for integration has achieved. We will press on with the development of the Global Engagement Manager at the Pacific Air Operations Center and integrate into the system the forward-based radar in Japan, the SBX radar, and the Fylingdales radar. We plan to install additional planning and situational awareness capabilities to facilitate executive decision-making in the European Command and the Central Command by 2009.

Closing Capability Gaps

Our long-term strategy is to make the system more robust, reliable, and flexible in order to close gaps in our missile defense capabilities. In line with our multilayer approach, the missile defense program in fiscal year 2008 and beyond will expand terminal defense protection, upgrade and improve midcourse discrimination and firepower, strengthen the capability of the BMDS to defeat coordinated attacks, and place increasing emphasis on boost phase defenses.

The missile defense program will improve coverage of the United States and, for the first time, extend coverage to Europe against longer-range ballistic missiles. We have agreed with Poland and the Czech Republic to begin focused discussions on the deployment of long-range interceptors and a midcourse discrimination radar. If negotiations are successful, we plan to modify the X-band radar currently located on the Kwajalein Atoll and relocate it to a site in the Czech Republic. The deployment of this X-band radar in Europe will complement sensor assets deployed in the United Kingdom and Greenland. In addition to increasing the number of long-range interceptors emplaced at missile fields in Alaska and California, we are hopeful that successful completion of negotiations with the Government of Poland will allow us to start emplacing 10 GBIs in Poland beginning in 2011.

We also are developing the MKV system to upgrade long-range interceptor performance by attaining a volume kill capability to defeat multiple reentry vehicles and midcourse countermeasures. We have restructured the MKV program to develop land- and sea-based interceptor payloads by the middle of next decade. Besides bringing several kill vehicles to the fight, the MKV system will provide critical tracking and discrimination information to other system sensors and interceptors and assist with kill assessment. We have requested $265 million for this work in fiscal year 2008.

This budget submission also continues the upgrade of the Thule early warning radar in Greenland and its integration into the system by 2009. Together with the radars in California, Alaska, and the United Kingdom, the Thule radar will ensure full coverage of the United States against threats from the Middle East. We will also continue to enhance additional forward-based X-band radar capabilities in Japan and other operating locations to meet warfighter needs.

We also will bolster defenses against short- to medium-range threats by increasing the inventory of Aegis BMD sea-based interceptors from 86 to 132 by 2013. Upgrades to the SM–3 include improvement of the Divert and Attitude Control System and discrimination performance. We also will provide a full upgrade of the Aegis BMD Weapon System to improve its ability to detect, acquire, and intercept more diverse, longer-range threats. At the end of the decade we will integrate Aegis BMD with the Navy-developed Open Architecture system to remain compatible with Navy ships following modernization.

We will field 2, and future plans call for 4, THAAD fire units, which consist of radars and 96 interceptors. THAAD will provide transportable terminal protection for our troops and areas along the U.S. coasts or on the territories of our allies. The first unit will be fielded in 2009, with subsequent units fielded by 2012. We are requesting $858 million in fiscal year 2008 for THAAD development and fielding.

DEVELOPING OPTIONS FOR THE FUTURE

We do, of course, need to address far-term threats. In simplest terms, that means managing a program that balances initial, near-term fielding of system elements with long-term development. I continue to be a firm believer in the balanced program, because it neither compromises our security in the present nor short-changes our future safety. This approach recognizes the urgency of fielding capabilities to address threats we face today and the necessity of continuing support for vigorous development activities to prepare for tomorrow's ballistic missile challenges to our security.

I am in strong agreement with the members of the House Armed Services Committee, who recently concluded that the country's missile defense program "must be scalable in response to the evolution of the threat."[1] The MDA plans to develop options for incrementally fielding elements of the BMDS. We will do this by leveraging a key U.S. strength, our technological advantage, and by building with our allies a foundation of global access and response.

In executing our program we continue to follow a strategy of retaining alternative development paths until capability is proven—a knowledge-based funding approach. That means we are setting specific targets, or knowledge points, that the development efforts have to reach to demonstrate a specific capability.

There are several important development efforts funded in this budget. A significant part of missile defense investment has been devoted to the development of terrestrial boost phase defenses to supplement currently fielded midcourse and terminal defenses. An operational ABL could provide a valuable boost phase defense capability against missiles of all ranges. We restructured the KEI activity to focus on development of a high-acceleration booster, one that is more capable than any booster we currently have in inventory. Either ABL or the kinetic energy booster will be selected as the primary boost phase program upon completion of critical knowledge points before 2010.

Over the past 2 years we have demonstrated in ground tests the power and reliability of the ABL high energy lasers. We also have tested the command and control and passive target detection systems in flight. In 2006 we refurbished the high energy laser optics and completed integration and ground testing of the low-power tracking and beacon illuminator lasers. This year we will flight test the beam control and atmospheric compensation against a cooperative airborne target. Earlier this month, we reached an important milestone in this program when we conducted the first in-flight test of the laser targeting system, successfully demonstrating a technology that will help track a boosting ballistic missile and identify the most vulnerable sections on the rocket motor case to be hit by the high energy laser. We recently completed major structural modifications to the Boeing 747 aircraft to support installation of the high energy laser, which will continue in 2008. The $516 million we request in fiscal year 2008 will complete integration of the high energy laser modules with the modified aircraft as we prepare for a lethal shootdown of a ballistic missile target in 2009. Despite the continued technical challenges we face, I remain optimistic that we can produce an operationally effective directed energy capability.

We have made good progress in our high-acceleration booster development effort. This past year we successfully conducted the first static firings of the first and second stage boosters and demonstrated overhead non-imaging data fusion processing within the prototype fire control component. This high acceleration booster also would enhance the performance of the currently deployed GBI. Within the restructured program we will maintain options to develop a land-mobile launcher and fire control system as well as an option for a sea-based capability. We are requesting $214 million in fiscal year 2008 for this activity.

We plan to develop space-based sensors to provide a persistent identification and global tracking capability. A small constellation of Space Tracking and Surveillance System (STSS) satellites will enable operation of the missile defense system worldwide, independent of terrestrial-based sensors along the threat trajectory. These sensors will be able to detect and track enemy ballistic missiles and payloads through all phases of flight and close the system fire control loop globally. We are on track to launch two demonstration satellites in November 2007. Next year, following on-orbit check-out, these demonstration satellites will perform live target acquisition, tracking and handover. We are requesting approximately $319 million in fiscal year 2008 to execute the STSS activity.

[1] House Armed Services Committee, Committee Defense Review Report, December 2006, p. 104.

We have learned a great deal from the ground-testing of the STSS Block 2006 sensors in representative, thermal vacuum conditions. We have proven that this class of sensor will achieve the necessary sensitivity to support intercepts. Given the long design timelines for space systems, we are requesting funding in fiscal year 2008 to begin work on the follow-on constellation. Postponing the start of this phase of the program will delay our ability to achieve a necessary global sensor and fire control capability.

Later this month we are launching a satellite, the Near Field Infrared Experiment (NFIRE), to collect high resolution infrared phenomenology data from boosting targets. Following preparation of the satellite once it is on-orbit, in August and October 2007, we will conduct tests using live ballistic missile targets. The data from NFIRE will be fed into simulation models and contribute to the future sensor designs.

We will continue work with Japan to increase SM–3 range and lethality. The development of the 21-inch M–3 Block IIA interceptor will increase our capability to engage longer-range ballistic missiles from Aegis BMD platforms and help close a capability gap around 2015. We have requested $74 million in fiscal year 2008 as part of our cooperative work with Japan to purchase long-lead items required for the development of this interceptor.

Another capability gap exists in terminal defense against short- and medium-range ballistic missiles. For the past 2 years, the Navy and the MDA have collaborated on plans for a Sea-Based Terminal defensive layer. In May 2006 we demonstrated the feasibility of developing a limited near-term capability against a short-range ballistic missile using a modified SM–2 Block IV interceptor. Based on this demonstration, we are upgrading the Aegis weapon system, and the Navy is upgrading the SM–2 Block IV missile, the goal being to install a terminal engagement capability on 18 Aegis BMD ships beginning in 2009. We also are examining with the Navy options for developing a far-term improved capability to address short- and medium-range threats. Our fiscal year 2008 request for Sea-Based Terminal development work is $75 million.

The next generation of C2BMC capability will be essential if we are to close gaps in our command seams. As we deliver more sensor and interceptor capability into the hands of the warfighters, they are faced with several more options to defend their areas of responsibility. We must continually refine our C2BMC capability to allow the warfighters to rapidly process all of the available options, plan for the employment of BMDS assets, and globally manage the execution of the system on tight timelines. The battlefield effect is that the integrated BMD system can defend against more missiles simultaneously, reduce risk of missiles leaking through our defenses, conserve more interceptor inventory, and defend a larger area.

Finally, I am deeply concerned about future threat uncertainty and worldwide ballistic missile proliferation. I believe the performance of the BMD system could be greatly enhanced by an integrated, space-based layer. Space systems could provide on-demand, near global access to ballistic missile threats, minimizing the limitations imposed by geography, absence of strategic warning, and the politics of international basing rights. A space layer would apply pressure on launches from land or sea, depriving the adversary of free rides into midcourse with advanced countermeasures. While deployment of such a system must be preceded by significant, national-level debate, that debate must be informed by science. To that end, we are ready to begin a focused investigation of the feasibility of having an integrated space-based layer, and I am requesting $10 million for fiscal year 2008 to begin concept analysis and preparation for small-scale experiments. These experiments will provide real data to answer a number of technical questions and help the leadership make a more informed decision about adding this capability.

We have had to restructure some development activities and cancel others as a result of congressional and departmental reductions in the MDA budget. The following program activities have been delayed: delivery of the first operational STSS satellite has slipped from 2012 to the 2016–2017 timeframe, prolonging the time we will be without a capability to integrate the system globally; and the scope of the KEI activity has been reduced to focus on booster development and delay work on system integration, battle management, and fire control. The reductions also have impacted work in the area of innovative technology development. I regret that we have had to cancel the advanced technology development work associated with our micro-satellite activities and eliminate funding for the High Altitude Airship beyond fiscal year 2007.

INTERNATIONAL PARTICIPATION

The global nature of the threat requires that we work closely with our allies and friends to develop, field, and operate missile defenses. I am pleased to report that many governments share our vision for missile defense. This past year we continued to build on a very successful program to involve more countries and forge international partnerships. Without the participation of our allies and friends, the BMDS would look very different.

The Government of Japan remains solidly behind missile defense and has even accelerated its program to field multilayered missile defenses that are interoperable with the U.S. system. Japan continues to upgrade its Aegis destroyers and acquire SM–3 interceptors. In March 2006 we successfully flight-tested new nosecone technologies developed in cooperation with Japan. Additionally, the MDA and Japan have agreed to co-develop a Block IIA version of the SM–3, which will improve our defensive capabilities against longer-range missiles. Japan also is upgrading its Patriot fire units with PAC–3 missiles and improved ground support equipment. In 2008 Japan is expected to begin co-production of the PAC–3 missile.

The upgraded Royal Air Force Fylingdales radar in the United Kingdom will undergo operational testing this year. Once we certify the radar, it will provide the system critical early warning, tracking and cuing data needed to defeat threat missiles coming out of Iran. We are working closely with Denmark to upgrade the Thule early warning radar in Greenland to improve its capability to detect and track ballistic missiles.

Later this year we will conduct satellite-to-ground and satellite-to-satellite communication experiments with a German-built Laser Communications Terminal installed in the NFIRE satellite. Together with an identical terminal on a German satellite, the United States and Germany will perform joint experiments to validate the use of laser technology for high speed space communications.

The United States and The Netherlands have been working together to modify Dutch frigates with a combat system to enable ballistic missile detection and tracking. An upgraded air command and defense frigate from The Netherlands successfully detected and tracked the targets in the December 2006 Aegis ballistic missile defense flight test.

We are continuing work with Israel to implement the Arrow System Improvement Program and enhance its capability to defeat longer-range ballistic missile threats emerging in Iran. We are also conducting a feasibility study on a joint development program called David's Sling for shorter-range missile defense.

We continue to support our North Atlantic Treaty Organization (NATO) partners in advancing the dialogue on the political-military implications of defending European population centers against longer-range missile threats. The MDA is supporting the NATO Active Layered Tactical Ballistic Missile Defense Program Office to develop a capability to protect deployed forces by 2010.

I am also pleased to announce that this past February we put in place a Framework Memorandum of Agreement with Italy and we can now begin to develop opportunities for missile defense technology sharing, analysis, and other forms of collaboration. We have other international interoperability and technical cooperation projects underway, for example with Australia, and are working to establish formal agreements with other governments.

CLOSING

Mr. Chairman, in closing, some have said that the Defense Department's investments in missile defense are misdirected, that other threats are more pressing. Others have said we are spending too much money on missile defense and that it is too expensive. Still others have claimed that we should slow down fielding activities until the technologies are more mature.

I disagree with these critics, Mr. Chairman. We must meet the rising threats posed by ballistic missiles. We have seen rogue nations test these weapons in the past year. Ballistic missile defense is expensive, but the dollar investment in this nation's security pales in comparison to the overwhelming price this nation would pay in lives, social dislocation, and economic devastation from a single missile impacting an American metropolitan area. Indeed, the success we have seen in our comprehensive test program indicates that there is no reason to slow down.

In less than 3 short years, thanks to the dedication of thousands of men and women across this country and a first-class, cutting-edge defense industry, we have deployed missile defenses to protect our homeland, our troops deployed to dangerous regions around the world, and our allies and friends. But we have a long way to go. So now is not the time to cut back missile defense. Now is the time to accelerate it.

Thank you and I look forward to your questions.

Senator BILL NELSON. General Campbell?

STATEMENT OF LTG KEVIN T. CAMPBELL, USA, COMMANDING GENERAL, U.S. ARMY SPACE AND MISSILE DEFENSE COMMAND/U.S. ARMY FORCES STRATEGIC COMMAND AND JOINT FUNCTIONAL COMPONENT COMMAND FOR INTEGRATED MISSILE DEFENSE

General CAMPBELL. Chairman Nelson, Senator Sessions, and members of the subcommittee, thank you for having us here today. We appreciate your support.

I'm going to address four aspects of my role, the role as the Joint Functional Component Command for Integrated Missile Defense under General Cartwright at STRATCOM. The assessment of the capabilities that we have today, the role of the warfighter in the development process, and finally, my role as the Army's senior Space and Missile Defense Commander (SMDC).

In our role as the Joint Component, we plan, integrate and coordinate global ballistic missile defense (BMD) operations. This includes developing plans and concepts, it includes planning exercises and executing exercises that cut across all of the Combatant Commanders—European Command, Northern Command, as well as Pacific Command, and STRATCOM.

Starting in July 2006, when the North Koreans had several missile test flights, we successfully placed this system on alert, and it demonstrated, in my view, our ability to operate the system on a sustained basis, and also to dynamically plan across three separate combatant commanders in their real time. So, it validated that our procedures were very good at that point in time.

I think our success is related to two particular activities, one is the exercise program, and the second is the MDA's test program, which we participate in. In the past 12 months, we've had three major exercises across the three combatant commanders, and we've participated in several of the GMD tests in which soldiers, sailors, marines, and airmen operate their systems. These tests and exercises have enabled us to improve our efficiency, both at staff levels, as well down at the individual soldier level.

My assessment, in terms of the near-term, I think we're very limited. The principal limiting factor is typically missile inventory, although in the lower tiers, we do need more Patriot Systems, and I think we're going to solve this when we bring THAAD, when we bring on additional Aegis BMD capability. I think that the potential expansion into Europe with the GMD system, which we think is essential, will thicken our defense for the homeland, and expand it to our allies and forward-deployed forces.

In our warfighter role, in terms of advocacy, we have a very deliberate and disciplined process within USSTRATCOM, which gathers all of the inputs from the combatant commanders and we present those to General Obering at the MDA. We've been able to work a number of issues, we've seen improvements in fielded systems, and we've made recommendations that they pursue systems, such as the Multiple Kill Vehicle (MKV), which we think is important for future threats.

In my role as the Army SMDC, we ensure that our forces have those capabilities necessary to handle the theater-level missile threats. We're transforming that force, we're taking it from separate systems, integrating those systems into a system of systems so such systems as Patriot, THAAD, the surface-launched medium-range missile, and the elevated sensor are the type systems that we're netting together. I think when we do this, a combatant commander then can take those capabilities and better tailor and scope them to his needs in his particular theater.

So, with your help, we're going to continue forward progress in this endeavor, in fielding an integrated missile defense for our homeland, deployed forces, friends, and allies, and I thank you again for having us, and I look forward to your questions.

[The prepared statement of General Campbell follows:]

PREPARED STATEMENT BY LTG KEVIN T. CAMPBELL, USA

INTRODUCTION

Chairman Nelson, Ranking Member Sessions, and members of the subcommittee, thank you for your ongoing support of our military and for the opportunity to appear before this panel. In my view, this committee is a strong ally of the Army and the missile defense community, particularly in our continuing efforts to field missile defense forces for the Nation and our allies. I consider it a privilege to be counted in the ranks with my fellow witnesses as an advocate for a strong global missile defense capability.

My current responsibility entails two roles. The first is as the Army's senior commander for space and missile defense. The second role is as a soldier on the Joint Missile Defense Team and Commander of the Joint Functional Component Command for Integrated Missile Defense, a part of the U.S. Strategic Command. In this role, I serve as the Joint user representative working closely with the Missile Defense Agency (MDA), other Services, and combatant commanders to ensure that our national goals of developing, testing, and deploying an integrated missile defense system are met in an operationally sound configuration.

Chairman, as proven during last year's July 4th North Korean missile launches, Army Soldiers are trained and ready to operate the Ground-Based Midcourse Defense (GMD) Element of the Ballistic Missile Defense System (BMDS) at Fort Greely, Alaska, and the Joint National Integration Center at Schriever Air Force Base in Colorado. These Soldiers, as part of the Joint team, continue to serve as our Nation's first line of defense against a rogue nation's launch of an intercontinental ballistic missile toward our shores. I am proud to represent them along with the other members of the Army and Joint integrated missile defense community.

UNITED STATES STRATEGIC COMMAND JFCC–IMD

The Joint Functional Component Command for Integrated Missile Defense (JFCC–IMD) was established in January 2005 as one element of the U.S. Strategic Command (USSTRATCOM) and reached full operational capability early in 2006. The JFCC–IMD is manned by Army, Navy, Air Force, Marine Corps, and civilian personnel. This joint-manning arrangement and our strong partnership with our collocated MDA team enable us to execute the integrated missile defense mission by leveraging the existing robust infrastructure.

USSTRATCOM, through the JFCC–IMD, continues to aggressively execute its mission to globally plan, integrate, and coordinate missile defense operations. Through stressing operational scenarios, integrated missile defense has experienced robust growth and maturity and has improved its ability to defend this nation. Although, there is much work yet to be done, JFCC–IMD continues to lead the Department's transformation toward more robust integrated missile defense capabilities. The soldiers, sailors, airmen, marines, and civilians of this joint warfighting organization execute our mission to plan, integrate, and coordinate global missile defense operations and support by operationalizing new capabilities from MDA, developing global missile defense plans in collaboration with the geographical combatant commanders, and conducting cross-geographical combatant commander exercises to eliminate seams and gaps to maintain a strong defense against changing threats. Execution of the essential mission includes providing warning of missile attack to other combatant commanders and providing assessment of missile attack.

In all, JFCC–IMD continues to build operational competence of the integrated missile defense capability and warfighter confidence in executing our mission.

Ballistic Missile Defense System Progress

This past year has been a year of operational achievement for integrated missile defense as we successfully placed the BMDS on alert in response to a credible ballistic missile threat from North Korea. This limited defense capability marked the beginning of global missile defense as warfighters from three combatant commands and allies integrated respective assets and personnel toward a single mission against a common threat. The scale of this integration is unprecedented—non-missile defense assets were integrated with legacy and state-of-the-art technologies to provide a shield to protect our homeland. Additionally, we achieved unparalleled integration of the Department's intelligence capabilities to enable timely and responsive indications and warning to support missile defense readiness. We expect the warfighting capability provided by such integration of assets, platforms, doctrine, and personnel to continue to grow in coming years.

The North Korean incident last summer also underscored the growing maturity of the cross-JFCC integration within USSTRATCOM in executing its global mission. JFCC–IMD collaborated closely with the JFCCs for Intelligence, Surveillance, and Reconnaissance (JFCC–ISR) and Space (JFCC-Space) to integrate the intelligence, surveillance, reconnaissance, and space assets for the missile defense missions. This effort afforded the use of intelligence, surveillance, reconnaissance, and space assets that previously had not been included in the missile defense mission. Similarly, JFCC–IMD collaborated closely with JTF-Global Network Operations to maximize availability of a robust communication network to link the decisionmakers in Washington with commanders across the globe. We have also integrated our planning efforts with the JFCC for Global Strike and Integration (JFCC–GSI) to ensure we integrated both offensive and defensive capabilities into potential courses of action. Our approach today for a missile defense contingency is designed to examine and integrate a broader array of capabilities into our planning and execution. In short, JFCCs are maturing in a deliberate and coordinated pace to extend the New Triad in its global mission.

JFCC–IMD's readiness demonstrated during last summer's incident is a testimony to the robust warfighter exercise and test program. During the past year, we planned and conducted three major combatant command-level exercises involving U.S. Pacific Command, U.S. Northern Command and U.S. Strategic Command. These exercises enabled combatant commanders to exercise concepts of operations and tactics, techniques, and procedures, and improve our planning and execution of missile defense operations. These activities enhance warfighter competence in prosecuting a global missile defense capability. JFCC–IMD's global missile defense exercise program also extended to our coalition partners. These international exercises further bolstered our allies' resolve in conducting combined missile defense operations and extending partnership into co-development of future capabilities.

Warfighter Contributions to System Development

Warfighters participate in key BMDS tests to build confidence in its capabilities. JFCC–IMD led warfighter participation in the first distributed ground tests on the operational BMDS, geographically distributed from Colorado to Alaska, and Washington to Japan. This test demonstrated the growing sophistication and complexity of BMDS assessments that are increasingly operationally relevant. Furthermore, warfighters collaborated with MDA to successfully conduct key flight tests to bolster our Nation's confidence in the effectiveness of the integrated missile defense capabilities.

Within a 90-day period, we successfully intercepted ballistic missiles at low and high altitudes; in midcourse and terminal phases; and, in endo- and exo-atmospheric environments with the Patriot Advanced Capability-3 (PAC–3), the AEGIS Standard Missile-3, the Terminal High Altitude Area Defense (THAAD), and our long-range Ground-Based Interceptor. Conducting these system-level flight and ground tests required the use of operational assets, the very assets that would be used to defend this nation against a possible North Korea missile attack. JFCC–IMD worked closely with the Combatant Commanders and MDA to coordinate the availability of these assets to ensure sustained operational readiness during the conduct of the system-level tests.

The JFCC–IMD was able to balance the requirements of both operations and tests, but this period of robust achievements underscored the warfighter's requirement to expedite development and deployment of a concurrent testing, training, and operations capability. Concurrent test, training and operations will permit developers and operators to maintain full operational mode of the BMDS while simulta-

neously developing, testing, or training on the system. The need for the concurrent test, training and operations capability is especially pronounced for the one-of-a-kind assets that are shared between the warfighter, developer, and trainer communities.

Absent a mature concurrent test, training and operations capability, JFCC–IMD aggressively conducts an asset management process to ensure the highest level of operational readiness during conduct of materiel development and tests. Supported by an indications and warning system, the asset management process has been the key enabler to operationalize new capabilities, perform operationally relevant tests, and conduct system-wide upgrades. During the past year, the asset management process facilitated warfighters and materiel developers in optimizing the use of the deployed elements while fielding additional assets. In addition, warfighter participation in the flight and ground testing increased our confidence in the system's performance.

Increasing the Capability of the System

JFCC–IMD, in partnership with MDA and the Services, has integrated additional missile defense sensors and shooters to enhance theater and strategic mission capabilities. We have increased the robustness of our sensor capability by deploying a mobile sensor in Japan, increasing the number of AEGIS ships enabled with the long range search and tracking capability, and are deploying a midcourse discrimination sensor in the waters of Alaska. We have continued deployment of the Navy's Ballistic Missile Defense AEGIS Standard Missile-3, Patriot Advanced Capability-3 missiles, and increased the number of Ground-Based Interceptors. Additionally, in my role as the JFCC–IMD Commander, I have been in discussion with European Command to build a stronger partnership with our Allies and to host a midcourse radar and interceptor site to counter the Iranian threat.

The Command, Control, Battle Management, and Communications System is an essential evolutionary component of the BMDS that greatly enhances both planning and execution capabilities. The command and control system contributes to all phases of integrated missile defense from optimizing planning to synchronizing the automated execution of the BMDS. During the past year, upgrades to the command and control system have extended situational awareness, planning, and sensor management capability to key components of U.S. Strategic Command, U.S. Northern Command, and U.S. Pacific Command. Additionally, critical command and control system situational awareness nodes are utilized by the White House, National Military Command Center, and Secretary of Defense Executive Support Center.

As we move forward in the next year, much work remains to be done. We will continue to integrate and conduct cross-geographic combatant commander planning and exercises, deploy new capabilities, and increase allies' involvement in global missile defense. We will continue to advocate for system improvements that close capability gaps and improve system performance. Fielding more capable command and control systems, sensors, and kill vehicles, such as the Multiple Kill Vehicle, will provide the warfighter with a system capable of addressing a broad range of threats. Our continuing goal is to develop a seamless missile defense system, that integrates all available capabilities, to deter and dissuade the proliferation of missile threats, and if necessary, defeat them to protect our Nation, deployed forces, friends, and allies.

AIR AND MISSILE DEFENSE—AN OVERVIEW OF THE FISCAL YEAR 2008 ARMY BUDGET SUBMISSION

In addition to deploying the BMDS, MDA, the Services, and the combatant commanders continue to focus on improving theater air and missile defense capabilities. Both the GMD and Theater Air and Missile Defense Systems are vital for the protection of our homeland, deployed forces, friends, and allies. Air and missile defense is a key component in support of the Army's core competency of providing relevant and ready land power to combatant commanders.

As you are aware, real world events over the past year have increased the relevance, urgency, and importance of theater air and missile defense as well as cruise missile defense. Medium and short-range ballistic missile and cruise missile threats continue to grow, especially in light of increased proliferation of missile defense technology. These threats, combined with Iran's and North Korea's increased interest in nuclear capabilities, are of particular concern.

As highlighted in the 2006 Quadrennial Defense Review, a number of potentially hostile states possess or seek weapons of mass destruction. This is especially troubling when considered along with ballistic and cruise missile proliferation. For these states, weapons of mass destruction—particularly nuclear weapons—provide the means to assert regional domination and intimidate others. As such, the Quadren-

nial Defense Review specifically highlighted the need for integrated defenses against short-, intermediate-, and intercontinental-range ballistic and cruise missile systems.

The House Armed Services Committee Defense Review Report, released in December 2006, concluded that the U.S. force structure must expand and U.S. capabilities must improve to reduce the risk to the security of the American people to an acceptable level and noted that a robust BMDS is critical to defeat strategic threats to the United States and its allies. The report also noted that Operation Enduring Freedom and Operation Iraqi Freedom are consuming key missile defense capabilities, leaving other worldwide commitments under-resourced.

In light of these reports and their findings, the Army, in concert with the Department of Defense and MDA, is taking the necessary steps to ensure that the U.S. homeland, allies and deployed forces are provided the necessary protection from these threats. With that as a background, I would now like to focus on the Army's fiscal year 2008 budget submission for air and missile defense systems. The President's budget, presented to Congress on February 5, includes approximately $1.75 billion with which the Army proposes to execute current Army air and missile defense responsibilities and focus on future development and enhancements of both terminal phase and short-range air and missile defense systems. In short, the Army is continuing major efforts to improve the ability to provide warning, acquire, track, intercept, and destroy theater air and missile threats.

The Army, as part of the joint team, continues its transformation of air and missile defense forces to meet the increasingly sophisticated and asymmetric threat environment encountered by the joint and allied warfighter. The air and missile defense force will meet this threat by adhering to the following imperatives:

- One seamless integrated force
- Advanced engagement concepts
- Defense in depth
- 360-degree defense
- Early and continuous engagements
- Assure friendly use of airspace
- Support information dominance

Integrated Air and Missile Defense

In order to fulfill these imperatives, the Army is transforming its air defense force from its current separate systems architecture to a component-based, network-centric, Integrated Air and Missile Defense system of systems. The Integrated Air and Missile Defense Program focuses on systems integration, common battle command and control, joint enabling networking, and logistics and training to ensure operational requirements, such as force lethality, survivability, transportability and maneuverability, are achieved. Benefits of developing and fielding such a capability include:

- Expanded defended areas against the full-spectrum of threats
- Integrated defense design which eliminates single nodes of failure
- Flexibility in choice of interceptors
- Ability to battle manage weapons, sensors, and inventories
- Seamless training adjustments for battle managers across the Integrated Air and Missile Defense Force
- Closing current capability gaps

The Integrated Air and Missile Defense Program employs an evolutionary acquisition strategy that leads to the objective net-centric system of systems plug-and-fight capability. The approach calls for a restructuring of current Army air and missile defense systems into components of sensors, weapons, and battle management command, control, communications, computers, and intelligence with a standard set of interfaces among the components using a standardized communications network. This modularization of missile defense capabilities will allow Joint Forces Commanders to scale and tailor assets and forces based upon the specific operating environment in which they are employed.

Technology insertions to the Integrated Air and Missile Defense will continue throughout each increment as high-payoff technologies mature and are ready for integration. Incremental development of the program allows the Army to more quickly field new and improved capabilities to the warfighter. The proposed fiscal year 2008 President's budget supports the evolution of an Integrated Air and Missile Defense capability.

Air and Missile Defense Organizational Structure

As part of air defense transformation, the Army has created composite air and missile defense battalions. These battalions address capability gaps, permitting us

to defeat cruise missiles and unmanned aerial vehicles while maintaining our ability to defend critical assets from the ballistic missile threat. Composite air and missile defense battalions will capitalize on the synergies of two previously separate disciplines: short-range air defense and high-to-medium altitude air defense. Additionally, the Army no longer provides an organic air defense artillery battalion to its Divisions. Instead, divisional air defense artillery battalions are pooled at the theater-level to provide air and missile defense protection based on situation and mission requirement. The pool of Army air and missile defense resources will address operational requirements in a tailored and timely manner. This pooling concept supports the Army's effort to move to modular designs that allow force tailoring of units better sized to meet the combatant commanders' needs and homeland security and defense requirements.

Within the context just provided, allow me to briefly discuss the three main component areas of the Army's air and missile defense construct: Terminal Phase Ballistic Missile Defense, Cruise Missile Defense, and Force Protection.

TERMINAL PHASE BALLISTIC MISSILE DEFENSES

The Patriot/Medium Extended Air Defense System (MEADS) capability is designed to counter theater ballistic missile threats in their terminal phase in addition to cruise missiles and other air-breathing threats. Combining these systems with the Terminal High Attitude Area Defense System capability being developed by MDA with a planned fielding in fiscal year 2009, brings an unprecedented level of protection against missile attacks to deployed U.S. forces, friends, and allies well into the future.

Patriot/PAC 3 Overview

Chairman, since the combat debut of the Patriot Air and Missile Defense System during Operation Desert Storm, the Army has continued to implement a series of improvements to address the lessons learned. During Operation Iraqi Freedom, we saw the debut of the improved Patriot Configuration-3 system, including the effective use of the Guidance Enhanced Missile and the Patriot Advanced Capability-3 (PAC–3) missile. PAC–3 is the latest evolution of the phased materiel improvement program to Patriot. Combining developmental testing and operational data, this program enables the development and deployment of a new high-velocity, hit-to-kill, surface-to-air missile with the range, accuracy, and lethality necessary to effectively intercept and destroy more sophisticated ballistic missile threats. Today's Patriot force is a mixture of PAC–2 and PAC–3 configured units. To maximize the full advantage of the PAC–3 capabilities, the Chief of Staff of the Army has directed the Army to pure-fleet the entire Patriot force to the PAC–3 configuration. In response to combatant commanders' requirements, the Vice Chief of Staff of the Army directed the creation of two additional Patriot battalions to help relieve the stress on the Patriot force and increase the Army's strategic responsiveness in the area of terminal ballistic missile defense. These directives underscore the importance of Patriot to the Nation's overall National Military Strategy and are necessary to maximize the capabilities for protecting the security interests of both the United States and our allies.

While Patriot saved many lives defending against Iraqi ballistic missile attacks during Operation Iraqi Freedom, there were some operational deficiencies. The Army has undertaken steps to correct them and address lessons learned. The Army has pursued two thrusts—identification and execution of a $41.6 million program for nine specific Operation Iraqi Freedom fixes and continued aggressive participation in joint interoperability improvements in situational awareness. The development, testing, and materiel release for the nine enhancements is on schedule to be completed by the end of this fiscal year. Several enhancements have already completed fielding. The remaining enhancements are either currently being fielded or are planned to start this spring. Based on the current fielding schedule, all remaining Operation Iraqi Freedom fixes will complete fielding to the units by fiscal year 2009.

The Patriot system remains the Army's mainstay Terminal Air and Missile Defense System and our Nation's only deployed land-based short-to-medium range BMDS capability. The current PATRIOT force must be sustained and recapitalized until MEADS is completely fielded. Fielding of MEADS is scheduled to begin in 2015 and be completed by 2028.

Combined Patriot/MEADS Approach

With the approval of the Defense Acquisition Executive, the Army embarked on a path that merged the Patriot and MEADS programs, establishing the Patriot/MEADS Combined Aggregate Program with the objective of achieving the MEADS

capability through incremental fielding of MEADS major end items into Patriot. Patriot/MEADS Combined Aggregate Program is an important capability that will operate within the BMDS. It is, in fact, a top Army priority system for defense against short- and medium-range tactical ballistic missiles and air breathing threats. The Patriot/MEADS Combined Aggregate Program will be an integral part of the Integrated Air and Missile Defense System of Systems and capable of operating within a Joint, interagency, intergovernmental, and multinational interdependent operational environment. It will provide wide-area protection at strategic, operational, and tactical levels.

The Patriot/MEADS Combined Aggregate Program will also provide battle management command and control in accordance with the IAMD provided common battle command system, introduce lightweight deployable launchers, upgrade the PAC–3 missile, and eventually provide the full MEADS capability to the entire force. By establishing the Patriot/MEADS Combined Aggregate Program, the Joint integrated air and missile defense architecture will become more robust in key ways. First, MEADS enhancements are integrated into the existing system. Second, as lessons are learned from the present missile defense capability, they will be incorporated into the MEADS follow-on system.

MEADS is a cooperative development program with Germany and Italy to field an enhanced ground-mobile air and missile defense capability. The MEADS program, which supports the President's goal for international cooperation in missile defense, will enable the joint integrated air and missile defense community to operate more effectively on future battlefields. MEADS will provide theater level defense of critical assets and continuous protection of a rapidly advancing maneuver force as part of the Joint integrated air and missile defense architecture. Major MEADS enhancements include 360-degree sensor coverage and a strategically deployable and tactically mobile air and missile defense system that can be deployed and controlled as part of the integrated air and missile defense architecture. The PAC–3 Missile Segment Enhancement is currently under development and will be integrated into the MEADS program. The Missile Segment Enhancement Missile will provide a more agile and lethal interceptor that increases the engagement envelope. We are confident that this path will provide our service members, allies, friends, and our Nation with the most capable air and missile defense system possible.

Terminal High Attitude Area Defense System Overview (THAAD)

The Department of Defense is committed to fielding an advanced capability to defend against tactical ballistic missiles as soon as possible. THAAD is designed to provide critical defense against short and medium range ballistic missiles. As a result, MDA is funding and manufacturing four THAAD fire units for the Army in an accelerated fielding that will begin in 2009. This investment represents an initial THAAD capability for the warfighter and the next major step towards a comprehensive, layered theater ballistic missile defense. Follow-on THAAD upgrades are planned in future budgets to meet an ever increasing and evolving threat.

CRUISE MISSILE DEFENSE

In the world today, there exists a real and growing threat from land attack cruise missiles. Cruise missiles are inherently very difficult targets to detect, engage, and destroy because of their small size, low detection signature, and low altitude flight characteristics. When armed with a weapon of mass destruction warhead, the effects from a cruise missile could be catastrophic. The Army's Cruise Missile Defense Program is an integral piece of the Joint cruise missile defense architecture. Critical Army components of the Joint cruise missile defense architecture are provided by the Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System, the Surface-Launched Advanced Medium Range Air-to-Air Missile, the Patriot Missile Segment Enhancement Missile, and an integrated fire control capability inherent in the Integrated Air and Missile Defense System of Systems. We are also working closely with the Joint community to assure development of doctrine that synchronizes our military's full capabilities against the cruise missile threat.

The Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System brings a critically needed capability to detect, track, and identify cruise missile threats. The system will support engagements using the Surface-Launched Advanced Medium-Range Air-to-Air Missile, the Navy Standard Missile, and the Patriot/MEADS weapon systems by providing precision tracking and 360-degree wide-area and over-the-horizon surveillance of land-attack cruise missiles. The Surface-Launched Advanced Medium-Range Air-to-Air Missile will provide maneuver forces with a critical, beyond line-of-sight engagement capability to counter the cruise missile threat, as well as unmanned aerial vehicle threats, over an extended battlespace. The Surface-Launched Advanced Medium-Range Air-to-Air Missile uses

the existing Joint Advanced Medium-Range Air-to-Air Missile currently used by the Air Force and the Navy, thereby capitalizing on Joint commonality on the battlefield.

FORCE PROTECTION

A significant danger in Operation Iraqi Freedom and Operation Enduring Freedom is posed by insurgents employing indirect-fire tactics of quick-attack, low-trajectory, urban-terrain-masked rocket, artillery, and mortar strikes against U.S. forward operating bases in Iraq. To combat this threat, the Army developed Counter-Rocket, Artillery, Mortar (CRAM), an integrated solution of capabilities to provide warning and intercept of rocket, artillery, and mortar threats. CRAM provides a holistic approach to this emerging menace. Horizontal integration across the core functions—command and control, shape, sense, warn, intercept, respond and protect—is providing an integrated modular and scalable capability. This capability provides timely warning of mortar attacks, intercept and defeat of incoming rounds, and accurate location of insurgent mortar crews, enabling a rapid, lethal response. CRAM takes advantage of existing systems and capabilities, combining them in a system of systems architecture to support the warfighter on today's battlefield. The current CRAM solution is truly Joint, in that it uses fielded systems from the Army, Navy and Air Force along with a commercial off-the-shelf system. To date, CRAM has been supported solely through supplemental appropriations. Recognizing the enduring nature of the rocket, artillery, and mortar threat, the Army is exploring ways, to include the use of directed energy, to enhance this capability across all of the core functions, thereby making it even more relevant to the future modular force.

CONCLUSION

Mr. Chairman, the Army, a fully contributing member of the Joint team, is relevant and ready, fighting the war on terrorism, and deterring aggression throughout the world, while transforming to meet future threats. With its responsibilities for GMD, THAAD, and PAC–3/MEADS Combined Aggregate Program, the Army is an integral part of the joint team to develop and field an integrated missile defense for our Nation, deployed forces, friends, and allies. In my role as the Joint Functional Component Commander for Integrated Missile Defense, I will continue the development of a Joint BMDS capability to protect our Nation, deployed forces, friends, and allies. The Army has stepped up to the land-attack cruise missile defense challenge by aggressively developing the Joint, integrated, and networked sensor-to-shooter architecture necessary to defeat the emerging threat. The fiscal year 2008 budget proposal continues the transformation of the Army's air, space, and missile defense force to support the Army's future force, the Joint Integrated Air and Missile Defense System, and our global BMDS. Transformation will continue to define the characteristics of the emerging air, space, and missile defense force and determine how it can best support the future force operating in a Joint, interagency, intergovernmental, and multinational environment.

I appreciate having the opportunity to speak on these important matters and look forward to addressing any questions you or the other committee members may have.

Senator BILL NELSON. I notice three ladies standing up in the back, I would invite some of the gentlemen to offer their seats to the ladies, otherwise, would the ladies come up here and sit up here?

Would the gentleman give the lady a seat? Ma'am, there's a seat right in the back. [Laughter.]

Okay, Dr. McQueary?

STATEMENT OF DR. CHARLES E. MCQUEARY, DIRECTOR, OPERATIONAL TEST AND EVALUATION, OFFICE OF THE SECRETARY OF DEFENSE, DEPARTMENT OF DEFENSE

Dr. MCQUEARY. Chairman Nelson and Senator Sessions, thank you very much for the opportunity to be here with the other distinguished members of the panel.

I have four brief points that I'll make that I'll summarize in more detail in my prepared remarks. But, the four points that I wish to touch upon—I'll briefly give you my view of the test accomplish-

ments that MDA has had in this past year. Second, I'll give you my current assessment of how we look at the Ballistic Missile Defense System (BMDS) and its successes. Third, we'll talk about the implementation of the DOT&E recommendations, which is one of the points that you had made in your letter to me, and the fourth, I'll give you my current view as to where we are on being able to fulfill the Block 2006 assessment requirements that were placed on us in the National Defense Authorization Act of 2006.

First of all, I just will summarize by saying that MDA has had a good year in 2006, as well as the beginning of 2007. General Obering touched upon a number of things that were accomplished during that time period, so there's no point in my repeating any of that, and I won't do so.

I will say that MDA's test program has been a robust program, it's been disciplined, and has demonstrated capability both in ground tests, as well as in flight tests that the system can work in certain scenarios.

My assessment, the second point I wanted to make is the assessment; DOT&E had points of view that were raised in the hearings that were held in 2005 and 2006, but what I can tell you today is that the, in my view, that BMDS has demonstrated a limited capability against a simple foreign threat, and that's the important step forward in the development of such a system. Coupled with the other successes that MDA has had, I think, as well as the integrated ground test, I think BMDS is definitely maturing in a satisfactory way, and the picture looks good.

So, the third point I'd like to make, Mr. Chairman is to review the recommendations very briefly. I will not go into specifics of what they are, but MDA has been very responsive to the inputs we have. We had 26 recommendations that were made in 2005, and all but four of those have been fully implemented based upon our recommendations, and MDA has specific plans in place to address the other four.

In 2006, we had made 15 new recommendations, and of course a report just came out early in the year, but MDA has been working with us, in order to implement plans and test programs that would be responsive to those.

So, in summary, I am very satisfied with the responsiveness of General Obering and his staff in working with us, and being responsive to the descriptions of what we believe from an independent operational test evaluation standpoint needs to be done.

My only role—the role that DOT&E has for MDA, in particular—is to advise what should be done, but I will say that General Obering and his staff have been as responsive as any other program elements that we deal with in our overall responsibilities at DOT&E. So, from my standpoint, being relatively new in the job, I found it very satisfying.

Then the fourth issue is the one on the challenges of being able to do the Block 2006 assessment. There were two failures back in 2005, and the program had to go through a re-evaluation of what the structure should be for testing. I think that has been a good test program. However, due to the limited nature of actual testing that has been done to date, it will be very difficult for DOT&E to provide an analytical, complete assessment of what is needed for

the Block 2006. We'll have much better insight into that as we get farther into the year, and see the additional testing that is being done.

So, in summary, I think that MDA has had a good year, I believe the organization has been very responsive to DOT&E's requests, and I'm very pleased with what I have seen so far, although, as indicated, we do have some recommendations as to what can be done to improve the program, we believe, and I look forward to your questions, so we can get into and probe this in more detail.

[The prepared statement of Dr. McQueary follows:]

PREPARED STATEMENT BY DR. CHARLES E. MCQUEARY

Mr. Chairman, Senator Sessions, and distinguished members of the subcommittee, good afternoon. I am pleased to have this opportunity to speak to you about the testing of the Ballistic Missile Defense System (BMDS). I will briefly cover four areas.

First, I will review what I believe are the major Missile Defense Agency's test accomplishments during the past year.

Second, I will give you my current assessment of the capability of BMDS.

Third, I will provide a review of the implementation of DOT&E recommendations made to the Missile Defense Agency (MDA).

Fourth, I will discuss the factors that will limit my ability to provide a thorough Block 6 assessment as required by the National Defense Authorization Act for Fiscal Year 2006.

FIRST: THE RESULTS

MDA had a good year of testing in 2006.

For the first time in the Ground-based Midcourse Defense program, MDA successfully intercepted a "simple" threat-representative target with an operational booster carrying an operational kill vehicle. Also, for the first time, MDA used data from an operational radar to generate the weapon task plan sent to the interceptor by the fire control system.

Aegis Ballistic Missile Defense was two for two in intercepts of medium-range separating targets. Using Aegis cruisers, operational connectivity, and simulated targets, MDA demonstrated simultaneous ballistic missile defense and ship self-defense capabilities in preparation for a live flight test in 2007.

From November 2005 through January 2007, the Terminal High Altitude Area Defense was four for four on successful flights of the production interceptor. Two of these test flights involved intercept of targets, and both of those intercept flight tests were successful hits.

MDA's ground test program was active, robust, and disciplined, demonstrating BMDS capability and interoperability.

SECOND: MY ASSESSMENT

At the 2005 hearing, DOT&E reported that the integrated ground test results indicated the test bed had the potential to defend against a limited attack, under certain conditions. However, difficulties in the flight test program delayed confirmation of that capability.

During the 2006 hearing, DOT&E reported that the results of the ground tests demonstrated that integration, interoperability, tactics, doctrine, and procedures, were adequate to increase confidence in these aspects of the system. The MDA testing program during 2005 was adequate and appropriate to the developmental maturity of the BMDS.

Today, I can state that the BMDS has demonstrated a limited capability against a simple foreign threat. Coupled with the success of other element-level testing and MDA's integrated ground tests, the BMDS is definitely maturing.

My assessment is bolstered by the fact that MDA is increasing the operational realism of each successive test.

THIRD: THE RECOMMENDATIONS

Mr. Chairman, in your invitation to address the committee, you asked me to provide an assessment of MDA's implementation of DOT&E recommendations made to the agency. I will do that now.

There were 26 recommendations in the fiscal year 2005 annual report. Only 4 recommendations are still open, and MDA is acting on each of them. Two involve ongoing data collection, one involves the future test schedule, and one deals with the test planning process.

There are 15 new recommendations in the fiscal year 2006 annual report. Many of these new recommendations involve demonstrations of specific capabilities during actual intercept tests. MDA is actively considering these recommendations, and has already added several to its test schedule.

I only advise MDA on its developmental test program. I am satisfied with MDA's response to the recommendations in our annual reports. I am pleased that General Obering and his staff recognize the value of our suggestions and recommendations. A more capable BMDS is our mutual goal.

FOURTH: THE CHALLENGES

Despite these successes, BMDS is still maturing as a system which makes it difficult for me to assess Block 06 capability as required by the National Defense Authorization Act for Fiscal Year 2006.

First, to be confident in my assessment of effectiveness I need validated models and simulations for the BMDS. They don't exist today because MDA doesn't have enough flight test data to anchor them. MDA, the multi-service BMDS Operational Test Agency team, and DOT&E personnel are working together to solve this problem. However, there may be insufficient time to fix this problem before we finalize the Block 06 report.

While these models and simulations will be essential to proving the operational capability of BMDS, we cannot use models and simulations as substitutes for live testing. Both General Obering and I agree on this important issue. MDA's testing must be sufficient to have high confidence that the models and simulations are valid representations of the actual performance and capability of the BMDS.

Second, I will have difficulty assessing suitability. BMDS has not operated long enough to gather statistically significant data on its reliability, availability, and maintainability, although the tests to date are very encouraging. MDA and the warfighters are collecting the data, but the amount may be insufficient to reach any confident conclusions about the suitability of BMDS.

In conclusion, MDA experienced a good year with its ground and flight test programs. Individual element successes indicate their capabilities. Integrated ground testing of the BMDS is demonstrating that the warfighters understand and can operate the system confidently and effectively. There is still a long way to go, but MDA's disciplined and principled approach to flight and ground tests is starting to pay real dividends.

This concludes my remarks and I welcome your questions.

Senator BILL NELSON. Mr. Francis?

STATEMENT OF PAUL FRANCIS, DIRECTOR, ACQUISITION AND SOURCING MANAGEMENT, UNITED STATES GOVERNMENT ACCOUNTABILITY OFFICE

Mr. FRANCIS. Thank you, Mr. Chairman, good afternoon.

Good afternoon, Mr. Sessions, and Mr. Inhofe.

I'd like to start out today by saying that what I bring to the discussion is not superior technical knowledge of missile defense, but rather a broad knowledge base that includes many weapons systems, to include missile defense. I also look at large systems like the Army's Future Combat Systems, and Navy shipbuilding, and I have a fair amount of history with acquisition policy and best practices.

I want to recognize at the outset the accomplishments of the missile defense program, and the dedication and hard work that General Obering and his staff have put in to deliver this system.

I'm going to focus on the rather un-glamorous topic of value for money. By statute, we're required to prepare annual assessments of MDA's progress in the areas of cost, schedule and performance. Our March 2007 report is our fourth such assessment.

Yet, each year, while we can report on what MDA accomplished and what it costs, we can't reconcile this with the budget that you approved. I can tell you that costs have gone up for Blocks 2004 and 2006, and that the scope of work has been reduced for each. However, I can't tell you the cost of the work that was deferred, or to what extent you may have to provide funds again for something that has already been funded.

Here's why—MDA reduces a block's scope when work is deferred to cover cost increases. When work is deferred from one block, the cost of that work moves to the next block. However, each block is estimated anew, so that the baseline is reset to zero, and prior work is grandfathered into the new block. When work travels from one block to another, the connection between the actual work done and the amount of work used to justify budget requests is weakened.

Normally, individual programs, like the elements, would capture the cost consequences of deferred work. However, in MDA, the elements do not have total cost estimates. Thus, they do not reflect the cost consequences of deferrals, because totals are not calculated. Total costs also enable one to calculate unit costs. These calculations are not possible on the MDA elements, nor can one readily track the actual cost of an item, like a missile, and compare it with the estimated budget costs for that item.

The reason for this is that MDA has the flexibility to change scope and move funding around to provide what it believes is the most capability. The advantages of management systems, is that you can make decisions that cross program lines, giving you more options and more agility to make tradeoffs. MDA has this, and more. The director is vested with the collective responsibilities of the program manager, the service acquisition executive, and the milestone decision authority.

MDA has the latitude to change scope and goals after funds have been appropriated, without having to seek DOD or congressional approval. Because missile defense has not formally entered the system development and demonstration phase of acquisition, it is not subject to statutes like Nunn-McCurdy, that govern baselines, cost reporting and independent cost estimates.

Also, MDA funds its entire budget with research and development (R&D) monies. MDA can thus move money with comparative ease between activities, such as technology, system development, production and support. MDA can also fund the production of operational assets incrementally, that is, to spread their costs over several years, unlike the full funding of assets that Congress requires of other programs.

These flexibilities were consciously given to MDA, and have helped facilitate tradeoffs and to field the capability quickly. We do not question the need for, or the efficacy of, these decisions. However, the consequence is that it is hard to reconcile value with money. This is important for a couple of reasons.

First, missile defense is the largest weapon system in the budget. The program has funded between $8 billion and $10 billion each year, and for the foreseeable future, we're going to fund at this level.

Second, each of the military Services is also planning large investments over the next 5 to 10 years, and these are going to increase the competition for funds. These include the Air Force purchases of F–22 and Joint Strike Fighter, the Navy's plan to double its shipbuilding budget over the next few years, and the Army's looking for additional funds for its Future Combat Systems (FCS). We have to know what kind of return we're getting on these investments, because overruns or scope reductions represent opportunity costs for other activities that could be undertaken by DOD.

We've made several recommendations to improve the accountability and transparency of missile defense. We believe changes need to be made to the block construct, and that the individual elements should comply with the statutes that ensure accountability of other programs. We also believe MDA should use procurement funds when it's buying operational assets.

MDA is concerned that an over-emphasis on elements will weaken the integration of the missile defense system of systems. We believe changes can be made in such a way that preserve the director's ability to make decisions across program lines, without creating unreasonable delays in decisionmaking.

Mr. Chairman, this concludes my statement, I'll be happy to answer questions.

[The prepared statement of Mr. Francis follows:]

PREPARED STATEMENT BY PAUL FRANCIS

Mr. Chairman and members of the subcommittee: I am pleased to be here today to discuss the Missile Defense Agency's (MDA) strategy for acquiring a Ballistic Missile Defense System (BMDS) and its progress in developing and fielding Block 2006—the second iteration of BMDS.

MDA's mission is to develop and field an integrated, layered BMDS capable of defending the United States, its deployed forces, allies, and friends against enemy ballistic missiles launched from all ranges and during all phases of the missiles' flight. To carry out its mission, MDA is fielding missile defense capabilities in 2-year increments known as blocks. The first block—Block 2004—fielded a limited initial capability that included early versions of Ground-Based Midcourse Defense (GMD); Aegis Ballistic Missile Defense (BMD); Patriot Advanced Capability-3 (PAC–3); and Command, Control, Battle Management, and Communications (C2BMC). Each of these components is an element of the integrated BMDS. During calendar years 2006 and 2007, MDA is focusing Block 2006 to enhance and field four BMDS elements—GMD, Aegis BMD, Sensors, and C2BMC. Block 2006 is not only expected to field additional assets, but it also continues the evolution of Block 2004 by providing improved GMD interceptors, enhanced Aegis BMD missiles, upgraded Aegis BMD ships, a Forward-Based X-Band Transportable radar, and enhancements to the C2BMC software.

The National Defense Authorization Acts for Fiscal Years 2002 and 2005 mandate that we prepare annual assessments of MDA's ongoing cost, schedule, testing, and performance progress. We issued our most recent report on March 15, 2007.[1] My statement today will focus on the issues covered in that report, specifically:

- MDA's progress toward developing the Block 2006 configuration of the BMDS,
- the flexibility granted to MDA and its effect on oversight and accountability, and
- the status of MDA's efforts to improve its quality processes.

SUMMARY

MDA continues to make progress on missile defense, but costs have grown and less work is being completed than planned. The fielding of additional assets and the first end-to-end test of GMD were notable accomplishments in fiscal year 2006, as

[1] GAO, Defense Acquisitions: Missile Defense Acquisition Strategy Generates Results but Delivers Less at a Higher Cost, GAO–07–387 (Washington, DC: Mar. 15, 2007).

was being able to put BMDS on alert status. Yet, MDA will not meet its original Block 2006 cost, fielding, or performance goals. MDA will field fewer assets than planned, which will cause a commensurate decrease in performance. Although scope has been reduced, costs are expected to increase by about $1 billion. There is no baseline against which to measure cost. For several reasons, we cannot be precise about the actual cost of Block 2006. MDA defers work from block to block and counts the cost of deferred work as a cost of the block in which the work is performed even though that work benefits the original block. For example, work deferred from Block 2004 is counted as a cost of Block 2006. Element program offices report costs inconsistently, with most underreporting costs. The cost of Block 2006 may change further because MDA may defer other work from Block 2006 until Block 2008 to cover $478 million in fiscal year 2006 budget overruns experienced by element prime contractors. We could not assess whether MDA is likely to achieve its revised performance goal because too few tests have been completed to have confidence in the models and simulations used to predict performance. Overall, the block approach has had advantages for fielding capabilities incrementally, but it has not proven to be a good construct for reconciling actual cost and performance with the justifications that MDA submits to support its budget request.

Because the BMDS program has not formally entered system development and demonstration, application of laws that are designed to facilitate oversight and accountability of Department of Defense (DOD) acquisition programs has effectively been deferred. This gives MDA unique latitude to manage the BMDS. Specifically, the BMDS cost, schedule, and performance baseline does not have to be approved by anyone outside MDA. MDA is not yet required to obtain independent assessments of each configuration's cost or test results. Unlike other programs, MDA is permitted to use research and development funds to incrementally fund all activities, including the purchase and support of operational assets. MDA keeps others informed, but it does not need their approval. Collectively, this flexibility enables MDA to be more agile in its decisionmaking. By the same token, MDA can revise its own baseline to field fewer assets than planned, defer work to a future block, and increase planned cost. Over time, it becomes difficult to reconcile cost and outcomes against original goals and to determine the value of the work accomplished. Ultimately, Congress may know that it is getting less than expected for its investment, but it will not necessarily know the cost of what it did receive or whether it is being asked to again appropriate funds for work that had been scheduled in a prior block but could not be completed because its funding was diverted to pay for other activities. The foregoing does not mean that MDA has acted inconsistently with the authorities it has been granted. Rather, MDA has the sanctioned flexibility to manage exactly as it has. It could be argued that without this flexibility, the initial capability fielded last year and put on alert would not have been possible. Yet, the question remains as to whether this degree of flexibility should be retained for a program that is planning to spend on the order of $10 billion a year for the foreseeable future.

MDA auditors report that quality deficiencies are declining and on-time deliveries are improving as corrective measures are implemented. For example, MDA quality audits show that one key supplier has decreased open quality issues by 64 percent, reduced test failures by 43 percent, and increased on-time deliveries by 9 percent. The mechanisms being used to improve quality assurance processes include the development of a teaming approach to restore reliability in key suppliers, conducting regular quality audits, adjusting award fee plans to encourage contractors to maintain a good quality assurance program and implement industry best practices, and continuing to incorporate key quality provisions into the agency's prime contracts.

In our March 2007 report, we recommended that MDA establish firm baselines for those elements considered far enough along to be in system development and demonstration, and report against those baselines; propose an approach for those same elements that provides information consistent with the acquisition laws that govern baselines and unit cost reporting, independent cost estimates, and operational test and evaluation; include in blocks only those elements that will field capabilities during the block period and develop a firm block baseline that includes the unit cost of its assets; request and use procurement funds, rather than research, development, test, and evaluation funds, to acquire fielded assets; and conduct an independent evaluation of the Airborne Laser (ABL) and Kinetic Energy Interceptor (KEI) elements prior to making a decision on the future of the programs.

DOD partially concurred with the report's first three recommendations, but did not agree to use procurement funds to acquire fielded assets or to conduct an independent evaluation of the ABL and KEI elements. In partially agreeing, DOD recognized the need to provide greater program transparency and committed to providing information consistent with acquisition laws that govern baselines and unit cost re-

porting. However, DOD objected to the element-centric approach recommended, believing that this would detract from managing the BMDS as a single, integrated system. DOD also stated that reporting at the BMDS-level in accordance with our third recommendation would appear to be inconsistent with reporting at the element level. We continue to believe that all recommended changes are needed to provide a better balance between MDA's flexibility and BMDS program transparency. Because DOD awards contracts and requests funding by individual elements that compose the BMDS, we believe that the element approach is the best way to achieve increased program transparency. However, a BMDS-level baseline derived from the capabilities that individual elements yield is needed to describe and manage a BMDS-wide capability. We also believe that the use of procurement funds contributes to program transparency by making clear at the outset the size of the investment being requested in fielded assets. Finally, we continue to believe that an independent assessment of the ABL and KEI capabilities can provide a transparent basis for making decisions on the future of the programs, but we did revise the recommendation to specify that the assessment should follow key demonstrations in 2009.

BACKGROUND

Missile defense is important because at least 25 countries now possess or are acquiring sophisticated missile technology that could be used to attack the United States, deployed troops, friends, and allies. MDA's mission is to develop and field an integrated, layered BMDS capable of defending against enemy ballistic missiles launched from all ranges and during all phases of the missiles' flight. DOD has spent and continues to spend large sums of money to defend against this threat. Since the mid-1980s, about $107 billion has been spent, and over the next 5 years, another $49 billion is expected to be invested. While the initial set of BMDS assets was fielded during 2004–2005, much of the technical and engineering foundation was laid by this prior investment. DOD also expects to continue investing in missile defense for many more years as the system evolves into one that can engage an enemy ballistic missile launched from any range during any phase of the missile's flight.

To enable MDA to field and enhance a missile defense system quickly, the Secretary of Defense, in 2002, directed a new acquisition strategy. The Secretary's strategy included removing the BMDS program from DOD's traditional acquisition process until a mature capability was ready to be handed over to a military service for production and operation. Therefore, development of the BMDS program is not segmented into concept refinement, technology development, and system development and demonstration phases, as other major defense acquisition programs are. Instead, MDA initiates one development phase that incorporates all acquisition activities and that is known simply as research and development. MDA also has approval to use research and development funds, rather than procurement funds, to acquire assets that could be made available for operational use.

To carry out its mission, MDA is fielding missile defense capabilities in 2-year increments known as blocks. The first block—Block 2004—fielded a limited initial capability that included early versions of GMD, Aegis BMD, PAC–3, and C2BMC. This was the capability that was put on alert status in 2006. MDA formally began a second BMDS block on January 1, 2006, that will continue through December 31, 2007. This block is expected to provide protection against attacks from North Korea and the Middle East. During the 2-year block timeframe, MDA is focusing its program of work on the enhancement and fielding of additional quantities of the GMD, Aegis BMD, and C2BMC elements, as well as fielding a Forward-Based X-Band radar that is part of the Sensors element. When MDA defined the block in March 2005, shortly after submitting its fiscal year 2006 budget request to Congress, it also included three other elements—ABL, Space Tracking and Surveillance System (STSS), and Terminal High Altitude Area Defense (THAAD)—that are primarily developmental in nature. According to MDA, these elements were included in the block even though they were not expected to be operational until future blocks because the elements offered some emergency capability during the block timeframe. In March 2006, MDA removed THAAD from Block 2006. According to MDA, this action better aligned resources and fielding plans. The development of two other elements—Multiple Kill Vehicle (MKV) and KEI—also continued in fiscal year 2006, but these elements were not considered part of Block 2006 because, according to MDA officials, the elements provide no capability—emergency or operational—during the block.

The bulk of the funding that MDA requests for the BMDS each fiscal year is for the development, fielding, and sustainment of BMDS elements. For example, in fiscal year 2006, funding for the nine BMDS elements collectively accounted for 72 per-

cent of MDA's research and development budget. MDA requests funds for each of these elements, with the exception of C2BMC and THAAD, under separate budget line items. In addition, MDA issues separate contracts for each of the nine elements.

Prior to beginning each new block, MDA establishes and submits block goals to Congress. These goals present the business case for the new block. MDA presented its Block 2006 goals to Congress in March 2005, shortly after submitting its fiscal year 2006 budget. At that time, MDA told Congress that the agency expected to field the following assets: up to 15 GMD interceptors, an interim upgrade of the Thule Early Warning Radar, a Forward-Based X-Band radar, 19 Aegis BMD missiles, 1 new Aegis cruiser for the missile defense mission, 4 new Aegis destroyers capable of providing long-range surveillance and tracking, and 8 Aegis destroyers upgraded for the engagement mission. MDA's cost goal for the development of the six elements that compose the block, the manufacture of assets being fielded, and logistical support for fielded assets was $19.3 billion.[2] MDA also notified Congress of the Block 2006 performance goals established for the BMDS. These goals were composed of numerical values for the probability of engagement success, the land area from which the BMDS could deny a launch, and the land area that the BMDS could defend.[3] Fiscal year testing goals were also established by element program offices, but these goals were not formally reported to Congress.

We examined numerous documents and held discussions with agency officials. In determining the elements' progress toward Block 2006 goals, we looked at the accomplishments of six BMDS elements—ABL, Aegis BMD, BMDS Sensors, C2BMC, GMD, and STSS—that compose the Block 2006 configuration. Our work included examining System Element Reviews, test plans and reports, production plans, and Contract Performance Reports. We also interviewed officials within each element program office and within MDA functional offices. In assessing whether MDA's flexibility impacts BMDS oversight and accountability, we examined documents such as those defining MDA's changes to Block 2006 goals, acquisition laws for major DOD programs, and BMDS policy directives issued by the Secretary of Defense. We examined the current status of MDA's quality assurance program by visiting various contractor facilities and holding discussions with MDA officials, such as officials in the Office of Quality, Safety, and Mission Assurance. We performed our work from June 2006 through March 2007 in accordance with generally accepted government auditing standards

MDA HAS MADE PROGRESS WITH BLOCK 2006, BUT SCOPE HAS BEEN REDUCED AND COSTS HAVE GONE UP

MDA made progress during fiscal year 2006, but it will not achieve the goals it set for itself in March 2005. One year after establishing its Block 2006 goals, the agency informed Congress that it planned to field fewer assets, reduce performance goals, and increase the block's cost goal. It is also likely that in addition to fielding fewer assets, other Block 2006 work will be deferred to offset growing contractor costs. MDA is generally on track to meet its revised quantity goals, but the performance of the BMDS cannot yet be fully assessed because there have been too few flight tests conducted to anchor the models and simulations that predict overall system performance. Several elements continue to experience technical problems that pose questions about the performance of the fielded system and could delay the enhancement of future blocks. In addition, the Block 2006 cost goal cannot be reconciled with actual costs because work travels to and from other blocks and individual element program offices report costs inconsistently.

During the first year of Block 2006, MDA continued to improve the BMDS by enhancing its performance and fielding additional assets. In addition, the BMDS elements achieved some notable test results. For example, the GMD element completed its first successful intercept attempt since 2002. The test was also notable because it was an end-to-end test of one engagement scenario, the first such test that the program has conducted. Also, the Aegis BMD element conducted a successful intercept test of its more capable Standard Missile–3 design that is being fielded for the first time during Block 2006.

In March 2006, soon after the formal initiation of Block 2006, MDA announced that events such as hardware delays, technical challenges, and budget cuts were causing the agency to field fewer assets than originally expected. MDA's goal now calls for fielding three fewer GMD interceptors; deferring the upgrade of the Thule

[2] We have adjusted the cost goal reported to Congress to reflect MDA's removal of the THAAD element and its future development cost from Block 2006.

[3] Specifics of the BMDS performance goals are classified and cannot be presented in an open forum.

radar until Block 2008, when it can be fully upgraded; producing four fewer Aegis BMD missiles; upgrading one less Aegis destroyer for the engagement mission; and delivering three C2BMC Web browsers rather than the more expensive C2BMC suites. With the exception of the GMD interceptors, MDA is on track to deliver the revised quantities. The GMD program planned to emplace eight interceptors during calendar year 2006, but was only able to emplace four. Program officials told us that the contractor has increased the number of shifts that it is working and that this change will accelerate deliveries. However, to meet its quantity goal, the GMD program will have to more than double its interceptor emplacement rate in 2007.

MDA also reduced the performance expected of Block 2006 commensurate with the reduction in assets. However, insufficient data are available to determine whether MDA is on track to meet the new goal. Although the GMD test program has achieved some notable results, officials in DOD's Office of the Director of Operational Test and Evaluation told us that the element has not completed sufficient tests to provide a high level of confidence that the BMDS can reliably intercept intercontinental ballistic missiles. Further testing is needed as well to confirm that GMD can use long-range tracking data developed by Aegis BMD to prepare—in real time—a weapon system task plan for GMD interceptors.

Delayed testing and technical problems may also impact the performance of the current and future configurations of the BMDS. For example, the performance of the Block 2006 configuration of the Aegis BMD missile is unproven because design changes in the missile's solid attitude and divert system and one burn pattern of the third stage rocket motor were not flight-tested before they were cut into the production line. The current configuration of the GMD interceptor also continues to struggle with an anomaly that has occurred in each of the element's flight tests. The anomaly has not yet prevented the program from achieving its primary test objectives, but neither its source nor a solution has been clearly identified or defined. The reliability of some GMD interceptors remains uncertain as well because inadequate mission assurance/quality control procedures may have allowed less reliable or inappropriate parts to be incorporated into the manufacturing process. Program officials plan to introduce new parts into the manufacturing process, but not until interceptor 18. MDA also plans to retrofit the previous 17 interceptors, but not until fiscal year 2009. In addition to the performance problems with elements being fielded, the ABL element that is being developed to enhance a future BMDS configuration experienced technical problems with its Beam Control/Fire Control component. These problems have delayed a lethality demonstration that is needed to demonstrate the element's leading-edge technologies. ABL is an important element because if it works as desired, it will defeat enemy missiles soon after launch, before decoys are released to confuse other BMDS elements. MDA plans to decide in 2009 whether ABL or KEI, whose primary boost phase role is to mitigate the risk in the ABL program, will become the BMDS boost phase capability.

While MDA reduced Block 2006 quantity and performance goals, it increased the block's cost goal from about $19.3 billion to approximately $20.3 billion.[4] The cost increases were caused by the addition of previously unknown operations and sustainment requirements, realignment of the GMD program to support a successful return to flight, realignment of the Aegis BMD program to address technical challenges and invest in upgrades, and preparations for round-the-clock operation of the BMDS. Although MDA is expected to operate within its revised budget of $20.3 billion, the actual cost of the block cannot be reconciled with the cost goal. To stay within its Block 2004 budget, MDA shifted some of that block's work to Block 2006 and is counting it as a cost of Block 2006, which overstates Block 2006 cost. In addition, MDA officials told us that it is likely that some Block 2006 work will be deferred until Block 2008 to cover the $478 million fiscal year 2006 budget overruns experienced by five of the six element prime contractors. If MDA reports the cost of deferred work as it has in the past, the actual cost of Block 2006 will be complicated further. Another factor complicating the reconciliation of Block 2006 cost is that the elements report block cost inconsistently. Some elements appropriately include costs that the program will incur to reach full capability, while others do not.[5]

MDA'S FLEXIBILTY MAKES OVERSIGHT AND ACCOUNTABILITY MORE DIFFICULT

Because the BMDS has not formally entered the system development and demonstration phase of the acquisition cycle, it is not yet required to apply several im-

[4] Specific details regarding the cost increase can be found in GAO–07–387.

[5] An element has reached full capability if it has completed all system-level testing and has shown that it meets expectations. At this state, all doctrine, organization, training, material, leadership, personnel, and facilities are in place.

portant oversight mechanisms contained in certain acquisition laws that, among other things, provide transparency into program progress and decisions. This has enabled MDA to be agile in decisionmaking and has facilitated fielding an initial BMDS capability quickly. On the other hand, MDA operates with considerable autonomy to change goals and plans, making it difficult to reconcile outcomes with original expectations and to determine the actual cost of each block and of individual operational assets.

Over the years, a framework of laws has been created that make major defense acquisition programs accountable for their planned outcomes and cost, give decisionmakers a means to conduct oversight, and ensure some level of independent program review. The application of many of these laws is triggered by a program's entry into system development and demonstration. To provide accountability, once major defense programs cross this threshold, they are required by statute to document program goals in an acquisition program baseline that as implemented by DOD has been approved by a higher-level DOD official prior to the program's initiation. The baseline provides decisionmakers with the program's best estimate of the program's total cost for an increment of work, average unit costs for assets to be delivered, the date that an operational capability will be fielded, and the weapon's intended performance parameters. Once approved, major acquisition programs are required to measure their program against the baseline, which is the program's initial business case, or obtain the approval of a higher-level acquisition executive before making significant changes. Programs are also required to regularly provide detailed program status information to Congress, including information on cost, in Selected Acquisition Reports. In addition, Congress has established a cost-monitoring mechanism that requires programs to report significant increases in unit cost measured from the program baseline.[6]

Other statutes provide for independent program verifications and place limits on the use of appropriations. For example, 10 U.S.C. 2434 prohibits the Secretary of Defense from approving system development and demonstration unless an independent estimate of the program's life-cycle cost has been conducted by the Secretary. In addition, 10 U.S.C. 2399 requires completion of initial operational test and evaluation before a program can begin full-rate production. These statutes ensure that someone external to the program examines the likelihood that the program can be executed as planned and will yield a system that is effective and suitable for combat. The use of an appropriation is also controlled so that it will not be used for a purpose other than the one for which it was made, except as otherwise provided by law. Research and development appropriations are typically specified by Congress to be used to pay the expenses of basic and applied scientific research, development, test, and evaluation. On the other hand, procurement appropriations are, in general, to be used for production and manufacturing. In the 1950s, Congress established a policy that items being purchased with procurement funds be fully funded in the year that the item is procured. This is meant to prevent a program from incrementally funding the purchase of operational systems. Full funding ensures that the total procurement costs of weapons and equipment are known to Congress upfront and that one Congress does not put the burden on future Congresses of deciding whether they should appropriate additional funds or expose weapons under construction to uneconomic start-up and stop costs.

The flexibility to defer application of specific acquisition laws has benefits. MDA can make decisions faster than other major acquisition programs because it does not have to wait for higher-level approvals or independent reviews. MDA's ability to quickly field a missile defense capability is also improved because assets can be fielded before all testing is complete. MDA considers the assets it has fielded to be developmental assets and not the result of the production phase of the acquisition cycle. Additionally, MDA enjoys greater flexibility than other programs in the use of its funds. Because MDA uses research and development funds to manufacture assets, it is not required to fully fund those assets in the year of their purchase. Therefore, as long as its annual budget remains fairly level, MDA can request funds to address other needs.

On the other hand, the flexibilities granted MDA make it more difficult to conduct program oversight or to hold MDA accountable for the large investment being made in the BMDS program. Block goals can be changed by MDA, softening the baseline used to assess progress toward expected outcomes. Similarly, because MDA can redefine the work to be completed during a block, the actual cost of a block cannot be compared with the original cost estimate. MDA considers the cost of deferred work, which may be the delayed delivery of assets or other work activities, as a cost of the block in which the work is performed even though the work benefits or was

[6] 10 U.S.C. 2433, known as Nunn-McCurdy.

planned for a prior block. Further, MDA does not track the cost of the deferred work and, therefore, cannot make adjustments that would match the cost with the block that is benefited. For example, during Block 2004, MDA deferred some planned development, deployment, characterization, and verification activities until Block 2006 so that it could cover contractor budget overruns. The costs of the activities are now considered part of the cost of Block 2006. Also, although Congress provided funding for these activities during Block 2004, MDA used these funds for the overruns and will need additional funds during Block 2006 to cover their cost. Planned and actual unit costs of fielded assets are equally difficult to reconcile. Because MDA is not required to develop an approved acquisition program baseline, it is not required to report the expected average unit cost of assets. Also, because MDA is not required to report significant increases in unit cost,[7] it is not easy to determine whether an asset's actual cost has increased significantly from its expected cost.

Finally, using research and development funds to purchase fielded assets further reduces cost transparency because these dollars are not covered by the full-funding policy as are procurement funds. Therefore, when a program for a 2-year block is first presented in the budget, Congress is not necessarily fully aware of the dimensions and cost of that block. For example, although a block may call for the delivery of a specific number of interceptors, the full cost of those interceptors is requested over 3 to 5 years. Calculating unit costs from budget documents is difficult because the cost of components that will become fielded assets may be spread across 3 to 5 budget years—a consequence of incremental funding.

MDA AUDITS SHOW IMPROVEMENT IN QUALITY PROCESSES

During Block 2004, poor quality control procedures caused the missile defense program to experience test failures and slowed production. MDA has initiated a number of actions to correct quality control weaknesses, and the agency reports that these actions have been largely successful. Although MDA continues to identify quality assurance procedures that need strengthening, recent audits by MDA's Office of Quality, Safety, and Mission Assurance show such improvements as increased on-time deliveries, reduced test failures, and sustained improvement in product quality.

MDA has taken a number of steps to improve quality assurance. These include developing a teaming approach to restore the reliability of key suppliers, conducting regular quality inspections to quickly identify and find resolutions for quality problems, adjusting award fee plans to encourage contractors to maintain a good quality assurance program and encourage industry best practices, as well as placing MDA-developed assurance provisions on prime contracts. For example, as early as 2003, MDA made a critical assessment of a key supplier's organization and determined that the supplier's manufacturing processes lacked discipline, its corrective action procedures were ineffective, its technical data package was inadequate, and personnel were not properly trained. The supplier responded by hiring a Quality Assurance Director, five quality assurance professionals, a training manager, and a scheduler. In addition, the supplier installed an electronic problem-reporting database, formed new boards—such as a failure review board—established a new configuration management system, and ensured that manufacturing activity was consistent with contract requirements. During different time periods between March 2004 and August 2006, MDA measured the results of the supplier's efforts and found a 64-percent decrease in open quality control issues, a 43-percent decline in test failures, and a 9-percent increase in on-time deliveries. MDA expanded its teaming approach in 2006 to another problem supplier and reports that many systemic solutions are already underway.

During fiscal year 2006, MDA's audits continued to identify both quality control weaknesses and quality control procedures that contractors are addressing. During 2006, the agency audited six contractors and identified 372 deficiencies and observations.[8] As of December 2006, the 6 contractors had collectively closed 157, or 42 percent, of the 372 audit findings. MDA also reported other signs of positive results. For example, in 2006, MDA conducted a follow-on audit of Raytheon, the subcon-

[7] Because the BMDS or its major elements have not been designated by MDA as being in system development and demonstration, no acquisition program baseline is required under 10 U.S.C. § 2435. Thus there is no basis for determining unit cost under 10 U.S.C. § 2433 (also known as Nunn-McCurdy), which requires calculation of unit cost from the baseline. Further, for the same reason, only limited Selected Acquisition Reports to Congress on program status are generated (10 U.S.C. 2432(h)) that do not include unit costs.

[8] Deficiencies are considered more serious and are recognized when contractors do not comply with a contractual or internal procedure requirement. On the other hand, observations are made when a contractor fails to employ an MDA or industry best practice.

tractor for GMD's exoatmospheric kill vehicle. A 2005 audit of Raytheon had found that the subcontractor was not correctly communicating essential kill vehicle requirements to suppliers, did not exercise good configuration control, and could not build a consistent and reliable product. The 2006 audit was more positive, reporting less variability in Raytheon's production processes, increasing stability in its statistical process control data, fewer test problem reports and product waivers, and sustained improvement in product quality.

ACTIONS RECOMMENDED IN OUR RECENT REPORT

In our March 15, 2007, report, we made several recommendations to DOD to increase transparency in the missile defense program. These included:

- Develop a firm cost, schedule, and performance baseline for those elements considered far enough along to be in system development and demonstration, and report against that baseline.
- Propose an approach for those same elements that provides information consistent with the acquisition laws that govern baselines and unit cost reporting, independent cost estimates, and operational test and evaluation for major DOD programs. Such an approach could provide necessary information while preserving the MDA Director's flexibility to make decisions.
- Include in blocks only those elements that will field capabilities during the block period and develop a firm cost, schedule, and performance baseline for that block capability, including the unit cost of its assets.
- Request and use procurement funds, rather than research, development, test, and evaluation funds, to acquire fielded assets.

DOD partially agreed with the first three recommendations and recognized the need for greater program transparency. It committed to provide information consistent with the acquisition laws that govern baselines and unit cost reporting, independent cost estimates, and operational test and evaluation. DOD did not agree to use elements as a basis for this reporting, expressing its concern that an element-centric approach to reporting would have a fragmenting effect on the development of an integrated system. We respect the need for the MDA Director to make decisions across element lines to preserve the integrity of the system of systems. We recognize that there are other bases rather than elements for reporting purposes. However, we believe it is essential that MDA report in the same way that it requests funds. Currently MDA requests funds and contracts by element, and at this time, that appears to be the most logical way to report. MDA currently intends to modify its current block approach. We believe that a management construct like a block is needed to provide the vehicle for making system-of-system decisions and to provide for system-wide testing. However, at this point, the individual assets to be managed in a block—including quantities, cost, and delivery schedules—can only be derived from the individual elements.

Mr. Chairman, this concludes my statement. I would be pleased to respond to any questions you or members of the subcommittee may have.

Senator BILL NELSON. Thank you.

Mr. Green?

STATEMENT OF BRIAN R. GREEN, DEPUTY ASSISTANT SECRETARY OF DEFENSE FOR STRATEGIC CAPABILITIES, OFFICE OF THE UNDER SECRETARY OF DEFENSE FOR POLICY BEFORE THE SUBCOMMITTEE ON STRATEGIC FORCES, DEPARTMENT OF DEFENSE

Mr. GREEN. Chairman Nelson, Ranking Member Sessions, and members of the subcommittee, it's a pleasure to appear before you today to discuss the policy and strategic rationale underpinning the fiscal year 2008 missile defense budget request.

In 2001, President Bush directed us to field an initial missile defense capability by 2004, and to improve it over time to meet the changing threat, and to take advantage of emerging technology. He also directed us to extend the benefits of missile defense to our friends and allies.

I would like to discuss today our progress in meeting this direction, and focus on an effort that is key to enabling us to meet these goals, the deployment of U.S. missile defenses in Europe.

Missile defense continues to be one of the administration's highest priorities, driven by rapidly-evolving missile threats. Aggressive and unpredictable adversaries such as Iran and North Korea, continue to challenge our notions of deterrence and defense. Surprise —strategic, tactical, and technical—is an expected feature of the post-Cold War strategic environment. In this environment, we can no longer rely solely on offensive capabilities to deter our adversaries. We must have other options, including missile defenses, that both reinforce deterrence, and hedge against its potential failure.

I'm pleased to report that we've made substantial and rapid progress in meeting the President's direction to deploy missile defense capabilities. These have been well-described by General Obering.

My colleagues seated with me at the table today who represent the developers, the testers and the warfighters, deserve the Nation's gratitude, and I would be remiss if I didn't thank Congress and this Committee for its support as well.

We're also making progress in missile defense cooperation with our allies and our friends. Today, 15 additional countries, including 9 NATO nations alone, are engaged in missile defense efforts of some kind, whether by hosting key facilities or assets on their territory, or actively discussing this possibility, or pursuing R&D programs, examining options in technical working groups, signing cooperative agreements with the U.S., or maintaining capabilities.

In January of this year, President Bush directed us to proceed with negotiations to base U.S. long-range missile defenses in Europe. These defenses are intended to counter the increasing Middle Eastern missile threat. Our intelligence community assesses that Iran would be able to develop an ICBM capability before 2015, if it chose to do so, and we must start now in order to address this threat in a timely manner.

The current plans call for basing 10 GBIs in Poland similar to those currently deployed in Alaska and California, and a midcourse radar in the Czech Republic.

The deployment of these U.S. missile defense assets in Europe will have many benefits. They would be capable of intercepting not only ICBMs, but also intermediate-range ballistic missiles launched out of the Middle East. The U.S. goal is to optimize the defensive coverage of both Europe, and the U.S. It would provide a second layer of defense for the United States.

With the protection afforded by these U.S. defensive capabilities in Europe, NATO member-states could resist attempts by hostile states to intimidate or coerce the alliance or its members from taking actions in a coalition. Strengthening our European allies and the NATO alliance, in turn, enhances U.S. security.

The defense of Europe against longer-range threats, similar to those which the United States is defending itself, will be important to keep U.S. and NATO security tightly coupled. Such defenses would provide additional decision space for national leaders, includ-

ing the President, for example, by allowing them to delay or defer resorting to offensive responses to an attack.

Missile defenses provide another avenue for burdensharing, and strengthening relationships with important allies. When negotiations are successfully concluded, Poland and the Czech Republic will be providing a significant contribution to the collective security of the NATO alliance by hosting BMD assets.

I also want to comment briefly on the benefits derived specifically from the basing mode that we've chosen to pursue, that is, ground-basing interceptors and silos. Many of our missile defense, assets such as Aegis and PAC–3, are mobile or transportable. The advantage of mobility is flexibility. We can move assets into place as circumstances warrant.

There's also an advantage to ground-based silos, and that advantage is persistence. If we field long-range interceptors and silos in Europe, we will have a capability that is always there—before and during a crisis. With our allies and potential adversaries, we'll know with certainty that a missile defense capability is in place. These missile defense assets, then, will be able to both assure allies, and to deter and dissuade adversaries at all times, once they're fielded.

While we see many benefits from a deployment in Europe, some in Russia have expressed their opposition, contending that our limited missile defenses constitute a threat to the strategic balance. I would say, first and foremost, that we no longer look at Russia as a strategic adversary, and therefore, there is no strategic balance to disturb. Furthermore, physics and geography prove that ground-based missile defense interceptors and a X-band radar for a mid-course tracking and discrimination of warheads, located in Central Europe, would have no capability against an ICBM launched out of Russia at the United States in a one-on-one engagement.

Finally, 10 interceptors in Europe are simply not a threat to Russia, and cannot diminish Russia's deterrent of hundreds of missiles, and thousands of warheads. Providing Russia transparency and predictability in our missile defense policy, plans, and programs is certainly in the interest of the United States. We've provided this in the past, and are continuing to keep Russia informed about the status of our programs and decisions. We will also explore the possibility of additional confidence-building measures, and we seek opportunities to cooperate in missile defense in the future. President Bush recently underscored that point to President Putin.

I mentioned previously that a European interceptor site will provide long-range missile defense coverage to many NATO allies. Missile defense has been a topic of discussion and debate at NATO for quite some time, and the U.S. plan to begin fielding missile defense elements in Europe has served to focus and intensify those discussions.

The Alliance has already taken several important steps demonstrating its support for missile defense. With its Active-Layered Theater Ballistic Missile Defense (ALTBMD) Program, the Alliance has decided to develop a capability to defend its deployed forces from shorter-range missile attack.

Recognizing a growing threat to NATO territory, the Alliance agreed at the 2002 Prague Summit to initiate the NATO Missile

Defense Feasibility Study to examine the defense of alliance territory and population centers from ballistic missile attack. This study was completed and presented to the 2006 Riga Summit. At Riga, the Alliance endorsed the study's conclusion that defense of alliance territory and population centers is technically feasible.

We are continuing to consult extensively with NATO to ensure that all of our allies understand the contribution missile defense can make to alliance security and solidarity. Although the alliance has yet to make the collective decision to pursue continental defense, a number of allies have demonstrated support for long-range missile defense. Poland and the Czech Republic have expressed interest in hosting long-range missile defense assets, the United Kingdom agreed to an upgrade to the Fylingdales radar, and Denmark has agreed to a similar upgrade of the early-warning radar at Thule, Greenland.

In conclusion, we have made great progress in meeting the goals the President set for us over 4 years ago, and we continue to press forward with the proposed deployment of U.S. missile defenses in Europe.

That concludes my statement. Thank you for your attention. I appreciate the opportunity to be here, and I look forward to your questions.

[The prepared statement of Mr. Green follows:]

PREPARED STATEMENT BY BRIAN R. GREEN

INTRODUCTION

Chairman Nelson, Ranking Member Sessions, and members of the subcommittee, it is a pleasure to appear before you today. I am here to discuss missile defense in the context of national defense strategy and to review our progress in carrying out the President's ballistic missile defense policy.

NEW STRATEGIC ENVIRONMENT

Ballistic missile defense remains a top priority of the administration. This priority is driven by needs defined by the new and evolving strategic environment, and continues to be validated by recent events.

Our national security focus changed in the early 1990s with the demise of the Soviet Union. We realized that we faced a broader range of threats from a broader range of aggressive and unpredictable adversaries. Threats posed by nations, such as Iran and North Korea, and transnational non-state actors, such as al Qaeda, continue to challenge our notions of deterrence and defense. Surprise—strategic, tactical, and technical—is an expected feature of the security landscape. While deterrence remains the cornerstone of our strategy, we recognize an increased risk that deterrence may fail. Under such circumstances, missile defenses are highly desirable because they both reinforce deterrence and hedge against its failure.

Potential adversaries see ballistic missiles armed with weapons of mass destruction (WMD) as low-cost, high impact asymmetric options to counter other U.S. military advantages. WMD and ballistic missile delivery vehicles have become the weapon of choice for countries seeking to coerce their neighbors and limit U.S. freedom of action. LTG Michael Maples, Director of the Defense Intelligence Agency, said earlier this year that "after global terrorism, the proliferation of weapons of mass destruction remains the most significant threat to our homeland, deployed forces, allies and interests."

The threat from the increasing numbers and capabilities of ballistic missiles is pronounced. This threat is highlighted by proliferation of ballistic missiles by countries such as North Korea and China, and secretive weapons proliferation networks, such as the one run by A.Q. Khan, selling nuclear technology and expertise. Not only is the threat from the numbers and capabilities of ballistic missiles increasing, but the group of countries possessing ballistic missiles includes some of the world's most threatening and least responsible regimes, such as North Korea and Iran.

As LTG Maples recently testified before the Senate Select Committee on Intelligence in unclassified session, "North Korea has an ambitious ballistic missile development program and has exported missiles and missile technology to other countries, including Iran and Pakistan. North Korea continues to develop the Taepo Dong 2, which could reach parts of the United States and is capable of carrying a nuclear payload. On 4 July 2006, North Korea conducted seven widely-publicized missile launches. The Taepo Dong 2 space launch vehicle / intercontinental ballistic missile was flight-tested for the first time and failed shortly after launch. Despite the failure of the Taepo Dong 2, North Korea successfully tested six theater ballistic missiles, demonstrating the capability to target U.S. forces and our allies in South Korea and Japan. North Korea is also developing a new intermediate-range ballistic missile and a new short-range, solid-propellant ballistic missile. Export of North Korea ballistic missiles will continue to be a concern."

Turning to the Middle East, Iran represents a dangerous nexus, combining a vigorous ballistic missile program, a nuclear program that we assess also reflects a desire to develop nuclear weapons, and a history of support for international terrorism. Terrorism has been part of Tehran's arsenal for decades. In fact, before the September 11 attacks, more Americans had been killed by Iranian-backed terrorists like Hezbollah than by any other terrorist group. Iran has made ballistic missiles an important part of its defense strategy. As former Director of National Intelligence, John Negroponte, testified last year, "The danger that it will acquire a nuclear weapon and the ability to integrate it with the ballistic missiles Iran already possesses is a reason for immediate concern. Iran already has among the largest inventory of ballistic missiles in the Middle East, and Tehran views its ballistic missiles as an integral part of its strategy to deter—and if necessary retaliate against—forces in the region, including U.S. forces."

In this environment, recent statements by Iranian President Ahmadi-Nejad threatening the United States and its friends in the region, most notably Israel, are of particular concern. In October 2005, Ahmadi-Nejad declared that "Israel should be wiped off the map. God willing, with the force of God behind it, we shall soon experience a world without the United States and Zionism." He also said that "anybody who recognizes Israel will burn in the fire of the Islamic nation's fury."

Iran also continues to develop ballistic missiles of increasing range and sophistication that may one day be able to deliver a nuclear weapon. Lt. Gen. Maples recently testified before the Senate Select Committee on Intelligence that Iran continues its efforts to develop and acquire ballistic missiles capable of striking Israel and Europe. Iran's ballistic missiles already cast a shadow over U.S. friends and allies, and our deployed forces, in the Middle East. Moreover, the Intelligence Community assesses that Iran would be able to develop an ICBM before 2015 if it chose to do so. The addition of nuclear warheads and an ICBM that could reach the U.S. would further extend Iran's ability to coerce others and threaten the U.S.

Iran has also claimed it is pursuing a space-launch capability. Although space launch vehicles can be used for peaceful purposes, if Iran were to achieve such a capability, it would also be demonstrating the key technologies needed to deliver payloads at intercontinental ranges.

OVERALL DEFENSE STRATEGY AND U.S. DEFENSE GOALS

Ballistic missile defenses remain an important part of our overall defense strategy. Last year, the Department of Defense released the 2006 Quadrennial Defense Review (QDR). The QDR recognized U.S. superiority in traditional warfare, but stressed that improvements are needed in non-traditional warfare. The QDR identified a number of priorities to operationalize the National Defense Strategy, including: 1) defending the homeland in depth; 2) shaping the choices of countries at strategic crossroads; and 3) preventing hostile states and non-state actors from acquiring or using weapons of mass destruction. Ballistic missile defenses can make important contributions to each of these priorities. They can be part of a layered defense against the use of ballistic missiles to attack the population and territory of the U.S., its deployed forces, or its friends and allies. They can also help dissuade countries from choosing to compete militarily with the U.S by increasing the cost of competition and decreasing the certainty that a ballistic missile attack will succeed.

The 2001 QDR outlined four broad defense policy goals: to assure, dissuade, deter, and if necessary, defend and defeat. Missile defenses support these goals in the following ways:

> Assure allies and friends that threats by nations armed with ballistic missiles will not be able to deter the U.S. from fulfilling its security commitments, coerce our allies, or undermine a coalition;

Dissuade potential adversaries from investing in or developing ballistic missiles by reducing the value of such weapons;

Deter ballistic missile attacks and threats by reducing an adversary's confidence in the success of an attack; and

Defeat missile attacks against the United States, its deployed forces, and its friends and allies in the event that deterrence fails.

PRESIDENTIAL DIRECTION

Upon taking office, President Bush embarked on a bold new course for strategic deterrence and defense. The President issued NSPD–23, National Policy on Ballistic Missile Defense. The President directed us to field an initial missile defense capability in 2004 consisting of ground- and sea-based interceptors, additional Patriot units, and sensors on land, at sea, and in space. The initial capability was only a starting point. Using an evolutionary acquisition approach, we are improving these capabilities over time to meet the changing threat and to take advantage of emerging technology. We must continue a robust research and development effort, in addition to fielding adequate quantities of interceptors.

As technology changes over time, so will the composition of our missile defense force. There will be no fixed, final force structure. We will change the number and locations of our missile defenses to counter emerging threats and to take advantage of geographic opportunities. Some threats, like Libya, may recede, while others, like Iran, will grow. Our missile defenses must have global reach to counter threats wherever they may appear.

The U.S. is making steady progress in meeting these goals. We now have ground-based interceptors deployed in Alaska and California; sea-based interceptors available for deployment aboard Aegis Cruisers and Destroyers; more Patriot units; sensors on land, at sea and in space; an evolving command and control system to tie it all together; and trained warfighters on station.

INTERNATIONAL MISSILE DEFENSE COOPERATION

International cooperation is one of the cornerstones of our national policy on ballistic missile defense. In 2002, the President directed that missile defense cooperation will be a feature of U.S. relations with close, longstanding allies, and an important means to build new relationships with new friends. The U.S. has made progress in carrying out this direction, with cooperative efforts underway with many countries. Today, 15 countries (including 9 in NATO alone) are engaged in missile defense efforts of some kind, whether by hosting key facilities or assets on their territory or actively discussing this possibility, pursuing R&D programs, signing cooperative agreements with the U.S., or maintaining capabilities. In addition to the U.S., the list includes Australia, the Czech Republic, Denmark, France, Germany, Italy, Israel, India, Japan, the Netherlands, Poland, Spain, Taiwan, Ukraine, and the U.K. I would point out that Russia clearly believes in the value of missile defense as it continues to maintain a missile defense system around its major population center, Moscow, and has developed defenses against shorter-range missiles.

Let me briefly describe some of these allied efforts.

- North Korean ballistic missiles pose a direct and immediate threat to Japan. This threat encouraged Japan to seek closer cooperation with the U.S. The Japanese are now one of our pre-eminent missile defense partners.
    - Japan is deploying a multi-layered system comprised of upgraded Aegis ships with Standard Missile-3 (SM–3) interceptors, Patriot Advanced Capability-3 (PAC–3) systems, new and refurbished warning radars and an upgraded command and control system.
    - Japan and the U.S. are co-developing the SM–3 Block IIA, the next-generation sea-based interceptor. This larger, more capable interceptor will enable Aegis ships to intercept longer-range missiles.
    - Japan agreed to host a U.S. forward-based X-band missile defense radar.
    - Four U.S. Aegis engagement ships are forward-deployed to Japan, along with several more missile defense surveillance and tracking ships.
    - We deployed a U.S. PAC–3 battalion to Japan last year.o We are also deepening coordination of our missile defense operations and to share missile defense information.
- We are cooperating with Israel on the Arrow System Improvement Program. The Arrow System is now deployed and protecting Israeli citizens and territory.
- Germany, Italy, and the U.S. are co-developing the Medium Extended Air Defense System, a replacement for Patriot systems in the next decade.

- We have upgraded and are testing the early warning radar at Fylingdales, U.K. this year; a second early warning radar in Thule, Greenland, is scheduled to be upgraded and tested in a few years.
- NATO is developing the Active Layered Theater Ballistic Missile Defense system, a command and control backbone for member countries' theater missile defenses. In addition, the NATO Feasibility Study released in 2005 confirmed that missile defenses to protect European citizens are, indeed, feasible.
- We have concluded agreements with the U.K., Japan, Australia, Israel, Italy, and Denmark to facilitate government-to-government and industry-to-industry missile defense cooperation. We are also holding discussions or working on technology efforts with Germany, India, the Netherlands, Spain, Ukraine, and France.

In his 2002 direction, the President specifically called for cooperation to build new relationships with other nations, like Russia. While that prospect at times seems remote, there are positive developments to report. We are continuing negotiations on a Defense Technical Cooperation Agreement with Russia to facilitate both government-to-government as well as industry-to-industry missile defense cooperation, and we continue to seek practical areas of cooperation with Russia on a bilateral basis as well as in the NATO-Russia context.

U.S. MISSILE DEFENSES IN EUROPE

In January of this year, President Bush directed us to proceed with negotiations to base U.S. long-range missile defenses in Europe. These defenses are intended to counter the increasing threat from Iranian missiles. Iranian press claims Tehran currently has a 2,000 km range ballistic missile capability, which could reach parts of Eastern Europe. While our intelligence community assesses that Iran would be able to develop an ICBM before 2015 if it chose to do so, we must start now in order to address this threat in a timely manner.

Current plans call for basing in Poland ten Ground-Based Interceptors similar to those currently deployed in Alaska and California, and a midcourse radar in the Czech Republic. An existing midcourse radar at the Reagan Test Range will be refurbished and moved to the Czech Republic. Negotiations are ongoing and, pending a successful outcome, work is planned to begin at the sites in 2008. These missile defense assets would be integrated with existing radars in Fylingdales, U.K., and Thule, Greenland, as well as the U.S. Ground-based Midcourse Defense system.

The deployment of U.S. missile defense assets in Europe has many benefits:

- They would be capable of intercepting not only intercontinental ballistic missiles but also intermediate-range ballistic missiles launched out of the Middle East. The U.S. goal is to optimize the defensive coverage of both Europe and the U.S.
- They would provide a second "layer" of defense for the U.S.
- With the protection afforded by these U.S. defensive capabilities in Europe, NATO member states could resist attempts by hostile states to intimidate or coerce the Alliance or its members from taking actions in a coalition. Strengthening our European allies and the NATO Alliance in turn enhances U.S. security.
- They would provide additional decision space for national leaders, including the President, for example, by allowing them to delay or defer resort to offensive responses to an attack.
- Missile defenses provide another avenue for burden sharing and strengthening strategic relationships with important allies. When negotiations are successfully concluded, Poland and the Czech Republic would be providing a significant contribution to the collective security of the NATO Alliance by hosting BMD assets.

I also want to comment briefly on benefits derived specifically from the basing mode we have chosen to pursue, that is ground basing interceptors in silos. Many of our missile defense systems, such as Aegis and PAC–3, are mobile or transportable. The advantage of mobility is flexibility—we can move assets into place as circumstances warrant. But there's also an advantage to ground-based silos. That advantage is persistence. If we field long-range interceptors in silos in Europe, we will have a capability that is always there—before and during a crisis. Both our allies and potential adversaries will know for certain that a basic missile defense capability is in place. These missile defense assets, then, will be able both to assure allies, and to deter and dissuade adversaries at all times once they are fielded.

CRITICISM FROM RUSSIA

While we see many benefits from a deployment in Europe, unfortunately some in Russia have expressed their opposition, contending that our limited missile defenses constitute a threat to the strategic balance. I would say first and foremost, that we do not regard Russia as a strategic adversary; hence, there is no strategic balance to disturb. These systems are not directed against Russia. Furthermore, physics and geography prove that ground-based missile defense interceptors and an X-band radar for midcourse tracking and discrimination of warheads located in central Europe would have no capability against an ICBM launched out of Russia at the United States in a one-on-one engagement. Finally, ten interceptors are simply not a threat to Russia and cannot diminish Russia's deterrent of hundreds of missiles and thousands of warheads.

Some in Russia also claim that we have not consulted with them and answered all of their questions. Yet, we have been transparent with Russia regarding our plans for and capabilities of the proposed U.S. European missile defense deployment. Senior State, Defense, and MDA officials have frequently briefed senior Russian counterparts, as well as their experts, in Washington, DC, Moscow, Brussels, and elsewhere. Russian officials understand the European-based assets would have no capability against Russian ICBMs launched at the United States, and that these assets would be optimized for engaging ballistic missile threats launched out of the Middle East.

Providing Russia transparency and predictability in our missile defense policy, plans, and programs is certainly in the interest of the United States. We will continue to keep Russia informed about the status of our programs and decisions, explore the possibility of additional confidence-building measures, and seek opportunities to cooperate on missile defense in the future.

CONSULTATIONS WITH NATO

I mentioned previously that a European interceptor site will provide long-range missile defense coverage to many NATO Allies. Missile defense has been a topic of discussion and debate at NATO for quite some time, and the U.S. plan to begin fielding missile defense elements in Europe has served to focus and intensify these discussions.

The Alliance has already taken several important steps demonstrating its support for missile defense. With its Active Layered Theater Ballistic Missile Defense Program, the Alliance has decided to develop a capability to defend its deployed forces from shorter-range missile attack. The program office, established in 2005, is headed by a Frenchman, and his deputy is an American. Recognizing that there is also a growing threat to NATO territory, the Alliance agreed at the 2002 Prague Summit to initiate a NATO Missile Defense Feasibility Study to examine the defense of Alliance territory and population centers from ballistic missile attack. This study was completed and presented to the 2006 Riga Summit. At Riga, the Alliance endorsed the Study's conclusion that defense of Alliance territory and population centers is technically feasible.

Although the Alliance has yet to make the collective decision to pursue a continental defense, a number of individual Allies have demonstrated support for long-range missile defense. For example, Poland and the Czech Republic have expressed interest in hosting long-range missile defense assets, the United Kingdom has agreed to an upgrade of the Fylingdales Early Warning Radar, and Denmark has agreed to a similar upgrade of the Early Warning Radar at Thule, Greenland.

CONCLUSION

In conclusion, we have made great progress in meeting the goals the President set over 4 years ago. Missile defenses are an essential element of our overall national security strategy to dissuade and deter nations from acquiring or using ballistic missiles and to protect our citizens from the threat of terrorist attack. As the threat of ballistic missiles and WMDs increases, more allies and friends are choosing to work with us on missile defense projects. Given these results, we will continue the current policies. Subject to your questions, this concludes my statement.

Senator BILL NELSON. As a courtesy to our colleagues, I will defer my questions.

Senator Inhofe.

Senator INHOFE. Thank you, Mr. Chairman, and Senator Sessions for allowing me to jump in a little bit earlier here.

In your opening statement, Senator Sessions, you talked about something that I was concerned about and I would kind of like to pursue that a little bit.

If you're looking at Iran, and some of the things, what they were willing to do with their hostages just a week ago, what would they do if they had the capability of some kind of a missile? I can't help but think that they've demonstrated pretty clearly that they would be willing to, if they can hold one country hostage with hostages, then what could they do if they had that capability, to an entire country? Whether it's Israel or someone else.

Now, our GMD system, you talked about, I think it was you, Mr. Green—no, it was you, Dr. McQueary—talked about it's coming along, we are doing testing right now, but didn't we have 15 out of the last 16 tests, weren't they successful on the use of that GMD system?

General OBERING. Sir, I could probably answer that better. The 15 of 16 flight tests included more than just the ground-based system. But we clearly had a good test with the GMD system last September. We've now flown the booster three times, and we had the successful intercept in September. Prior to that in 2000–2001, we had four or five successful intercepts. So, when we get this kill vehicle into the terminal box, so to speak, it does take care of the job.

Senator INHOFE. Well, I guess my thinking is this—even though—I know, we always want to have everything tested and running perfectly and all of that, but if you have something that's been—that is effective, maybe needs a little bit more testing, why wouldn't it be a good idea to place such a system someplace, so that if you had someone like—we're not dealing with normal people when we're talking about North Korea and Iran. If they knew that we had something that very likely could knock it down, wouldn't that be a deterrent to them?

General OBERING. Sir, you've hit on a key point, and it's probably one of the biggest differences in the way that we are doing business than the rest of the department. It feeds into much of the flexibility that Mr. Francis talked about.

But what we're doing is, as opposed to being risk-adverse, we are managing risk. So, what we do, is we do sufficient testing to understand that we have a warfighting capability, and we begin to deploy that and get it in the hands of the warfighter. We continue to improve, and continue to develop it over time, and continue to test it, and that's also what General Campbell was talking about in this idea of the interaction between the warfighter and the developer.

So, it's not waiting until you have every "t" crossed or every "i" dotted. You do sufficient testing to get that in the hands of the warfighter quickly, because frankly, personally speaking, I think we lost a little bit of a sense of urgency in the Department during the Cold War, in terms of getting that capability out the door to the warfighter. Especially in a mission area where we historically had no defense. I think it's critical that we get this out as quickly as we can, with sufficient testing to understand the behavior.

Senator INHOFE. I think our intelligence is good, and you guys, I know, are pretty aware of the risk that's out there. I'm looking at your MDA book here, showing what North Korea has, for exam-

ple, that they have capable right now. I've always been a believer that if North Korea has it, it wouldn't be too long before Iran would have it. So, I've been concerned about this.

Now, Mr. Green, I appreciate what you said about some places in Eastern Europe maybe being ideal for location of these defense systems, and would you all agree, generally agree with him that the Czech Republic or Poland, or someplace like that, would be a good place for this?

General OBERING. Were you asking me, Senator?

Senator INHOFE. Anybody. Mr. Green has already responded. I just wondered if, do you agree with Mr. Green?

General OBERING. We would agree with Mr. Green. As I mentioned in my opening statement, we've already worked the problem on the western side of our country—North Korea, and it makes no sense to me to leave the door open on the eastern side now, coming out of Europe. We have a threat that's in a sprint, from what I can tell, in developing short-range and medium-range missiles.

So, although our intelligence will tell us we have a certain amount of time, I think we need to move now to close that door.

Senator INHOFE. I would think that when you're looking at the missile defense budget, it's a half billion dollars below where it was in the previous year, or is right now. This concerns me, does this—do you think you can stay on track with, by reducing, effectively reducing the budget? Then, of course, you heard Mr. Francis talk about, in the years to come, it's going to be between 8 and 10, so it sounds to me like it's going to be a continual reduction. Do you think that's adequate?

General OBERING. Sir, we've certainly gone to great extents to try to make it a balanced budget, to try to——

Senator INHOFE. Yes, that's what, the hand you're dealt. Do you need a better hand?

General OBERING. Sir, we could always use more money in this regard, because I think we could—it goes back to what I said previously—we could get more capability out quickly, into the hands of the warfighter.

Senator INHOFE. Mr. Chairman, if this were a hearing on the Joint Strike Fighter or FCS, I'd say the same thing. Because, you can't take it out of systems right now, that are underfunded, and that's kind of what we are dealing with.

I have another, just, kind of unrelated thing, Mr. Chairman, I'd like just to throw out there the—on January 11, the Chinese used a modified ICBM to knock down one of their own weather satellites, and this to me, this demonstration was, I'm not sure what the motive was, but I fear the motive was to let us know their capabilities, because the same orbit that is used for a weather satellite that is owned by the Chinese, is what we would have for intelligence, for reconnaissance.

I guess my question is, if they can hit their own satellite in the same orbit, couldn't they hit ours too? No-brainer?

General OBERING. Sir, if they have demonstrated the ability to hit a satellite in low-earth orbit, than it's just a matter of targeting at that point.

Senator INHOFE. So, they could.

General OBERING. Yes, sir, I've——

Senator INHOFE. And they did.

General OBERING. As for demonstrating all of the building blocks, they've demonstrated that.

Senator INHOFE. In this particular area, we're talking about China there, you have the South China Sea, you have the Taiwan Straits. If they were to blind us in the middle of something, what's the, kind of the worst-case scenario you could think of? We'd be sitting there without any way of seeing what's going on?

General OBERING. The worst case would be if their intent was actually to take action against Taiwan, we might find that they'd have their invading force on the island before we could react.

Senator INHOFE. Yes. I know that we have other capabilities, we talked about the UAVs, and—but anything else that is currently a capability on reconnaissance is going to be easier to take out than one of the satellites in orbit, I think you'd agree with that, wouldn't you? In which case, what are we looking at to take care of that problem, now that we have seen what happened on January 11? Are we looking at new technology?

General OBERING. Sir, we in the MDA have not been assigned a mission to do counter-anti-satellite (ASAT). It is certainly true that much of the technology that we are developing is directly applicable to that, and frankly is fairly straightforward in terms of application, but we have not been given that mission.

Senator BILL NELSON. Senator, we've been trying for 2 months to have a hearing on the China ASAT test. We just haven't been able to get the witnesses when they're in town so that we could do that.

Senator INHOFE. This is something that really does concern me, because it's so obvious what they could do to knock out our ability of reconnaissance. I would hope that we are looking at technology right now, whether it's you or somebody else, and when you have this hearing, I'd like to get a little advance notice, because I'm very much concerned about it. I know there are other companies out there that are working toward suborbital reconnaissance solutions, and I'd like to pursue this to be sure they are, if they're not.

Thank you, Mr. Chairman.

Senator BILL NELSON. Senator Reed.

Senator REED. Thank you very much, Mr. Chairman.

Thank you, gentlemen.

Mr. Green, just to clarify the status of the proposed deployment in Eastern Europe—10 GBIs perhaps in Poland, and a radar in the Czech Republic—this is not a final proposal yet, in terms of the administration or the governments in Poland or the Czech Republic, it is still at the discussion stage?

Mr. GREEN. Senator, we have exchanged diplomatic notes, both governments have expressed a willingness, a desire to go into negotiations on these facilities, we are starting those negotiations and we expect to pursue those vigorously over the next several months.

Senator REED. But there's not a final agreement even at the governmental levels as far as location and responsibilities. That's still all to be negotiated?

Mr. GREEN. There are several parts of the negotiating process, one of them would be a main missile defense agreement that would define in great detail the obligations and responsibilities of both

parties, and that is what we'll be negotiating over the next several months.

Senator REED. Would those agreements have to be approved by the parliaments of the respective countries, Poland and Czech Republic?

Mr. GREEN. Those would be subject to parliamentary approval, yes, sir.

Senator REED. Were they subject to approval by the United States Congress?

Mr. GREEN. We treat those as executive agreements, so we would not, they're not considered to be treaties, so they wouldn't be submitted to the Senate.

Senator REED. So, they would be submitted to the Polish Congress, and the Czech Congress, but not the United States Congress?

Mr. GREEN. That's correct.

Senator REED. There is a possibility, of course, that even as the negotiations take place that the Polish and Czech Congress could reject them. That's a possibility?

Mr. GREEN. There's always that possibility, Senator. Obviously, we have entered into these negotiations with a very high expectation of success, and the governments of both Poland and the Czech Republic have also entered them in that expectation.

Senator REED. I guess one of the advantages, perhaps, since they're parliamentary governments, that the majority party and the Prime Minister are very closely aligned, that might be one difference, Mr. Green.

Mr. GREEN. I would never speak ill of our form of government.

Senator REED. No, I know. [Laughter.]

Having had your hand in it. [Laughter.]

General Obering, two DOD boards were established in 2002 to provide oversight over MDA, the Senior Executive Committee and the Missile Defense Support Group. Reportedly, they have not met for several years, is that correct?

General OBERING. Sir, they were very active when we first stood up the MDA in 2002. They had, I think, eight meetings the first year, if I'm not mistaken, and things got off to a pretty good bang. What we did is we altered that, and we went to a direct oversight with the Under Secretary of Defense for Acquisition, Technology, and Logistics. The Missile Defense Support Group and the Senior Executive Committee have now been replaced with the Ballistic Missile Executive Board, and that reconstitutes that oversight. It will have standing subcommittees that report to that, and that charter was just signed here, recently, and we will kick that off with the first meeting of that, I think, in the next 3 weeks or so.

Senator REED. So, the BMDS Executive Board is just beginning now? It hasn't really started, but it will?

General OBERING. Yes, sir.

Senator REED. So, essentially, what outside entities beyond MDA have been looking over your shoulder, and giving you advice?

General OBERING. Sir, you name it. We've had quite a few.

Senator REED. Who do you have to listen to?

General OBERING. First of all, we have quarterly execution reviews with my boss, directly, the equivalent of a Defense Acquisi-

tion Board, where we go through all of the programs, we go through the performance. We also report, I go to the Joint Requirements Oversight Council, I brief up what the incremental improvements, the changes in our baseline—we do report changes in our baseline, by the way, to the Office of the Secretary of Defense (OSD) and to Congress through the SAR activities, and we've done that now for the past several years.

We have been audited, of course, by the GAO, very robustly, and now there's a standing—I think it's an annual mandate that they have to come in and look at all of our programs——

Senator REED. What about the Program Analysis and Evaluation (PA&E)?

General OBERING. PA&E were part of the Missile Defense Support Group that lasted for a year or so, about 18 months, and then they are now part of the standing committee that will be part of the Executive Board.

Senator REED. Let me change subjects slightly, and that is, according to the budget data, the GBIs 21 through 30 were incrementally funded over 3 years. Interceptors 31 to 40 were incrementally funded over 4 years, and then the GBIs 41 to 50 were incrementally funded over 5 years. Why are we increasing the incremental funding for these interceptors?

General OBERING. Sir, what we do, and Mr. Francis referred to it—is we try to adjust the scope of our activities based on the realities of what we're faced with. So, in that timeframe that you just talked about, we have adjusted to some of the realities of the program. If you recall, there was a chemical systems division explosion at our plant in San Jose, California, that took out one of our entire configurations of our GBI boosters, that we had to not only recover in terms of finding additional vendors and suppliers for that, but recover those boosters' interceptors.

When we had the two aborts that occurred in December 2004 and February 2005, as you also probably recall, I stood up an Independent Review Team to take a look to make sure that those were just technical glitches, that they were not systemic problems, et cetera, and we stopped deployment, at that time, of the interceptors.

I also made a decision in the 2003–2004 timeframe that we would fund the logistic support costs for these interceptors, along with the other things that we produce. The reason is I thought it was a proper behavior to generate on the part of developers, that they need to pay attention to support costs, and if that came out of our budget, it came out of those programs, they would have to take that into account. We've also done some other things with respect to concurrent test and operations, et cetera. So, we added scope in some areas, and we had to stretch out scope in other areas to be able to accommodate those changes.

It's part of a flexible portfolio management approach that the GAO recommends, and I think some of the things we are going to talk with the GAO about are the recommendations that are coming out of that particular report, and how they relate to some of the recommendations that they have in our report.

Senator REED. Thank you, sir.

Mr. Francis, right now the entire BMD System is considered a single major defense acquisition program. Can you give us your views on reporting on this very, very large program? Benefits? Advantages? Would it be better if there were some type of dis-aggregation or some type of more focused approach?

Mr. FRANCIS. Sure, Senator. We think the advantage of managing a system of systems is, it does provide a portfolio, which General Obering then can make decisions across program lines, so that you don't have each program stove-piped. So, he can make decisions to move money to places where they're needed. He could also, if he wanted to, meet a threat, he could move requirements around to the system best able to do that. That's the real advantage of a portfolio like that.

The disadvantage comes from an oversight perspective, because typically the elements within MDA would be individual programs that you would have oversight over and be budgeting for and reconciling costs with. In a system of systems, you lose that granularity, because you don't necessarily see what's going on in each system. So that part's difficult; it's true, for any system of systems.

So, it's something—if that's where we're going to go in the future, we need to think about oversight mechanisms that give us visibility to the elements while providing the flexibility to make trades at the system level.

Senator REED. From the GAO's perspective, do you feel comfortable that you have sufficient access and granularity? Details?

Mr. FRANCIS. Yes, I think we have sufficient access. We do have difficulty, if you will, chasing some of the numbers. You brought the example up of the incremental funding—that's something that is made possible by the whole budget being R&D funds, so that you can pay for something over time. In another program, you would require procurement funding, so if you were going to buy 10 interceptors, for example, all 10 would have to be funded in a budget, and then you would track those costs.

So, what becomes difficult for the accountant, if you will, is when costs are tracked over 5 years, you kind of lose the audit trail, and then to try to compare actual costs back with what was budgeted, we can't go back and reconcile, "Okay, we were going to pay this much for 10 interceptors, we paid this much more—why did that happen, and what's the Government's recourse?"

Senator REED. Thank you, and for the record, "granularity." I think. [Laughter.]

Dr. McQueary, and General Obering, one of the issues that is perennial is very realistic operational testing. Where do you think we are in terms of that, particularly with the GMD system?

Dr. McQueary?

Dr. MCQUEARY. As I indicated in my opening remarks, we would say that based upon the test that was conducted—I don't have all of the numbers properly—but the test that was conducted with the interceptor, they have demonstrated a capability to intercept a simple foreign threat. So, that does not imply that we're finished, or anything at all. But that demonstration has been done.

Senator REED. So, we're still somewhat removed from engaging what likely would be shot at us by a hostile——?

General OBERING. No, sir, I don't agree.

Senator REED. Okay.

General OBERING. There's nothing that says that we might not be faced with simple threats in the near-term, against the rogue nations that we are gearing this system torward. We have planned this year to add more and more capability into these tests with respect to sensors, like the SBX Radar, the forward-based deployed radar, as well, to begin to run some of our capabilities to begin to address more complex threats, as well. So, we have a path that we have laid out ahead. Sometimes we hear, "Well, if it can't handle very complex countermeasures, it's not worth deploying," and frankly, we don't agree with that. We think that there are many situations where we will not be faced with complex countermeasures, and it is worth deploying.

Senator REED. So, if you were deploying a fighter aircraft, you'd feel very comfortable deploying it against the least capable threat in the air, saying that it's operational and it's good enough?

General OBERING. If it was the most likely threat, sir. If you had no defense against that threat, then I think I would be inclined to do so.

Senator REED. What's your premise of the most likely threat? I don't want to belabor this, but one of the issues here is, it's a race. To develop the very sophisticated anti-missile system that you're trying to do, versus deploying things like balloons, and decoys, et cetera. There are some that would argue that it's a lot easier to deploy decoys or things like that, than it is to knock one of those things down, kinetically.

General OBERING. Well, fortunately, because we have had the support of Congress, we've been able to get a large step up in that race, so to speak. With the fielding of the SBX Radar, with the advanced radar algorithms that will be placed in that, this year, along with the forward-deployed radar, we have a tremendous leg up.

By the way, countermeasures are not as easy as they are being described, sometimes. We have probably the Nation's leading countermeasure experts in the MDA, or under contract to us. We actually flight test these. We flight test them in front of these radars, we understand the characteristics and we understand the behavior so that we can program those into the radar, so, we're trying to keep up with that very threat.

Senator REED. I understand that, sir.

Thank you.

Senator BILL NELSON. Senator Sessions?

Senator SESSIONS. General Obering, let's just discuss that a little bit more. Based on what we understand, for example, on the launches that the North Koreans attempted, what can you tell us about your expectation of their ability to have complex countermeasures or decoys? Is that classified?

General OBERING. Yes, sir. It would be classified. Suffice it to say that I believe that my statements stand that we would have a capability against those threats.

Senator SESSIONS. But there's no difficulty, and in fact, it's part of your strategy that while these systems are in place now that are capable of defending against, as Dr. McQueary said, a simple mis-

sile launch, that you will continue to make them more sophisticated through R&D.

General OBERING. Yes, sir, as well as fielding. We actually have a program, in addition—as I said—to the deployment of these algorithms in the radars, we have a program called MKV that will allow each one of our interceptors to be able to handle what we call "credible objects"—more than one. So that means that we don't have to be precise to understand what is the warhead, and what's not. We can actually take out everything that's in that particular cluster of a threat sweep.

Senator SESSIONS. That assumes that the attacking missile has multiple decoys.

General OBERING. Yes, sir. Yes sir, exactly.

Senator SESSIONS. But even in that system, I assume you've attempted to design it to make sure it does not go after the decoys, but hopefully will go for the——?

General OBERING. Yes, sir. We actually go through a staged process, a layered process, just like everything else, to try to make sure we focus as much as we can on the warheads.

Senator SESSIONS. How do you see the status of the MKV program? How's that funding, and do we have problems there?

General OBERING. If there was any program that I have that I would like to accelerate, it would be that one. In terms of being able to move that back to the left. That would require additional money, additional funds.

Senator SESSIONS. As I was listening, "move to the left"—what does that mean? That makes me nervous. [Laughter.]

General OBERING. Sir, not politically, but scheduling.

Senator SESSIONS. Good.

So, Dr. McQueary, you talked about that the test program being robust and disciplined, I believe, and that it has limited capability against a simple threat—which I think gives us some confidence. General Obering, you used a phrase in your opening remarks that a good missile defense system would "devalue" the assets of the enemy—what do you mean by that?

General OBERING. Sir, if you'll bear with me one second, I view missile defense as part of a spectrum that includes deterrence, arms control, and missile defense as well. At one end you have enemies—countries that can be deterred, and we've seen that in our history and it's worked very well. You have other nations against whom you can use arms control measures, both positive and negative sanctions or incentives, to try to get their behavior modified.

But, I think that as we enter this century and we get into it, we understand that we're in a world in which we may face organizations, countries, what I call the nation-state equivalent of suicide bombers, that are not deterrable and are not affected by arms control.

So, it would be nice to have another option that we can provide to the President and the American people to protect them. So, as we roll out missile defense capabilities and as they become more widely known as being effective, then it begins to take away the value of these missiles from countries like Iran and North Korea. Because historically we've had no deployed defense against them—they view that as a great equalizer with the United States or with

the West, as being put on an even par with us, and therefore they can leverage that against our allies and our friends. So, if we say, "If you deploy those weapons or try to use them, they're not going to be any good, because we will shoot them down," then they have to go through the investment decisions, do they want to do that, do they want to continue to invest in these weapons? We think that if we are able to show an effective missile defense, collectively, along with our allies, it begins to devalue those weapons in the eyes of some of these countries.

Senator SESSIONS. I think that's a good explanation and I think maybe other nations that might be thinking on developing an offensive missile system would, might add the cost up thinking that we—even if they completed and spent hundreds of millions, maybe billions of dollars on that, it still wouldn't be effective because we have a good system against it.

General OBERING. Yes, sir.

Senator SESSIONS. Would that be true also?

General OBERING. Yes, sir.

Senator SESSIONS. General Obering, you've been given, as Mr. Francis said and as GAO's report discusses, flexibility to both deploy and develop at the same time.

He raised some points about some cost overruns or spending above what we've projected. Tell me, in your view, how you would evaluate this? First of all, there is value to the United States that we have this system in place today.

General OBERING. Yes, sir.

Senator SESSIONS. A very great value. But, in terms of the actual cost of this program, we've gone faster, sometimes faster saves money. Tell me how you would evaluate, honestly, for this Congress and the American people who may listen, whether or not this flexibility you've been given and the more rapid deployment than a lot of systems would allow, has impacted the actual cost of the program.

General OBERING. Well Senator, as I said in my opening statement, we've come a long way in 30 months since 2004 with the flexibility that we've been given. We've been able to rapidly develop and field and deploy these capabilities.

If we look aggregately at what we have done from a block-cost perspective, we are roughly 4 percent or less for Block 2004 or Block 2006, in terms of what we anticipated the cost of the block to be. As Mr. Francis referred to, in some cases we had to defer content, and I'll give you a couple of examples, but then we catch back up.

So for example, as a result of the activities in the 2004–2005 timeframe, we lost six of the GBIs in the explosion that I talked about in California. I also redirected four GBIs as a result of the launch aborts back in December 2004 or February 2005 as well, into our ground test program, that were going to go in to be deployable.

We have now been able to catch back up to where—way back in 2002, we had anticipated that we would have 30 GBIs in the silo by the end of this year. We will now have 24, as opposed to the 30, and those are the 6 that we lost in the explosion. We should be able to catch back up with the original target for Block 2008,

based on the funding profile that we've been given and how we're managing the program.

Again, a lot of the flexibility we've been given also allows us to do things like the savings that we took from the GMD program. We discovered that we had some overhead infrastructure that we no longer needed in the program. We were able to reduce that and turn that money into GBIs to help us catch that up again.

Senator SESSIONS. To follow up, even if we had the traditional procurement system, even, that I think Mr. Francis will agree, when we've had that, we've had cost overruns, sometimes far more than this. So, I don't know that because there's some cost overrun, indicates that the program, this new technique is less effective in managing the money. I see some potential, as you've indicated, that it's allowed us to deploy much sooner, and even save some money, and delay costs money. The longer these programs stretch out and all this money that goes in sustaining it and maintaining it before you even get the system there, to me is a cost that's often not properly counted.

Is that fair to say Mr. Francis?

Mr. FRANCIS. I think so, Senator. I guess what I would bring up is, right now I think Block 2006, by our calculations, is about $1 billion over what it was expected. We've reported another $478 million in 2006 contract overruns that may defer additional work.

Now, I haven't done the calculation on the percents, but even if it were 4 percent, when we talk about regular weapons systems and we say, "Gee, they're 30, 40 percent over cost." That's generally over the life of the program, a 10-year program. So, 4 percent annually sounds like a small amount, but if we're going to do it for 10 years, it's a big number when you get out there.

The question I would ask is, is there a way to get the best of both systems? In other words, can we preserve the flexibility and not change how General Obering makes decisions, but provide more visibility on the cost consequences of the decisions he does make?

Senator SESSIONS. Presumably, you think the answer is yes?

Mr. FRANCIS. I think so, yes.

General OBERING. Yes, sir——

Senator SESSIONS. Briefly, as my time——

General OBERING. Yes, sir——

Senator SESSIONS. Briefly, if you want to respond.

General OBERING. Just that the numbers that Mr. Francis quoted, they are over more than just a 1-year period. They're longer than that, with respect to that.

If you look at the individual program performance, we're doing very well. For most of our programs we're down, below 10 percent for the total contract value of 8- to 10-year contracts with these programs. The only one that we have exception with the GAO on is our STSS. We have a factual disagreement on some assumptions that were made by the GAO, and that's okay. I think we're going to work through that. That's not a big issue. When you take that out of the equation, we're down below 10 percent for our program performance for the life of the contracts, including the GMD program. It would be running around 12 percent as part of that average.

So, I think this program, and I think GAO—I don't want to put words in their mouth, but I think they see the value in this in some of their other recommendations on how they do portfolio management. Now, what we have to do is take a real-life portfolio management example that we have had now for the past several years, compare that to what the GAO is recommending for the future of the Department, and see if there's a marriage that we can make there that would make sense.

Senator SESSIONS. Thank you.

Mr. Chairman?

Senator BILL NELSON. Mr. Francis, your report recommends a number of changes in the acquisition approach, including the use of procurement funds for buying operational assets. Would you discuss how you would recommend such changes be implemented?

Mr. FRANCIS. Yes, Mr. Chairman. We think that right now, the way the budget is requested is through elements but the way we account in MDA is through blocks. So, we think the starting point would be by program element. You would baseline an element using a knowledge-based approach—which I could discuss, but then having laid out that element that way—and by the way, this is how that report that we have on portfolios deals with that. When you're managing a system of systems, you do know the total cost of every system in there, and it does have a business case.

So, we think the elements need to be baselined for cost, schedule, and performance. Then those that are considered far enough along to be in system development and demonstration, you would then track those costs, just like you would a regular program. You would use procurement funding for those assets that are going to be operational assets. I think we would expand that to operations and support as well.

That does a couple of things for you. One is, it does give you control over the procurement funding and you can then fully fund your assets in 1 year, which provides visibility to you. It does provide some better contracting opportunities for the Government because R&D contracts are, by definition, best effort contracts where the Government does bear a fair amount of the risk.

We also think that you could—and the way we wrote our recommendation was that—to have DOD propose a way to do this. Because one of the downsides is, if you did put those elements into system development and demonstration, and baseline them, and subject them to the laws that apply to other systems if you have a cost increase that breaches a certain threshold, then DOD has to come back and certify to you that things are okay before they can proceed, which could slow decisionmaking.

So, some of the things that we're thinking about is, you could have those triggers in place to say, "Hey, we have a cost increase." But, the requirement might only be that MDA inform Congress, rather than have to stop and recertify.

Senator BILL NELSON. Would you work with our staff to try to implement those changes?

Mr. FRANCIS. Yes, sir.

Senator BILL NELSON. General Obering, in your prepared testimony, you place emphasis on proceeding with the proposed deployment in Europe of 10 GBIs and associated radars. That proposal

is one of two options included in the budget request submitted to Congress.

The budget request seeks funds to install 10 Interceptors at a third missile site—either at Fort Greely, Alaska, or in Europe. The budget request overview states that the U.S. is entering into more detailed discussions with Poland and the Czech Republic in 2007 regarding the possible basing of missile defenses in their countries.

So, as I understand it, your budget request to us is that there are two options for the planned deployment of 10 additional Interceptors—one at Fort Greely and one in Europe. Is that correct?

General OBERING. Sir, what that was meant to do was to try to address this idea of risk management and timing. That is, if Congress were to appropriate money for us to buy the GBIs, as part of this package, the long-lead items, the initial items that we need for that. If there were to be hiccups or stumbling blocks in the ongoing negotiations and in the movement for the third site, that would not be wasted money. We could use those GBIs in the Fort Greely situation.

But, it does not provide additional coverage, if we were to do that, for all the reasons we stated before to our European allies or our deployed forces in Europe, nor does it provide redundant coverage of the United States because we would have to put them back in Fort Greely, Alaska.

Senator BILL NELSON. Your proposal is you want them in Europe?

General OBERING. Yes, sir.

Senator BILL NELSON. Then why would you propose to put them in Fort Greely?

General OBERING. I think we were answering a concern if we were to receive the long-lead money for these GBIs and things did not work out with the European site, would that be money that we could not use.

Senator BILL NELSON. Is it correct that no final decisions have been made with regard to the possible basing of missile defenses in Europe?

General OBERING. I think that Mr. Green mentioned that earlier, Senator. We haven't got a final agreement, per se, but we are well on a track to reach an agreement, I believe with both the Poles and the Czechs.

Senator BILL NELSON. Okay, so if there is no decision by those governments, or an agreement is not reached to deploy the 10 GBIs in Europe, then you have the preplanned option of deploying them at Fort Greely. Is that correct?

General OBERING. We would then divert those, if need be.

Senator BILL NELSON. So, the answer to that is yes.

General OBERING. Yes, sir.

Mr. GREEN. Again, Senator, we entered into these negotiations with a very high expectation of success, as did the Government of Poland and the Government of the Czech Republic.

Senator BILL NELSON. Do you have an indication, Mr. Green, that you have the approval of NATO?

Mr. GREEN. Well, approval is an interesting word. The first point I would make is that we are going into this activity with a very,

very strong NATO context. It's a programmatic context, a NATO technical and operational context, and a political context.

There are a number of NATO nations that are currently engaged in missile defense activities. Five NATO nations, including the United States, are engaged in long-range missile defense activities. A number of others are heavily engaged in the development and deployment of short-range and medium-range missile defenses.

In terms of the technical operational aspects of this, the activity that we're involved in now, the potential deployment of long-range missile defenses in Europe will defend against a long- or intermediate-range threat to our European allies. That leaves the southern tier of Europe, so to speak, which is not subject to that long-range missile threat, but is subject to a short- and medium-range threat. They will need defenses of that sort and that's the kind of defense that European nations are working on.

There's a natural complementarity between what we're doing and what NATO is doing. I mean, we would certainly expect as NATO fills out those short- and medium-range defenses that would be compatible with, complementary to—our long-range defenses.

Senator BILL NELSON. Is it——

Mr. GREEN. In terms of political interaction we have also pursued very robust consultations with NATO and we are continuing to do that. We've consulted with them multiple times. We're going over again next week. We've had multiple trips over to the Capitals to consult in a bilateral sense and we're continuing that effort.

Senator BILL NELSON. Is it the administration's position that you would proceed on this if you got Poland's and the Czech Republic's approval, but not NATO's approval?

Mr. GREEN. We are pursuing bilateral negotiations with the Czech Government and the Polish Government. We certainly recognize the value of NATO in this context and we're continuing to work with NATO, but it is a bilateral negotiation between the Czech Government and the U.S., and the Polish Government and the United States.

Senator BILL NELSON. So, the answer is yes. You would proceed if you got the country's agreements, but not NATO's agreement.

Mr. GREEN. Again, there is, there are, I guess nuances here of approval and agreement. There is no legal requirement for approval by NATO, but we're obviously very interested in making sure that NATO allies understand the benefits of this system, how it operates, what it does, how it benefits the NATO Alliance, and I think, increasingly, we're getting an understanding from NATO nations about the nature of the threat that's posed and how this system would help defend against those threats, and increasing acceptance that this system is designed against those threats and will be effective.

Senator BILL NELSON. I'm just trying to find out, do you intend to seek NATO's approval or not?

Mr. GREEN. If by approval, you mean turning this into a NATO-funded effort——

[Disruption in the audience.]

Senator BILL NELSON. The committee will, and I'm——

Ma'am, I'm the one that got you a seat. [Laughter.]

Mr. GREEN. Senator, I honestly am trying to answer your question.

If by approval you mean turning this into a NATO-funded effort, a NATO effort to develop and deploy long-range missile defenses, that is not our intent. We have developed the system and we're entering into those bilateral negotiations with the Czechs and the Poles.

But again at the same time, I would emphasize that this is a very strong NATO context, and we are certainly very interested in trying to make sure that all of our allies are accepting and approving, though not through a formal approval process. Most NATO capabilities are not developed by NATO. Almost all NATO capabilities are developed by individual nations or groups of nations within NATO.

Senator BILL NELSON. Mr. Green, what would happen if you got the approval of one of those countries, but not both?

Mr. GREEN. Well again, we certainly anticipate the approval by both. We have not speculated about what would happen if we got approval from one and not from the other and we don't anticipate that circumstance to arise.

Senator BILL NELSON. General Obering, let's talk about the missile—or to be technically correct—the rocket that you want to put in Europe. It's a two-stage variant of the three-stage GBI, which is the one that's in Alaska and California. Are you in the process of developing this new rocket?

General OBERING. Yes, sir. It's not a new rocket, Senator, it's a different configuration of what we currently have. It allows us to maximize what we call the battle-space there, in terms of being able to get into a kill vehicle mode quickly. That's the advantage of it. It is not a significant change in terms of the things that you have to do to make that work. We have actually used this technique in other programs within the BMDS.

Senator BILL NELSON. There are different things that you have to do.

General OBERING. Yes, sir, there are. We have that on contract.

Senator BILL NELSON. Repackaging the booster avionics?

General OBERING. Yes, sir.

Senator BILL NELSON. The shrouding venting has to be modified?

General OBERING. Yes, sir.

Senator BILL NELSON. The guidance and control software has to be updated?

General OBERING. Right.

Senator BILL NELSON. You're going to operate in a new flight environment?

General OBERING. That will be tested. Yes, sir.

Senator BILL NELSON. You have to upgrade to provide nuclear hardening?

General OBERING. That is something that we're going to do. In fact, that is something that we're doing overall for the fleet.

Senator BILL NELSON. You have to improve ability to execute the full fly-out maneuvers?

General OBERING. Yes, sir. Actually, we already have those programs in the three-stage maneuver, the three-stage version as well. We have those capabilities.

Senator BILL NELSON. Do you have a schedule acceleration?

General OBERING. I don't know what you mean by a schedule acceleration, but it is part of what we have put on contract.

Senator BILL NELSON. Now, isn't that part of developing a new system?

General OBERING. Again sir, it's part of what we consider to be a different configuration of what we have. So, there are new capabilities, but we are always looking at and developing new techniques for these interceptors. Frankly, that's one reason why we prefer the R&D test and evaluation money, that allows us that flexibility to be able to do that.

Senator BILL NELSON. Do you plan to test it?

General OBERING. Yes, sir, in 2010.

Senator BILL NELSON. So, you want us to authorize and appropriate funds to deploy this interceptor that would be tested in the future, as it's not yet been put together in the development package.

General OBERING. It goes back to what I've said previously. We are managing risk, we're not trying to avoid it. We don't consider what you described to be very high-risk items based on what we know now of the GBI, the booster, the fly-outs. We believe that the longer items that are going to have to take place are the site preparation, the site clearing, the construction activities etc. So, we are pursuing those concurrently and in parallel.

Senator BILL NELSON. Let's go back to my earlier question. Suppose you decided you were not going to deploy them in Europe, these 10 GBIs, you were going to deploy them at Fort Greely. Would you deploy more of the three-stage GBIs, or would you use the newly developed two-stage GBI?

General OBERING. It depends on what we would like to do at that time with respect to Fort Greely and what capability the warfighters may want to have. So, I would defer that decision until that time, until we can think through that. But clearly, we could add the third-stage back like we have with the ones that we currently have in the ground in Alaska and California.

Senator BILL NELSON. Dr. McQueary, you're the man who is the Director of Operational Test and Evaluation. Would you have high confidence that a missile, such has been described—that is, as General Obering has said, is being developed and not been tested—would perform as operationally effective, reliable?

Dr. MCQUEARY. I think this is an area in which the DOT&E organization needs to have further discussion with General Obering. I will react in the following way though—he is taking an approach that I believe is a lower risk approach, by using proven components in order to be able to build this new rocket. So, that gets the technology readiness issue, which I think is very important.

But, I do think we need further discussions on what kind of testing needs to be done in order to satisfy us from an independent operational test evaluation standpoint, what would need to be done with that.

Senator BILL NELSON. Well, you have to advise us——

Dr. MCQUEARY. Yes, sir.

Senator BILL NELSON. —because we're in the——

Dr. MCQUEARY. I agree.

Senator BILL NELSON. —position of, the question is, do we authorize this, and do we fund it?

Dr. MCQUEARY. Well, I think the issue is, it's, with the funding approach that MDA has, and I'm in an area in which I'm not the expert, so please bear with me. By using R&D funds, such as has been done, that this approach is not inconsistent with what has been done in other areas.

Senator BILL NELSON. So, when are you going to have an answer to that question?

Dr. MCQUEARY. Well, this is a relatively new program. We are aware what the plans are and I have people in our organization who have had discussions with MDA. But I can't offer an answer to your question directly. I'll certainly be happy to provide you an answer, if I may, for the record.

[The information referred to follows:]

There are added risks anytime a system's working design is changed. In the case of the two-stage variant of the ground-based interceptor (GBI), I agree with the Missile Defense Agency's (MDA) seven developmental risk areas. I believe the most significant risk is with the software changes and integration that MDA must make not only in the interceptor, but also in the Command and Launch Equipment and the Ground-Based Midcourse Defense Fire Control to optimize the interceptor's new performance envelope. There is commonality between the two-stage and three-stage variants of the GBI booster. MDA gained experience when it converted a three-stage Minuteman II into a two-stage Minuteman II. However, I cannot make an assessment on effectiveness, reliability, or suitability on a two-stage design that has not yet been built or tested. Through MDA's Integrated Master Test Plan, I will approve the combined developmental/operational flight testing of the two-stage interceptor, and my office and the joint operational test team will participate in all aspects of this testing.

Senator BILL NELSON. Will that come soon? Because we're talking about a markup in a few weeks.

Dr. MCQUEARY. I don't know whether we can do—we certainly will not have the data with which to be able to say whether we think the new system will be effective and suitable because the data would simply not be there.

We can advise you as to whether we think the approach that the MDA is proposing to take, or is taking would likely result in a satisfactory solution if it is properly implemented. We could certainly do that.

Senator BILL NELSON. Can you provide that in a few weeks, before the markup?

Dr. MCQUEARY. Yes sir, we can do that.

Senator BILL NELSON. Okay.

Senator Thune, I still have some more, and I see you are back here. So, go ahead and ask your questions and then I'll finish up.

Senator THUNE. Okay. Well, thank you, Mr. Chairman.

Gentlemen, thank you for appearing before the subcommittee today.

Missile defense is an issue of increasing importance for our strategic requirements. North Korean and Iranian missile programs are clear evidence of both the advancement and proliferation of missile technology. Furthermore, increases in Russian and Chinese military capabilities are also a matter of concern. China's successful ASAT test and Russia's boast to overwhelm our defenses are indicators that we should not take lightly. I believe we must be com-

mitted to missile defense to ensure that our security and the security of our allies is not taken for granted.

General Obering, I want to ask you a question about the Airborne Laser (ABL) program. It's, in my view, critical to our ability to shoot down enemy ballistic missiles during the boost phase. The capability to overcome missile defense countermeasures like multiple decoy warheads is one of the many reasons that I believe the importance of the ABL cannot be overstated. I guess the question I have is, could you describe what testing is ongoing for the ABL and what are the prospects of this system for the future?

General OBERING. Yes, sir. I'd be happy to. First of all, I would like to recycle back about 2½ years, very briefly. The ABL, we believe, got on the right path in December 2004 when they were able to demonstrate that they could fire that high-energy laser in a 747 mock-up at Edwards Air Force Base. They were able to achieve the synchronization and we actually fired that laser over 70 times since that initial firing in November 2004.

We also flew the heavily modified 747 in December 2004. We demonstrated, first of all, the airworthiness of the aircraft, and we demonstrated the initial checkout of the optical train with respect to jitter control and that type of thing onboard the aircraft.

Since that time we've made significant progress. In fact, there are actually three lasers that go on the aircraft. There is a tracking laser that we use to precisely track an enemy missile. There's an atmospheric compensation laser that then goes out and measures the distortion in the atmosphere, and feeds that information back to the fire control system. Then there's the high-energy laser that actually shoots down the boosting missile.

As we sit here today, we have the tracking laser and the atmospheric compensation laser loaded on the aircraft and we have a surrogate of the high-energy laser on there. We went into flight testing several weeks ago and, in fact, we will be going back up tonight. We attempted to do a full-blown test of the tracking and the beam illumination laser last night. We will try again tonight. We ran into problems that had nothing to do with the aircraft. It was just a range availability kind of thing. So I'm very pleased with the progress that they've been making so far.

We have some key knowledge points coming up. We do use knowledge points in all of our development programs, and the ABL has to demonstrate that it can actually track a target, it can actually close a fire control solution, it has to be able to compensate for the atmosphere by firing that beam illumination laser and then compensating with the surrogate high-energy laser, all against a flying target, which is what we're doing right now. So, we should gain some significant knowledge in the next several weeks with that program.

Senator THUNE. With those knowledge points coming in and the scheduled shoot-down for 2009, why has the MDA removed over the past 3 years $1.1 billion in funding from the program, if it shows as much promise as you suggest today?

General OBERING. First of all, we are constantly being aware of what money we need when, to do what. That is the best way I can describe it. When the ABL—even though they have made steady progress, it has taken longer than we anticipated in some cases—

and there were things planned that we could defer or move out. We did that to take advantage—it gets back to the tradeoffs that Mr. Francis talked about, what we are eligible to do. Also, we had to get under some of our budget reductions overall for the entire program.

We've taken significant budget reductions going back to the President's budget of 2004, where what we had planned to do, in terms of our work, was not what we were funded to do. We had to go back and readjust that work. So, that's part of that calculation.

Senator THUNE. In the layered missile defense scheme, besides the ABL, are there any other stand-alone platforms that don't need to rely on satellites for tracking enemy missiles?

General OBERING. Well sir, it depends on what kind of defended area you're talking about, and, it depends on what the situation is. But, for example, the Aegis weapon system can detect and track and engage threat missiles. We do the same thing—the ABL has that autonomous capability, and THAAD does, as well, for that matter. What we like to do though, is while we can rely on that if we have to, we like to be able to extend that capability. So, by being able to cue the ABL from an off-board sensor, satellite, or a ground-based radar for that matter, depending on the scenario, we can greatly expand its capabilities. The same thing is true with THAAD, with Aegis, and with all of our capabilities, including the GMD program.

Senator THUNE. I share a concern that's echoed I guess, by some of my colleagues, concerning funding levels for missile defense. I guess a follow-up question is: if we continue or reduce funding for missile defense, are we going to push these advancements further out into the future, and are we creating a gap in our defenses because we are starving missile defense?

General OBERING. If we continue to push the options for the future, and ABL is included in that category, along with KEI and others, then as I said in the opening statement, it makes us susceptible to the future in terms of what the threats may be, and what we may be faced with.

To give you an analogy, if we had been overly focused on near-term capabilities back in the mid-1990s, and we had only looked at what we could push out the door in the next several years, we probably would only have, by the turn of the decade, we would probably only have Patriot, maybe some THAAD capability, and maybe some sea-based interceptor capability, but probably not necessarily the SM–3. We would have had no system to turn on last summer when the North Koreans executed those missile launches.

So, we always have to keep in mind this balance between what we are doing today, and getting out the door, and what we need to be paying attention to for the future.

Senator THUNE. Thank you, I appreciate your answers. Actually, Mr. Chairman, I do have one question I'd like to submit for the record.

Senator BILL NELSON. Okay.

Senator THUNE. If that's okay.

Senator BILL NELSON. Certainly.

Senator THUNE. Thanks.

Senator BILL NELSON. You mentioned ABL. It's currently projected to cost $5 billion for the R&D through fiscal year 2009. Last year, there were additional delays, and the planned shoot-down flight test was delayed from 2008 to 2009.

If the technology does seem to work or prove to work, could this be an unaffordable system?

General OBERING. Part of our knowledge points are to include affordability information, Senator. While we did have some delays in the program over the past year, based on some of the hard technical issues they're challenging—and they're tackling those challenges—we did slip the program about 6 months, it was December 2008 to about mid-2009 right now. When we come to our shoot-down in 2009, we look at all of the factors that go into that, and affordability is certainly one of those.

Senator BILL NELSON. So, the question of affordability would be held out there in the future?

General OBERING. Yes, sir.

Senator BILL NELSON. On deploying such a system as that?

General OBERING. Yes, sir.

Senator BILL NELSON. Dr. McQueary's testimony indicates that your MDA is acting on all of their recommendations. It also indicates that there are 15 new DOT&E recommendations under consideration.

Do you know of any reason why you would not act on all of those 15 recommendations?

General OBERING. Senator, the short answer to that is no, I don't see any reason why not. In terms of working together with Dr. McQueary, we've been establishing a strong partnership already in that regard. It doesn't mean that we agree all the time, it does mean that we are breaking new ground here with respect to how we move forward, and not think in that vein. I'd be very positive in that regard.

Senator BILL NELSON. Dr. McQueary, the THAAD flight test program was reduced by three flight tests for budgetary reasons. Now, the program is apparently going to try to accomplish all of the objectives of those three tests by adding them to other tests, and add a number of critical factors, issues, for each of those tests. Then it increases for each test. Do you believe that removing those tests adds risk to the program? Or, does it reduce the risk if those three tests should be conducted?

Dr. MCQUEARY. That's a very complex question, but let me try to keep my answer as simple as I can.

We have examined the test program for THAAD in detail, and of course they had a successful—or what appears to be—a successful test last week, making it five out of five tests conducted most recently. It is our view that the testing program as laid out, with the reduction in the missiles, is adequate to prove out the operation of THAAD. With the following "however"—if there were to be a failure, then it means we'd have to go back and re-examine the test program to see whether we have learned the things that are necessary.

So, there is some increased risk should there be a failure. If the success of the program continues as we have seen in the last five,

then we believe there would be adequate collection of information in order to be able to demonstrate that that system does work.

Senator BILL NELSON. In the testing, a lot of models and simulations are used to predict the performance of the system. Have there been instances that you know of where the models of the GMD program—or other programs—did not correctly predict the performance of the system?

Dr. MCQUEARY. I do not know the answer to that question, directly. If I may put a slightly different turn to the question on modeling and simulation, I believe very strongly that good modeling and simulation is an essential part of this program, because the battlespace in which the system has to operate is very large and multi-faceted.

In my judgment, the country will not be able to afford to test every single possibility as to what one would do. The way one develops high confidence, and the way such a complex system as this would operate, would be to develop good modeling and simulation, use the testing that is done to prove that modeling and simulation does accurately represent what happens. I believe General Obering is on a path that will let us do that.

We do not have a "BMDS" model at this point in time that we can point to and say, "Let's exercise this" to do what I've described. But MDA does have a program to try to get us to the point where we can do what I've described, because I don't know of any other way to be able to gain high confidence that the system will work because the testing is quite expensive, as we all know.

Senator BILL NELSON. So, the ideal is to model and test, and then flight test.

Dr. MCQUEARY. Yes, sir. In fact, I'm a believer that you should use your modeling to predict what is going to happen in a test, in advance, and then measure how that actually comes out in the real test. Because that's an important way of helping to determine that the model itself is indeed a valid model for what is happening.

Senator BILL NELSON. So, if there was a problem in the modeling and the simulation, you'd find it out when you did the flight test?

Dr. MCQUEARY. That's right. These two things need to go hand-in-glove, if you will, in order to provide an effective set of data and information that can be used in judging the efficacy of the system.

Mr. FRANCIS. Mr. Chairman, if you go back in history and look at the THAAD program, before it became part of missile defense, that was, in fact, the case—there was modeling and simulation to predict its performance, and it's been a while, but there were probably seven, eight, or nine flight tests before they could use the flight test data to correct the model. So, it takes quite a bit of time before the model is a good predictor, if you will.

Senator BILL NELSON. In your opinion—and that was with regard to THAAD——

Mr. FRANCIS. Yes.

Senator BILL NELSON. In your opinion, with regard to the GMD system—where are we there?

Mr. FRANCIS. I think right now we haven't had enough of the data to say we know the model works. I know MDA is working on a more sophisticated model. So I would say that, in terms of confidence level, the jury is still out on that.

General OBERING. Sir, if I could add to that, Senator?

It's good to be precise here. We have models of the way the interceptor will perform, the way the radars will perform, the fire-control system will perform, that we predict. I will say—and we'd have to go into a more detailed session, obviously—that we get very good correlation between what the anticipated performance of that is, and what we see in our flight testing. Where we have disconnects with what the models predicted, and what actually happened in the flight test, is sometimes where you have a failure.

For example, we never modeled that the interceptor wasn't going to fly out of the silo at Kwajalein back in December 2004. When you have component failure like that, then that's not an indicator that you have a bad model, that just means that you had a component failure, you had a reliability problem that you had to go back and address. So, we see very good correlation with what we predict to be the performance in the flight, as well as the testing that we've done on the ground, as well.

So, the challenge now, and we're working with Dr. McQueary's folks, is to take those very user-unfriendly engineering models, that are very accurate and high-fidelity, and transform those into models that the operational test community can use, models that are much more user-friendly, and represent that level of fidelity that they need to do their job. That's what we're committed to do.

Senator BILL NELSON. For both of the Generals here, General Cartwright was here a few weeks ago, and he told us it's "very important" to him to expand our missile defense system "beyond long-range intercontinental ballistic missiles to start to address those that hold at threat our forward-deployed forces, our allies, and our friends." Continuing the quote, "those are more in the short- and medium-range ballistic missiles, things such as the Patriot, the Standard Missile-2 and Standard Missile-3 will be able to address, and THAAD as it comes on."

Do you all agree with General Cartwright? He's your boss. [Laughter.]

General CAMPBELL. He's not here, though. [Laughter.]

I do agree with him. I mean, specifically, I can cite an example with the Patriot system. Today the Army has committed to building an additional two Patriot battalions to address specifically the problem that you've described. The work that MDA's doing to add the SM–3 missiles, and bring on four THAAD fire units, instead of two, recognizes that we know that there's a gap in that particular regime. So, I agree wholeheartedly with his assessment, we need to move in that direction.

General OBERING. Yes, sir, and in fact, it was General Cartwright's input and the combatant commander's input that we move forward on the THAAD program, adding more fire units, as General Campbell said, also adding, I think, about 48 more of the SM–3 sea-based interceptors to the program, being able to also add a sea-based terminal capability that also is geared toward the protection of deployed forces and embarkation points, that type of thing. So, we are paying very close attention to that.

Senator BILL NELSON. Well, we're planning a total of 96 THAAD missiles, and about 140 SM–3 interceptors. Do you think that protecting our forward-deployed forces and meeting the combatant

commanders operational requirements will require more of those systems than currently planned?

General CAMPBELL. We've done some study to a Joint Capabilities Mix, this is an initial look, but that study would tell us that we should nearly double the quantities of both SM–3 and the THAAD.

Senator BILL NELSON. The number three unfunded priority of the Army Chief of Staff is the PAC–3 Pure Fleet Initiative, General Campbell. This would upgrade all of the Patriot battalions to the latest and most capable PAC–3 configuration. The Army is working on finding funds to start that process. But, we're going to have to find more funds to complete it.

Can you tell us what kind of capability this Pure Fleet Initiative will provide, and give us your opinion if it is the cost-effective way to improve our regional missile defense capabilities?

General CAMPBELL. To address the first part of that question, I do think this is the right approach to continue to buy more of the PAC–3 system. The capabilities it will bring will be increased lethality against the targets we expect to face, and those that carry weapons of mass destruction, we'll be able to address those targets at longer ranges, and higher altitudes. We'll be able to protect more ground area, so you basically expand the capability of the system by having that PAC–3 configuration.

So, in my view, it is a proven system. We've used it now in two wars, and it would be a prudent way to go forward into the future, with a proven system, and a proven PAC–3 capability that we have right now in the battalions that we have configured to PAC–3.

Senator BILL NELSON. So, if funds were made available to support this system, you would support its implementation for the Pure Fleet Initiative?

General CAMPBELL. Absolutely, and the Army is committed to doing that. They're looking at a reprogramming action right now for this fiscal year which is up at OSD for their consideration, and we're looking ahead to next year to look at Grow the Army funding, to support the additional funds we'll need to complete the Pure Fleeting of 13 battalions.

Senator BILL NELSON. Does any of the staff have any questions? [No response.]

Thank you all, you've been very kind, very patient. Thank you for the quality of your testimony. The hearing is adjourned.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR BILL NELSON

FORWARD-BASED X-BAND TRANSPORTABLE EUROPEAN OPTION

1. Senator BILL NELSON. General Obering, if a decision were made to not deploy the 10 interceptors in Poland and the midcourse discrimination radar in the Czech Republic, would it still make sense to deploy a Forward-Based X-band Transportable (FBX–T) radar—or more than one—to Europe?

General OBERING. Yes, an AN/TPY–2 (formally known as the FBX–T) located within 1,000 kilometers of the threat launch points, would provide early tracking of an Iranian threat and would provide additional capability against potential countermeasures. The addition of another radar (e.g., the European Midcourse Radar) in Europe improves continuous tracking of the threat complex for trajectories into U.S. and Europe.

The AN/TPY–2 and the European Midcourse Radar combined with the interceptors at Fort Greely and Vandenberg Air Force Base (AFB) provides more confidence

and performance margin in the defense of the U.S. and will allow for protection of the Thule Radar against stressing threat trajectories.

However, Europe cannot defend against intermediate-range ballistic missile (IRBM)/intercontinental ballistic missile (ICBM) threats without a European interceptor site (EIS).

COMPARATIVE COSTS OF THIRD SITE OPTIONS

2. Senator BILL NELSON. General Obering, given that there are two options for the planned deployment of the final 10 Ground-Based Interceptors (GBIs)—either at Fort Greely, or in Europe—presumably Missile Defense Agency (MDA) has analyzed the comparative cost of those two options. An MDA budget chart indicates the cost of the proposed European deployment of interceptors and radars would be over $4 billion through fiscal year 2013. How much would it cost to deploy the 10 additional missiles at Fort Greely?

General OBERING. The Department's plan is to deploy GBIs 45–54 at the EIS and MDA's fiscal year 2008 President's budget request includes resources that support this plan.

It would be possible to deploy these interceptors at Fort Greely and the cost difference would be $1,461 million less than deploying them at the EIS. The total cost of the EIS site is $2,298 million which includes: $442 million to procure the 10 interceptors; $617 million for silos, launch support equipment and interceptor emplacement; $1,011 million for construction activities of the missile field, mission and supporting facilities; $130 million for interceptor and satellite communications systems; and $98 million for noninfrastructure security. The total cost of deploying the 10 interceptors to Fort Greely is $837 million which includes: $442 million to procure the 10 interceptors; and $395 million to provide a missile field in which to emplace them (including a Mechanical Electrical Building, 10 sets of silos and launch support equipment and all software upgrades needed to the Fire Control and Command Launch Equipment to support the 2-stage GBIs). Therefore, the cost of deploying these 10 interceptors at Fort Greely would be $2,298 million − $837 million = $1,461 million less than deploying them at the EIS.

However, while the emplacement of these 10 GBIs at Fort Greely would cost less, these interceptors would not provide the same defensive capability from this location as compared to the European site. The purpose of emplacing 10 GBIs at the European site is to enhance protection of the U.S homeland from emerging long range Middle Eastern threats, as well as extend missile defense coverage to our friends, allies and deployed forces in Europe from intermediate range Middle Eastern threats. This defensive capability could not be accomplished by emplacing these 10 GBIs at Fort Greely.

COVERAGE OF PLANNED SYSTEM

3. Senator BILL NELSON. General Obering, the North Atlantic Treaty Organization (NATO) Secretary General referred to different classes of NATO countries based on differing defensive coverage. Is it correct that the planned deployment of 10 interceptors in Poland and a mid-course discrimination radar in the Czech Republic would not provide protection for all of NATO European territory?

General OBERING. The percentage of NATO territory defended by the proposed deployment of the EIS, the AN/TPY (formally know as FBX–T) and the European Mid-course Radar, is 100 percent of those that are threatened by long range missiles from Iran.

Against ICBM class threats, only 20 of the 24 European NATO countries or 80 percent are vulnerable to these missiles from Iran. With the EIS and AN/TPY–2 in place, all 20 of these are defended. The four remaining countries, Turkey and portions of Greece, Bulgaria and Romania are too close to Iran's borders to be threatened by ICBM class threats.

Approximately 85–90 percent, or 23 of the 24, of the European NATO countries are vulnerable against Iranian IRBM class missiles and the EIS and AN/TPY–2 can defend all of these countries against this class of threat.

Those countries that are vulnerable to attack against the shorter range threats from Iran could be defended by deploying other U.S. missile defense forces, such as Patriot PAC–3. U.S. missile defense forces such Aegis Standard Missile-3 (SM–3) and Terminal High Altitude Area Defense (THAAD) (supported by an AN/TPY–2) could be deployed in a crisis to fill any coverage gaps. NATO missile defense forces do not now exist. The only NATO owned equipment is the Airborne Warning and Control System (AWACS). Other equipment ownership is retained by the member

nations and is counted as part of their contribution to the NATO Military Budget. This allows NATO, as an alliance or as individual countries, to focus on the deployment of the more affordable shorter range defensive systems.

4. Senator BILL NELSON. General Obering, what percentage of NATO territory would NOT be defended by the proposed deployment, and what NATO nations would not be completely covered?

General OBERING. The percentage of NATO territory defended by the proposed deployment of the EIS, the AN/TPY (formally know as FBX–T) and the European Midcourse Radar, is 100 percent of those that are threatened by long range missiles from Iran.

Against ICBM class threats, only 20 of the 24 European NATO countries or 80 percent are vulnerable to these missiles from Iran. With the EIS and AN/TPY–2 in place, all 20 of these are defended. The four remaining countries, Turkey and portions of Greece, Bulgaria and Romania are too close to Iran's borders to be threatened by ICBM class threats.

Approximately 85–90 percent, or 23 of the 24, of the European NATO countries are vulnerable against Iranian IRBM class missiles and the EIS and AN/TPY–2 can defend all of these countries against this class of threat.

Those countries that are vulnerable to attack against the shorter range threats from Iran could be defended by deploying other U.S. missile defense forces, such as Patriot PAC–3. U.S. missile defense forces such Aegis SM–3 and THAAD (supported by an AN/TPY–2) could be deployed in a crisis to fill any coverage gaps. NATO missile defense forces do not now exist. The only NATO owned equipment is the AWACS. Other equipment ownership is retained by the member nations and is counted as part of their contribution to the NATO Military Budget. This allows NATO, as an alliance or as individual countries, to focus on the deployment of the more affordable shorter range defensive systems.

5. Senator BILL NELSON. General Obering, is it possible that other missile defense systems, including PAC–3, Aegis ballistic missile defense (BMD) and THAAD could provide defensive coverage of uncovered portions of Europe against future ballistic missile threats?

General OBERING. Yes, other BMD systems could provide defensive coverage of those countries that are not threatened by longer-range Iranian missiles, but remain vulnerable to shorter range Iranian threats. Patriot PAC–3 could be deployed, or Aegis SM–3 and THAAD (supported by an AN/TPY–2) could be deployed in a crisis to fill any coverage gaps. The number of ship locations and THAAD or PAC–3 batteries required will depend on the threat missile class type (i.e. IRBM or shorter range class threat) and the sensor architecture used.

These gaps could also be covered with a combination of U.S. and NATO, or indigenous defensive capabilities. NATO missile defense forces do not now exist. The only NATO owned equipment is the AWACS. Other equipment ownership is retained by the member nations and is counted as part of their contribution to the NATO military budget. This allows NATO, as an alliance or as individual countries, to focus on the deployment of the more affordable shorter range defensive systems.

DEFENSIVE COVERAGE OF THE UNITED STATES

6. Senator BILL NELSON. General Obering, is it correct, as you have indicated, that the ground-based midcourse (GMD) system currently deployed in Alaska and California would provide defensive coverage of the United States against a potential future Iranian ICBM threat?

General OBERING. Yes, the ground based interceptors, currently deployed in Alaska and California, provide defensive coverage of the United States against potential Iranian ICBMs. This coverage is dependent on both the Fylingdales radar in the United Kingdom and the Thule radar in Greenland.

The addition of a forward based radar and Eurpoean Midcourse Radar located, combined with the interceptors in Alaska and California, adds confidence and performance margin in the defense of Alaska and provides a hedge against threat uncertainty.

The defense of the Fylingdales radar requires a EIS or another Ballistic Missile Defense System (BMDS) asset with capability to defend against ICBM and IRBM class threats.

NEAR-TERM, EFFECTIVE SYSTEMS

7. Senator BILL NELSON. General Obering, last year Congress enacted legislation, section 223 of Public Law 109–364, that requires the Department to place a priority within the missile defense program on the development, testing, fielding and improvement of effective, near-term missile defense capabilities, specifically including the GMD system, the Aegis BMD system, the Patriot PAC–3 system, and the THAAD system, as well as their associated sensors. Can you tell us how the Department has implemented this requirement, and what changes were made to comply with this provision? In your answer, please indicate the fiscal year 2008 funds requested for these near-term capabilities.

General OBERING. The development, fielding, testing and improvement of effective near-term missile defense capabilities is a priority within the MDA and about $7.1 billion out of our total fiscal year 2008 President's budget request of $8.9 billion is allocated for this purpose. In the near-term, we seek to maintain and sustain an initial capability to defend the homeland against limited ICBM threats and protect friends and allies and deployed forces against short- to medium-range threats. To achieve this goal, over the Future Years Defense Program (FYDP) we intend to complete the fielding of up to 44 GBIs in Alaska and California; enhance our early warning radars in Alaska, California and the United Kingdom; field the Sea-based X-band (SBX) radar in the Pacific; field the first transportable THAAD fire units; deploy up to 132 sea-based SM–3 interceptors on 18 Aegis engagement ships; and expand our command, control and battle-management network by establishing three new command and control suites at U.S. Strategic Command, U.S. Pacific Command and U.S. Northern Command.

In the near-term we also seek to close gaps and improve our capability to keep pace with growing threats. Accomplishing this objective requires the fielding of up to 10 GBIs and an associated GMD radar in Europe. We have also allocated resources which support continued development work that will improve these initial missile defense assets, and we continue to fund an increasingly operationally realistic testing program.

The following chart provides funding details. Note that funds for procurement of PAC–3 missiles are included in the Army budget and the following chart shows MDA resources used for continued development of PAC–3.

Funding for Near Term Missile Defense

		FY07	FY08	FY09	FY10	FY11	FY12	FY13	Total FY08-13
Total Near Term		**7,578.307**	**7,053.777**	**7,138.861**	**6,473.193**	**5,482.081**	**4,465.207**	**4,509.008**	**35,122.126**
Maintain and Sustain		**6,924.624**	**5,923.125**	**5,375.194**	**4,777.862**	**3,920.346**	**3,271.345**	**3,664.439**	**26,932.310**
Development		**5,183.594**	**4,125.724**	**3,894.697**	**3,851.022**	**3,245.999**	**2,641.256**	**3,023.828**	**20,782.525**
GMD	Block Development	1,586.577	1,007.567	855.891	902.094	614.482	256.614	547.957	4,184.605
AEGIS	Block Development	793.083	758.990	734.685	807.005	720.588	708.946	739.171	4,469.385
THAAD	Block Development	744.489	484.196	411.486	311.663	341.110	256.454	256.527	2,061.437
PAC-3	Debri Mitigation	1.593	0.982	0.000	0.000	0.000	0.000	0.000	0.982
	Test and Targets	761.473	659.642	628.377	600.584	566.921	529.358	552.329	522.628
	Core Technical Support	1017.294	886.156	885.358	888.247	786.714	699.614	726.129	718.018
	Program Management	279.085	328.190	378.900	341.430	216.185	190.270	201.714	239.527
Fielding		**1,142.759**	**1,153.001**	**875.787**	**418.882**	**166.670**	**152.342**	**162.012**	**2,928.694**
GMD	Missiles 1-44, FGA Expansion	729.039	644.313	285.593	169.602	12.502	7.403	0.000	1,119.413
AEGIS	Weapon System, SM-3 Missile	249.200	174.500	209.400	163.000	120.100	120.300	137.000	924.300
THAAD	Fire Unit #1 and #2	149.128	328.722	354.831	75.215	2.005	0.000	0.000	760.773
C2BMC	Site Activation/Fielding	15.392	5.466	25.963	11.065	32.063	24.639	25.012	124.208
Sustainment		**598.271**	**644.400**	**604.710**	**507.958**	**507.677**	**477.747**	**478.600**	**3,221.092**
GMD	SBX, SDP II	493.936	495.481	439.677	325.743	334.543	359.881	365.263	2,320.588
AEGIS		20.000	43.800	42.600	46.100	31.400	0.000	0.000	163.900
THAAD		0.000	1.148	21.847	28.888	41.053	45.009	41.259	179.204
DFO	MDA Operations Center (MOC)	5.830	5.219	5.454	5.699	5.958	6.226	6.507	35.063
C2BMC	Includes DMeTS	78.505	98.752	95.132	101.528	94.723	66.631	65.571	522.337
Close Gaps and Improve		**653.683**	**1,130.652**	**1,763.668**	**1,695.331**	**1,561.736**	**1,193.861**	**844.568**	**8,189.816**
Development		**215.282**	**406.168**	**470.980**	**441.970**	**415.041**	**370.248**	**307.346**	**2,411.753**
BMDS Radars	AN/TPY-2 Radar Development	129.817	221.678	239.151	221.804	201.786	165.924	156.899	1,207.243
	BMDS 3rd Site System Test	0.000	0.000	2.955	10.113	12.534	5.376	0.000	30.979
	Other Development Activities	85.466	184.490	228.874	210.053	200.721	198.948	150.447	1,173.532
Fielding		**377.802**	**555.226**	**1,149.118**	**1,008.384**	**818.073**	**475.367**	**184.807**	**4,190.974**
GMD	European Site, GBIs 45-54	62.900	166.184	573.947	493.146	505.938	297.826	33.920	2,070.961
BMDS Radars	AN/TPY-2 Radar Deployment,	314.902	256.980	434.708	368.793	262.640	171.491	132.384	1,626.997
C2BMC	Comms and Shelters for Radars	0.000	132.062	140.463	146.445	49.494	6.050	18.503	493.016
Sustainment		**60.598**	**169.258**	**143.570**	**244.977**	**328.622**	**348.247**	**352.416**	**1,587.089**
GMD		0.000	0.000	0.624	22.538	15.850	15.962	8.480	63.454
BMDS Radars		60.598	138.162	85.003	129.572	145.661	147.240	148.767	794.404
DOSS		0.000	22.646	41.400	71.184	122.872	123.388	136.456	517.946
C2BMC		0.000	8.450	16.543	21.683	44.240	61.657	58.713	211.285

KNOWLEDGE-BASED APPROACH

8. Senator BILL NELSON. Mr. Francis, the Government Accountability Office (GAO) has recommended that the MDA should use a "knowledge-based" acquisition approach for all its programs. Apparently MDA has only partially implemented your "knowledge-based" recommendation and has a different understanding of that concept. Can you describe what you mean by a "knowledge-based" acquisition strategy, and how it differs from what you understand the MDA approach is?

Mr. FRANCIS. Much of what MDA has written about knowledge-based acquisition agrees with GAO's definition. However, we have not seen MDA put into practice an entirely knowledge-based strategy. Instead, it has implemented some aspects of the strategy. MDA defines knowledge points as those times within a program that data is obtained from discrete tests, demonstrations, or processes. This data is used to

confirm earlier estimates or predictions and is to be linked with an explicit decision. The decision could involve money, schedule, performance requirements, or proceeding to the next stage of development. These knowledge points are program-specific, and MDA will measure actual performance for an individual program, like Airborne Laser, against the knowledge points it has set for that program.

We identify three key points in a program when specific knowledge is important to success. These points represent aggregations of knowledge that can be judged against objective standards for acceptability. They correspond to the points at which a program is making investment decisions. These knowledge points and associated indicators are defined as follows:

Knowledge point 1

Resources and needs match. This point occurs when a sound business case is made for the product—that is, a match is made between the customer's requirements and the product developer's available resources in terms of knowledge, time, money, and capacity. Achieving a high level of technology maturity at the start of system development is an important indicator of whether this match has been made. This means that the technologies needed to meet essential product requirements have been demonstrated to work in their intended environment.

Knowledge point 2

Product design is stable. This point occurs when a program determines that a product's design is stable—that is, it will meet customer requirements, as well as cost, schedule, and reliability targets. A best practice is to achieve design stability at the system-level critical design review, usually held midway through development. Completion of at least 90 percent of engineering drawings at the system design review provides tangible evidence that the design is stable.

Knowledge point 3

Production processes are mature and the design is reliable. This point is achieved when it has been demonstrated that the company can manufacture the product within cost, schedule, and quality targets. A best practice is to ensure that all key manufacturing processes are in statistical control—that is, they are repeatable, sustainable, and capable of consistently producing parts within the product's quality tolerances and standards—at the start of production. Demonstration of a prototype that meets reliability and performance requirements prior to the production decision can minimize production and post-production costs.

We have not seen MDA gather all of the knowledge discussed above before deciding to move forward in the acquisition cycle. For example, MDA made the decision to produce and field the Ground-based Midcourse Defense System before it tested the element using production-representative hardware, in addition, MDA produced interceptors for operational use when it had not completed a successful intercept test in 2 years. Another example is MDA's establishment of the MKV program office and appointment of a program manager before technologies critical to the capability desired were mature and before it could prepare a knowledge-based estimate of developmental cost.

MDA USING FUNDS FOR PURPOSES NOT AUTHORIZED

9. Senator BILL NELSON. Mr. Francis, you noted in your report that funding for an element of the BMD system is authorized to cover a range of activities and that if the MDA runs into problems with one activity, it can defer work on another activity to cover the cost of the problems. This sometimes means that funding authorized for one activity is used for another purpose. Do you have any thoughts as to how Congress might ensure that the funding it authorizes is used for the purpose for which it was authorized?

Mr. FRANCIS. To effectively manage the BMDS, MDA may need some flexibility to use funds for purposes other than those for which the funds were appropriated. For example, a more pressing need for the funds may arise or the agency may want to speed-up the development of an element that is maturing faster than expected. However, in instances where Congress has a special interest in knowing that funds are being used for their intended purpose, it could set dollar thresholds for moving funds within a budget program element that would trigger a report to Congress should that threshold be breached. We think this can be done in such a way that

the MDA Director maintains his ability to make such decisions expeditiously, but at the same time providing Congress transparency into the consequences of those decisions. Congress might also consider designating certain funds as "special interest" and requiring that the use of any of the funds for any other purpose be reported.

MDA could provide increased transparency of deferred work in a couple of ways. First, it could report the cost of deferred work as a cost of the block that it benefits. For example, work deferred from Block 2004 until Block 2006 could be accounted for and reported as a cost of Block 2004, regardless of when the work is performed. Alternatively, when MDA requests funds during a subsequent block to pay for deferred work, the agency could notify Congress that it is requesting funds for this purpose. The notification could include an identification of the block in which the work was originally planned and the amount of funding needed to pay for the deferred work.

10. Senator BILL NELSON. Mr. Francis, would requiring that MDA notify Congress when it reprograms funding within a program element be a useful management process?

Mr. FRANCIS. Yes. By notifying Congress when it reprograms funds within an element, MDA would improve the transparency of its actions. An individual element can cover a full range of activities, including technology development, system development, production, fielding, and support. I think it is a reasonable expectation, given MDA's flexibility to move funds between these activities, that MDA notify Congress when it is doing so. However, notifying Congress may not necessarily have to mean obtaining prior approval, as discussed in the answer to question 11.

11. Senator BILL NELSON. Mr. Francis, another option would be to require prior approval by Congress of certain proposed reprogramming actions, as is frequently done with other programs. In your view, could that be a useful oversight tool?

Mr. FRANCIS. MDA is required to report all reprogramming actions that result in $10 million or more being moved from one budget program element to another. There are benefits in terms of control in expanding MDA's reporting requirement to include some intra-program element reprogramming actions. For example, it may be worthwhile to report actions that involve the movement of funds from one activity to another within a program element if an established cost threshold is breached or if MDA plans to use funds appropriated for an activity in which Congress has a special interest for some other purpose. However, this amount of control must be weighed against the potential loss of flexibility that MDA currently has to manage its system of systems. For example, if prior approval were required before moving funds from one activity to another within a program element, the decisions would take longer. Alternatively, Congress could consider requiring notification of such reprogramming without necessarily requiring prior approval. This would preserve MDA's flexibility while providing Congress transparency into the reprogramming decisions.

INDEPENDENT LIFE-CYCLE COST ESTIMATE

12. Senator BILL NELSON. Mr. Francis, your report notes that the MDA is not required to obtain an independent life-cycle cost estimate of the BMD System or its elements, as other major defense acquisition programs are required to do. From a standpoint of oversight and accountability, do you believe it would be useful to have an independent life-cycle cost estimate for the BMD System and its elements?

Mr. FRANCIS. Yes, increments of elements that have effectively entered system development and demonstration should be able to produce the information needed to estimate the life-cycle cost of that increment and to enable the Cost Analysis Improvement Group (CAIG) to independently verify that estimate. As we pointed out in our March 2007 report, independent verification of a program's cost estimate allows decision makers to gauge whether the program is executable given other budget demands and it increases the likelihood that a program can execute its plan within estimated costs. However, we note that an element program office may have some ongoing efforts whose cost cannot be estimated. For example, a program could have one increment in system development and demonstration, but it could also be developing the technology important to a future increment. In such instances, the element program office would only estimate and have the CAIG validate the life-cycle cost of the increment whose technology is being integrated into a complete product. Studies of the best practices of leading commercial developers have shown that until all technologies critical to a desired capability are mature managers cannot make

good cost, schedule or performance estimates. This is because technology development is a time of discovery that cannot be scheduled, whose outcome cannot be predicted, and whose cost cannot be accurately estimated.

ELEMENT-LEVEL REPORTING

13. Senator BILL NELSON. Mr. Francis, your report recommends that the BMD program should report on cost, schedule, and performance at the individual missile defense element level, rather than at the entire BMD System level. Can you explain why, and why you think that should happen now?

Mr. FRANCIS. In our opinion, MDA should report on cost, schedule, and performance at both the BMDS level and the element level. Element-level reporting is needed because since 2002, MDA has achieved its primary mission of developing, fielding, and supporting an integrated BMDS through the efforts of individual BMDS elements. Most of the agency's budget is requested by the elements and a significant amount of the agency's work is accomplished through element contracts. For example, over 73 percent of MDA's fiscal year 2005 budget and 72 percent of the agency's fiscal year 2006 budget was devoted to the support of the nine BMDS elements. It makes sense to report in the same manner that funds are budgeted. The elements provide the individual assets and capabilities that help comprise the overall BMDS capability.

This does not mean that the BMDS has to be managed in a stove-piped, element-centric manner, however. I believe MDA should continue to manage BMDS as a system-of-systems versus as a byproduct of individual elements. A system-of-systems construct, like blocks, is useful for defining and managing the increments of an integrated BMDS. Moreover, it provides more latitude to make tradeoffs among individual requirements, costs, and capabilities while preserving the integrity of the overall BMDS. The block baseline should also be consistent with the baselines of the individual elements.

The cumulative information gained from both element-level and BMDS-level baselines would allow decision makers to better assess the value that the missile defense program delivers for the investment being made. Determining the value for money is likely to become increasingly important as cost growth in entitlement programs decrease discretionary spending and as defense budgets are squeezed by mounting expenses to support the conflict in Iraq.

CONFIDENCE IN TWO-STAGE GBI

14. Senator BILL NELSON. Dr. McQueary, at the hearing I described a two-stage variant of the GBI being developed by the MDA for possible deployment in Poland. The MDA has identified seven development risk areas it is working to mitigate on this missile, which has not completed development and has never been tested. My question to you was whether you have high confidence that this undeveloped and untested missile will perform in an operationally effective, reliable, and suitable manner. What is your current assessment?

Dr. MCQUEARY. There are added risks anytime a system's working design is changed. In the case of the two-stage variant of the GBI, I agree with MDA's seven developmental risk areas. I believe the most significant risk is with the software changes and integration that MDA must make not only in the interceptor, but also in the Command and Launch Equipment and the GMD Fire Control to optimize the interceptor's new performance envelope. There is commonality between the two-stage and three-stage variants of the GBI booster. MDA gained experience when it converted a three-stage Minuteman II into a two-stage Minuteman II. However, I cannot make an assessment on effectiveness, reliability, or suitability on a two-stage design that has not yet been built or tested. Through MDA's Integrated Master Test Plan, I will approve the combined developmental/operational flight testing of the two-stage interceptor, and my office and the joint operational test team will participate in all aspects of this testing.

INACCURATE MODELS

15. Senator BILL NELSON. Dr. McQueary, at the hearing, I asked you whether you knew of instances when models had not accurately predicted the performance of the BMD System or its elements. You indicated you did not remember any specific examples. For example, did the GMD model predict that the GBI would not launch in IFT–13C, or predict the so-called "Track Gate Anomaly"?

Dr. MCQUEARY. While models can provide useful predictions of system or component performance, they generally are not designed to predict hardware failure modes or software malfunctions. The GMD model did not predict the software timing problem that aborted the launch in IFT–13C. Even when software malfunctions are discovered during test, and the models are modified or developed to account for these malfunctions, they still may not accurately predict their severity or frequency. The "Track Gate Anomaly" is a good example. The GMD model did not initially predict "Track Gate Anomaly". Models of statistical occurrence which MDA developed for the "Track Gate Anomaly" did not accurately predict the frequency of occurrence during a recent flight test.

16. Senator BILL NELSON. Dr. McQueary, can you check your agency's records to see if there are any specific examples and, if so, provide them and describe their significance?

Dr. MCQUEARY. MDA's experience with models is no different than the experiences of other acquisition programs in the Department of Defense (DOD). Some models do a good job of predicting or replicating capability and performance, and some don't. There are several examples where MDA's models did not match or predict system capabilities: [Deleted.]

FLIGHT TESTS REQUIRED TO VALIDATE MODELS

17. Senator BILL NELSON. Dr. McQueary, your prepared testimony says that for you to have confidence in your assessment of the operational effectiveness of the BMD System, you need "validated models and simulations," which you say "don't exist today because MDA does not have enough flight test data to anchor them." Can you explain what you mean by validating and anchoring models and simulations, and why it's crucial to your assessment?

Dr. MCQUEARY. One of the purposes of testing is to gather the data necessary to validate that the models accurately represent the performance of the system under test. The process is simple. The model is used pre-test to predict the performance expected during the test. The test is run and the performance data is collected. A post-test reconstruction is accomplished to compare the actual performance to the predicted performance. The model is then adjusted to better predict system performance. It is an iterative process through which the model's fidelity continually improves. Once I am satisfied that the models are validated, I can use them to assess system capability. This is especially important in assessing capability at the edges of the system's performance envelope where peacetime, safety, and fiscal constraints usually apply.

In the case of the BMDS, there are BMDS-level models and there are element-level models. I need both, correctly and efficiently working together, to accurately assess capability. Generally, the element-level models are more mature, have detailed validation plans, and are progressing toward validation through ground and flight testing. The BMDS-level models are not ready for use in my assessments, but should be ready to assess the FTG–04 pre and post test events and the Block 06 BMDS in October 2007. I am working with MDA to understand the details and the timelines associated with development, integration, and validation of the BMDS-level models. The only way MDA can validate that these models accurately predict BMDS performance is to "anchor" them to flight test data.

18. Senator BILL NELSON. Dr. McQueary, why would you not accept models and simulations as a substitute for flight tests?

Dr. MCQUEARY. We need the flight tests to validate that the models and simulations accurately reflect the performance of the system under test. Once they have been validated through flight test, they can be used confidently to predict system performance.

OPERATIONALLY REALISTIC GMD SALVO TESTING

19. Senator BILL NELSON. Dr. McQueary, everyone seems to agree on the need for operationally realistic flight testing as the best means to have confidence in the operational capability of the BMD system. Since the GMD system firing doctrine is premised on being able to fire two interceptors at each target, do you agree that it would be important to test and demonstrate that capability in flight testing, as we are doing with other systems?

Dr. MCQUEARY. The ability of the GMD element of the BMD system to launch and guide two interceptors on a single target is an important capability that MDA

must demonstrate to validate warfighter firing doctrine. The Patriot element has demonstrated this capability. Both the Aegis BMD and THAAD elements plan future tests to demonstrate this capability. It is logical that GMD should do so also. However, this test will require additional investment in the test infrastructure at Vandenberg AFB including the temporary modification of an operational silo into a test silo.

MULTIPLE TARGET GMD TESTING

20. Senator BILL NELSON. Dr. McQueary, the GMD system is designed to defeat a small number of relatively simple targets. Do you believe it would be valuable to demonstrate that capability with flight testing of the system against multiple targets, so we have confidence in its capability? Would that be operationally realistic given the GMD mission?

Dr. MCQUEARY. Yes, but to do so within the capabilities of peacetime range and safety limitations will require sizeable investment in infrastructure (telemetry and flight safety systems) and more extensive coordination. A GMD flight test involving multiple targets and interceptors would be operationally realistic and, if successful, confidence building. Patriot has already demonstrated this capability. Aegis BMD recently demonstrated the capability to manage near simultaneous engagements of a ballistic missile and a cruise missile threat.

JOINT CAPABILITIES MIX STUDY

21. Senator BILL NELSON. General Campbell, the Joint Force Component Command for Integrated Missile Defense (JFCC–IMD) conducts studies and analyses on missile defense capabilities, needs, and force structure. What are results of the Joint Capabilities Mix Study with respect to desired or required force structure of our regional missile defense systems, namely Patriot/PAC–3, Aegis BMD, and THAAD?

General CAMPBELL. The Joint Capabilities Mix (JCM) Study is an iterative opportunity for the joint communities of interest (including combatant commanders, Services, and the MDA) to explore weapons and sensor mixes to counter the expected threats in three major operation areas across three epochs (2012, 2015, 2020). JCM I, concluded in April 2006, influenced MDA programmatic decisions to increase the number of Terminal High Altitude Area Defense (THAAD) firing units and interceptors, increase SM–3 interceptors, and start the Sea-Based Terminal program. JCM II has just concluded and results are being staffed and briefed through the Joint Requirements Oversight Commission process. The findings provide a recommendation of the number of upper-tier (THAAD and SM–3) interceptors required for certain contingencies. Additional study will be required to further refine the analysis.

22. Senator BILL NELSON. General Campbell, do we have enough force structure today to satisfy combatant command operational plans, and are we planning and budgeting for enough in the FYDP? If not, which systems would we need more of to meet their operational plans?

General CAMPBELL. Requests for land and sea-based capabilities have emerged which significantly exceed the near-term worldwide inventory. The MDA has increased the Terminal High Altitude Area Defense (THAAD) equipment buy. The Army has requested an increase in force structure to man the additional THAAD equipment and has requested additional Patriot battalions as part of its plan to Grow the Army. For missile inventory, MDA has increased its THAAD and SM–3 buy. The Army continues to purchase and build the PAC–3 inventory, and is preparing to transition to the new PAC–3 Missile Segment Enhanced missile in fiscal year 2010. This new missile will significantly increase the Patriot battlespace and provide capability against a larger threat set. We continue to refine force structure requirements through additional analysis and inform MDA of future combatant command capability needs through the Prioritized Capability List.

MILITARY UTILITY ASSESSMENT

23. Senator BILL NELSON. General Campbell, I understand that the JFCC–IMD has performed several military utility assessments of the GMD system for General Cartwright. How many of the assessments have been conducted and what have been the general conclusions for each of them?

General CAMPBELL. Strategic Command has conducted three military utility assessments. This annual assessment has been consistent in concluding that the BMDS provides a "thin line" of capability against the threat. The MDA has deliv-

ered additional capability each year, adding greater confidence in the operation of the BMDS.

UPGRADED/EVOLVED THAAD MISSILE

24. Senator BILL NELSON. General Campbell, the missile defense system is intended to be a spiral development program. There is an opportunity to upgrade the THAAD missile to have far greater capability against missiles of greater range and complexity. Do you support increasing the capability of the THAAD missile to provide enhanced defensive capability?

General CAMPBELL. The Terminal High Altitude Area Defense (THAAD) is an emerging capability for area defense. There are potential opportunities to develop more robust enhancements to the THAAD missile in future years. However, the increase in cost to field these enhancements is dramatic, even when compared to what is currently programmed. The planned THAAD program will provide a terminal upper tier capability that complements our midcourse and lower tier systems. We should continue to build a balanced BMDS as currently planned. We should examine THAAD's potential for growth and determine if the cost of the additional capability allows us to sustain a balanced program.

QUESTIONS SUBMITTED BY SENATOR CARL LEVIN

WHICH MISSILE FOR DEPLOYMENT?

25. Senator LEVIN. General Obering, if the decision were made to deploy GBIs 41–50 at Fort Greely, rather than in Europe, would you deploy more of the existing 3-stage interceptors, or use the new developmental 2-stage version?

General OBERING. If the decision were made to deploy GBI's 45–54 at Fort Greely rather than in Europe, more of the existing 3-stage interceptors would be used. The 2-stage configuration GBI is being developed specifically for the EIS. Its shorter minimum engagement time is better suited to engage threat ranges in the European Theater. The EIS, combined with a forward-based radar, provides considerable redundant coverage of the U.S. and, depending on the threat, defends Western and Central Europe and most of Eastern Europe. Neither three-stage nor two-stage interceptors at Fort Greely and Vandenberg AFB can defend Europe.

26. Senator LEVIN. General Obering, since the budget request seeks funds for the possible deployment of GBIs 41–50 at Fort Greely, does the funding requested in the fiscal year 2008 budget request for interceptors 41–50 permit the production of 10 more three-stage GBIs?

General OBERING. Yes, funding requested for OBV–2 stage (GBIs #45–54) could be diverted and used to acquire 3-stage GBIs in full, and emplacing these interceptors at Fort Greely would provide additional capability for the BMDS. However, The Department's plan is to deploy the OBV–2 stage at the EIS and the resources requested in MDA's fiscal year 2008 President's budget support this plan. The purpose of emplacing these interceptors at the European site is to enhance protection of the U.S homeland from emerging long range Middle Eastern threats, as well as extend missile defense coverage to our friends, allies and deployed forces in Europe from long-range and intermediate-range Middle Eastern threats. This defensive capability could not be accomplished by emplacing three-stage GBIs at Fort Greely.

RESULTS OF SEPTEMBER GMD FLIGHT TEST

27. Senator LEVIN. General Obering, the flight test of the GMD system last September (FTG–02) was considered a success. However, I understand that there were some technical issues with the interceptor that caused a 4-month delay in the next test of the system. Please describe those technical issues and the status of the corrections for them.

General OBERING. [Deleted.]

POLISH CONCERN

28. Senator LEVIN. Mr. Green, the former Polish Minister of Defense, Radek Sikorski, who is now a member of Poland's parliament, recently wrote in the Washington Post that the U.S. proposal to place GMD interceptors and a radar in Europe "could provoke a spiral of misunderstanding, weaken NATO, deepen Russian para-

noia, and cost the United States some of its last friends on the continent." If that were the result of the proposed deployment in Europe, do you believe that would be in our national security interest, and would you support such a deployment?

Mr. GREEN. If these outcomes were likely, we would reconsider our plans to deploy U.S. missile defenses in Europe. However, in light of recent events, I believe such results are unlikely.

NATO ministers met at the North Atlantic Council meeting on April 19 and, according to Secretary General Jaap de Hoop Scheffer, "agreed that the threat of missile attacks is real and that NATO is the right framework for discussions on missile defense." Rather than indicating that missile defense initiatives would divide and weaken the Alliance, NATO members expressed "a shared desire that any U.S. system should be complementary to any NATO missile defense system" and that "the principle of indivisibility of security should apply." Moreover, NATO recently decided to assess the full political/military implications for the Alliance of the U.S. missile defense proposal and prepare a report by February 2008.

U.S. Government representatives have consulted with and briefed numerous European government and European Union representatives on U.S. plans for basing missile defenses in Europe. These officials appreciated the U.S. efforts to apprise them of its plans, and they left the meeting with a better understanding of U.S. intentions. Although a few officials expressed reservations, most have responded positively.

With regard to Russia, U.S. officials have met with the Russians repeatedly to explain that limited U.S. missile defense deployment in Europe is not directed at Russia and that it does not constitute a threat to Russian strategic forces. A detailed list of missile defense cooperation opportunities has also been presented to the Russians, which they agreed to discuss in technical expert meetings. President Putin did offer to drop Russian objections to the U.S. proposal to place missile defense assets in Poland and the Czech Republic if the U.S. would agree to use the Russian-controlled radar in Gabala, Azerbiajan in lieu of a new radar in the Czech Republic. Secretary Gates said he was pleased that the Russians acknowledge the threat of Iranian ballistic missiles and that action is necessary to counter this threat. He also said that although the U.S. is still firmly committed to bilateral negotiations with the Czech Republic, we look forward to discussing the Russian proposal at technical expert meetings in the future.

WHO PAYS FOR DEFENSE OF NATO?

29. Senator LEVIN. Mr. Green, NATO has a long-standing tradition of having financial burden-sharing arrangements with the United States in which NATO pays for a share of the military capabilities that provide its protection and security. How much of this proposed $4 billion missile defense system intended to defend Europe will NATO be paying for under a NATO burden-sharing agreement?

Mr. GREEN. The U.S. Government has made a proposal to deploy U.S. missile defense assets in Poland and the Czech Republic that will help defend the U.S. homeland and U.S. forces in Europe from long-range threats from Iran. The U.S. missile defense site also will be capable of defending much of Europe. We are not asking NATO to contribute financially to the cost of this deployment;

NATO missile defense contributions come in other forms. To address short and medium range missile threats, NATO has allocated 800 million (about $1 billion) for the Active Layered Theater Ballistic Missile Defense, a command and control backbone for NATO member countries' missile defense systems. If negotiations are successfully concluded with Poland and the Czech Republic, they will contribute significant "in-kind" resources in allowing U.S. systems to be deployed on their territory. The U.K. and Denmark agreed to allow the U.S. to upgrade early warning radars on their territories for BMD use.

Other NATO allies already have or are pursuing short and medium range missile defense capabilities, including acquiring/upgrading Patriot PAC–2/3 systems, and co-developing Medium Extended Air Defense System. Several of our European allies have expressed interest in acquiring sea-based midcourse interceptors for use on their Aegis-equipped ships.

HOW MANY FLIGHT TESTS NEEDED FOR CONFIDENCE?

30. Senator LEVIN. Dr. McQueary, your prepared testimony says that, because there have not been enough flight tests, you don't have validated models and simulations needed to give you confidence in the performance of the BMD System. How

many additional successful flight tests must MDA conduct before you will have high confidence in the performance predictions of BMD System models and simulations?

Dr. MCQUEARY. I cannot give you that number today. We evaluate each flight test and associated ground test campaign to assess the confidence in the predictions of the models. Last fall I told General Obering that I would need validated models and simulations to assess the capability of the BMDS. He agreed and took action to develop the plan to get the data to support validation. Although the element-level models are acceptable for performance assessment, they don't integrate well with the less mature BMDS-level models. Element and BMDS models have to work together to accurately predict BMDS performance; they do not at this time. The interfaces are different, the software languages are different, the hardware is different, and the communications links are different. Once they work together, MDA must validate that they correctly and accurately represent BMDS performance. This requires both validation plans and test data. MDA is working on both. I am working with MDA to understand the details and the timelines associated with development, integration, and validation of these models. Once MDA finalizes its plans and provides them to me, I should be able to give you an estimate of the number of flight tests required to validate the BMDS models and simulations.

31. Senator LEVIN. Dr. McQueary, how long do you expect it will take until those flight tests are conducted?

Dr. MCQUEARY. I will not be able to give you that estimate until I get the validation plans from MDA that define the number of flight tests required. However, it is imperative that General Obering continue to follow the prudent test-analyze-fix-test approach to flight testing that he adopted following the reviews of the December 2004 and January 2005 flight test failures, and I am confident he will do so.

32. Senator LEVIN. Dr. McQueary, for each of the near-term BMDS weapon elements (GMD, Aegis BMD, THAAD), how many more successful flight tests would be required for you to have confidence that the element will perform in an operationally effective and suitable manner under operational conditions?

Dr. MCQUEARY. Fiscal constraints will likely make it impossible to achieve statistical confidence in the operational effectiveness and suitability of the BMDS. For example, to achieve 80 percent confidence that an element can perform its mission successfully 80 percent of the time (80/80), the element would have to complete 10 consecutive, successful flight tests using the same geometry, scenario, and hardware/software configuration. For higher confidence/success, the number of consecutive, successful tests is even higher: 90/80–13, 80/90–21, and 90/90–28. Therefore, assessing the operational effectiveness and suitability for each element is going to be a combination of flight tests and modeling and simulation. If I have validated models and simulations, the currently planned flight test programs for Aegis BMD and THAAD should be adequate for me to assess operational effectiveness and suitability for their current spiral development phases. This assumes no further reductions in their currently planned flight test programs. On the other hand, the current GMD flight test program is early in its developmental phase and still recovering from the two failures in December 2004 and February 2005. General Obering is following a prudent "test-analyze-fix-test" approach which, when he finds problems, results in testing delays. The current FTG–03 delay is a good example. At the same time, MDA must validate its models, a process directly related to flight testing. As a result, at this time it is impossible for me to estimate the number of successful flight tests I will need to assess GMD operational effectiveness and suitability.

OPERATIONAL TESTING

33. Senator LEVIN. Dr. McQueary, is it correct that there is still no operational testing planned for the GMD system and other MDA elements? If so, why is that?

Dr. MCQUEARY. At the present time, the only operational testing MDA plans and is conducting for GMD and the other BMDS elements is combined developmental/operational testing. My office works closely with MDA to develop the parameters of these tests. Current Department policy relieves MDA from conducting operational testing until it declares an element ready for transition to a Service with that Service planning for a production run. Congressional direction allows MDA to accomplish limited fielding using RDT&E funds.

34. Senator LEVIN. Dr. McQueary, do you believe there is still a need for operational testing of the GMD system and other elements of the BMD System?

Dr. MCQUEARY. Over the years, we have seen the value of operational testing. Every time we get the warfighters operating the systems in their intended environments and roles, we learn both the strengths and the limitations of these systems. Operational testing can take several forms. It can be the classic title 10 U.S.C. "stand alone" operational testing, or it can be combined developmental/operational testing. Following current Department policy, MDA has developed a combined developmental/operational test program for the BMDS. Using the congressionally-mandated and Director of Operational Test and Evaluation (DOT&E)/MDA-developed Operational Realism criteria, we have seen increasing operational realism in MDA's combined developmental/operational test program. This approach is not perfect, but it is working. As MDA gains confidence in the BMDS, it allows more operational realism in each succeeding test.

UNCLASSIFIED REPORTS

35. Senator LEVIN. Dr. McQueary, most of the material in your last two missile defense reports appears to be unclassified, even though the reports themselves are classified. Would it be possible for your next annual BMD report to be unclassified, with a classified annex?

Dr. MCQUEARY. We are looking at the possibility of publishing an unclassified BMDS report with a classified annex. Since the 2007 report will be a report on the BMDS Block 2006 capability (required by National Defense Authorization Act for Fiscal Year 2006) rather than a report on the 2007 test program (required by National Defense Authorization Act for Fiscal Year 2002), more of the report may be classified than in the past. We'll make the determination as we begin putting the report together. Our intent will be to make as much of the report unclassified as we can while maintaining appropriate security.

USE OF NON-RESEARCH AND DEVELOPMENT FUNDS

36. Senator LEVIN. Mr. Francis, MDA is asking Congress to extend its authorization to use exclusively research and development funds to procure and deploy operational assets. In your recent report, you recommend that future operational missile defense assets should be purchased with procurement funds. Can you comment on whether you would also recommend that MDA should request operations and maintenance funding to provide support for fielded assets, and military construction funds to build operational missile defense facilities, and if you do, why?

Mr. FRANCIS. Yes, I recommend that MDA use operations and maintenance funds to support fielded assets, as well as military construction funds to build operational missile defense facilities. First, requesting money according to the purpose for which it is to be used would put MDA's budget on the same basis and terminology as that of other programs. Second, because MDA's budget already identifies the funds it plans to use to operate and maintain assets in the field, it would not be difficult for MDA to formulate a request for operations and maintenance funds. Third, using the correct appropriation to request funds would improve transparency and accountability as funds could not be moved between appropriations without congressional approval. In addition, because military construction projects must provide for full funding of the complete cost of construction, Congress will be aware of the full cost of a project at the time funds are requested and future Congresses will not be in the position of having to provide additional funds to ensure a usable end item.

COMPARING ACQUISITION FLEXIBILITY

37. Senator LEVIN. Mr. Francis, are there other major defense acquisition programs that have been given the same level of acquisition flexibility as has been granted to the BMD program? If so, do you see the same issues with program transparency, accountability, and oversight in those programs as you see in the missile defense program?

Mr. FRANCIS. I am not aware of any other acquisition program that has been granted as much flexibility as MDA. DOD has allowed other programs some limited flexibility. For example. DOD has allowed the Future Combat Systems program more fluidity in establishing requirements and less stringent milestone exit criteria. However, the program does operate within the traditional acquisition framework that makes programs accountable for their planned outcomes and cost. MDA on the other hand is not yet required to apply several important oversight mechanisms that, among other things, provide transparency into program progress and decisions. For example, MDA is not expected to comply with user-established requirements,

operational requirements documents, an approved program baseline, independent cost estimates, or milestone decisions.

QUESTIONS SUBMITTED BY SENATOR JACK REED

IMPROVED TRANSPARENCY REPORTING

38. Senator REED. General Obering, in its March 2007 report, the GAO recommended that to improve the transparency of the BMD program, MDA should establish cost, schedule, and performance baselines for those elements effectively in the "system development and demonstration" phase, and report against those baselines. MDA partially concurred with this recommendation, but was concerned that an element-centric approach would detract from its efforts to develop a single integrated BMD System. GAO continues to support its recommendation because the element-centric reporting approach reflects the way MDA requests funding and contracts for development of the BMD System. What reporting basis would MDA recommend to provide a similar level of transparency as reporting against element baselines would provide?

General OBERING. We understand the GAO's desire for traceability. However, we are convinced that the element-centric reporting approach that GAO prefers is not the best way, nor the only way to achieve its objectives. As indicated in the DOD response to the GAO, the single integrated development approach for the BMDS has afforded the MDA the opportunity to make both technical and programmatic trades; thus enabling us to rapidly make prototype and test assets available for operational use. We stated our intent to modify our current biennial block approach to improve our reporting against the system-level baselines in accordance with section 234 of the National Defense Authorization Act for Fiscal Year 2005. We have not yet worked out the details of a new reporting basis, but we intend to work with both the GAO and your staff as we proceed with this effort over the coming months. We believe the result of this effort will be a reporting system that will provide appropriate transparency to satisfactorily address GAO's concerns.

39. Senator REED. General Obering, would MDA adjust its budget requests and contracts to match its reporting approach?

General OBERING. Because we have not worked out the details of a revised block approach, I cannot answer your question directly at this time. I do not anticipate that we would adjust budget requests or contracts to fit the reporting requirements. As I see it, the definition of the work to be done determines how we structure our budget requests and our contracts. Reporting must be adapted to reflect accurate and meaningful information. Reporting requirements must not be allowed to dictate how we structure our program. Sound management practice must remain focused on desired program investment outcomes; reporting is important and necessary in that context, but should not become more important than successfully fielding BMDS capability.

IMPROVED ACCOUNTABILITY INFORMATION

40. Senator REED. General Obering, in commenting on GAO's March 2007 report, MDA partially concurred with GAO's recommendation to provide program element information that is consistent with the acquisition laws that govern baselines and unit cost reporting. However, MDA did not fully concur because it was concerned that element-level reporting would have a potentially fragmenting effect. The agency did, however, agree to provide additional information to Congress to promote accountability, consistency, and transparency. What kinds of information does MDA plan to provide that will make the missile defense program more accountable and transparent?

General OBERING. We have not yet worked out the specific details of a new reporting approach. However, we will work with GAO to establish a reporting system that will satisfactorily address their concerns, but does not adversely affect the BMDS program by focusing on the parts to the detriment of the whole.

JAPAN AGREEMENT ON MULTIPLE KILL VEHICLE

41. Senator REED. General Obering, you have decided to pursue a Multiple Kill Vehicle (MKV) program for the Standard Missile –3, Block 2 interceptor that the United States is developing with Japan. Has Japan agreed to pursue only a MKV, and to forego the planned unitary kill vehicle?

General OBERING. MDA has not made a final decision on when to pursue an MKV program for the SM–3 Block IIA. MDA has presented briefings on the MKV program and an U.S.-only analysis plan during meetings with Japanese officials since December. Japan reaffirmed its desire to continue with the current SM–3 Blk IIA Cooperative Development project. Japan also said that it understands that the threat is evolving and given sufficient justification would consider cooperating on MKV as a separate program. The Japanese representatives stressed the necessity of receiving from the U.S. information on the evolving threat to help develop a consensus within the MOD on how best to proceed. Next steps are for the U.S. to report the results of its U.S.-only analysis in May and for the U.S. to encourage Japanese leadership to begin a joint analysis in June.

42. Senator REED. General Obering, what will you do if Japan does not agree to your plan for MKV?

General OBERING. We have just begun discussions with Japan on the MKV concept and hope that our U.S.-only analysis encourages Japanese leadership to begin a joint analysis in June. We look forward to further discussions with Japan on this subject throughout the year.

43. Senator REED. General Obering, what is your backup plan if MKV technology does not work?

General OBERING. The MKV provides considerable capabilities to engage multiple warheads and overcome countermeasures that the single kill vehicles cannot address. However, if the MKV technology does not work, the alternative is to use a single kill vehicle (or kinetic weapon) variant of the MKV payload.

NEED FOR MORE TESTING ON C2

44. Senator REED. Dr. McQueary, the nerve system and brain of the BMD is its Command and Control, Battle Management, and Communications system. It is an incredibly complex system with many sensors with different views of activities at different times, all of which must be fused together to form one common, coherent, and integrated picture to help decisionmakers understand what is happening and provide the ability to manage and control the system under stressing conditions. If the Command and Control system fails, the system could fail, or at least fail to perform optimally. Do you believe there is a need to do more testing of the Command, Control and Battle Management system to better understand its capabilities and limitations, and to help improve it? If so, what additional testing do you believe would be necessary or useful, and why?

Dr. MCQUEARY. Last year MDA adopted a year long "campaign" approach for testing the Command and Control, Battle Management, and Communications (C2BMC). It is a "crawl-walk-run" approach that builds up to a fully-distributed test of all the ground hardware and communication links in the BMDS. This is a logical way for MDA to incrementally add and test C2BMC capability. Last year's campaign, the Ground Test 01 series, was very successful. MDA is well into this year's campaign, the Ground Test 02 series. As MDA adds operational realism to the individual flight tests, it is doing more and more testing of the C2BMC capability to fuse data to form one common, coherent, and integrated picture. C2BMC testing at various levels and complexity is nearly continual now. Overall system performance improvements are limited primarily by the speed at which the software in this massive system can be improved, modified, tested, and integrated. I am satisfied with the level of testing that MDA is currently pursuing.

IS ONE FLIGHT TEST ENOUGH?

45. Senator REED. Dr. McQueary, if an element of the BMD system has one successful flight test, is that enough to give you confidence that it will work in an operationally effective and suitable manner, or do you need to conduct multiple flight tests using different operationally realistic and complex scenarios to provide confidence in system performance?

Dr. MCQUEARY. Other than Patriot, I'm not ready to state that any element of the BMDS is operationally effective and suitable. Repeatability is a very important element of operational effectiveness and suitability. One successful test doesn't demonstrate operational effectiveness or generate enough data to determine suitability. Additional testing in multiple realistic and complex scenarios will increase confidence, but will be restricted by peacetime safety and fiscal constraints. The tests that MDA does accomplish will help anchor the models and simulations which we

can then use to evaluate capability in much more of the performance envelopes of the various elements of the BMDS.

STILL A LONG WAY TO GO

46. Senator REED. Dr. McQueary, your prepared testimony says, "There is still a long way to go" with respect to testing of the BMD system. What do you mean by that, and what else remains to be done?

Dr. MCQUEARY. The BMDS is probably the largest, most complex combat system in the DOD. The many components—sensors, shooters, and C2BMC—are at different levels of development and maturity. The many sensors, ground and satellite based, are in various aspects of development, modification, and testing. Patriot is fully operational and fielded. Aegis BMD has a capability primarily limited by the number of modified cruisers. The Terminal High Altitude Area Defense system is still early in its developmental test program but is showing rapid progress. The GMD system has had one flight test of the production booster and kill vehicle that ended with an intercept of a threat-representative target. C2BMC is still in the early stages of development. Many more tests of these elements and their integration into the BMDS must be accomplished to demonstrate repeatability, anchor models and simulations, and build confidence. That's why I stated "There is still a long way to go" with respect to testing the BMDS.

STATUS OF PREVIOUS GAO RECOMMENDATIONS

47. Senator REED. Mr. Francis, your report states that DOD has not implemented all your previous recommendations on missile defense acquisition. Which recommendations has DOD not implemented, and what effect do you believe that has had?

Mr. FRANCIS. From March 2005 through the issuance of our latest missile defense report in March 2007, we made nine recommendations and MDA has not yet implemented them. These recommendations propose that MDA:

- adopt a knowledge-based acquisition strategy consistent with those called for in DOD acquisition regulations,
- assess whether a 2-year block strategy is compatible with a knowledge-based acquisition strategy,
- clarify and modify block policy to align cost and fielding goals,
- adopt more transparent criteria for identifying and reporting significant changes in MDA's goals,
- develop baselines for all elements effectively in the system design and demonstration phase of the acquisition cycle,
- provide information to Congress that is consistent with the spirit of acquisition laws that govern baselines, unit cost reporting, independent cost estimates, and operational test and evaluation,
- include in blocks only elements that will field capabilities during the block,
- request procurement funds to acquire operational assets, and
- conduct an independent evaluation of the Airborne Laser and Kinetic Energy Interceptor programs prior to deciding their futures.

Our recommendations were meant to make the Ballistic Missile Defense (BMD) program's decisions and actions more transparent, to hold the program more accountable for the funds it receives and the actions it takes, and to enable better oversight. Without change, we continue to see the same problems. The scope of a block is not firm but changes annually, making it difficult to determine what each block will deliver. Cost issues make it impossible to compare the value of a block to its cost. For example, block costs cannot be determined because work that cannot be completed during one block is pushed into a future block, along with its cost. Neither can an operational asset's unit cost be identified because assets are being acquired piecemeal over a number of years. Additionally, unit cost growth is hidden since a unit cost estimate is not established at the time funds are first requested and there is no base with which an asset's actual cost can be compared. We also continue to see MDA stray from the knowledge-based approach that allows successful developers to deliver, within budget, a product whose performance has been demonstrated. Instead, MDA continues to field assets before their capability is known.

MDA BLOCK SCHEDULE SYSTEM

48. Senator REED. Mr. Francis, the MDA's 2-year block management approach is confusing, and doesn't seem to have clear meaning, especially since MDA can change the scope and schedule of what is in any given block. From your standpoint, does MDA's 2-year block structure help or hurt from an accountability and oversight standpoint?

Mr. FRANCIS. MDA's 2-year block management approach does reduce program accountability and make oversight more difficult. MDA has found that 2 years is not always enough time to complete all of the work planned for a block. For example, the Ground-based Midcourse Defense (GMD) element reported at the end of Block 2004 that not all planned work was completed. According to GMD officials, this work was deferred until Block 2006 and its cost is being recognized as a cost of Block 2006. However, the officials could not tell us how much of the Block 2006 budget is attributable to the deferred work. The result is that the cost of Block 2004 is understated and the cost of Block 2006 is overstated. In addition, if MDA delays Block 2006 work until Block 2008, as expected, Block 2006 cost will become more difficult to compare with its originally estimated cost as the cost of the deferred work will no longer be considered a Block 2006 cost. While the block concept is a useful construct for harvesting and fielding capability incrementally, it is a muddy concept for accountability. Additionally, as work travels from one block to another, the connection between the actual cost and scope of work completed and the estimated cost and scope of work used to justify budget requests is weakened, making it difficult for decision makers to determine the value of the investment being made in missile defense. The block management approach does focus management on the system-of-systems level, which facilitates making decisions that cross traditional program lines. This makes it possible for MDA to have more options as to how to meet a requirement, and could reassign a requirement from one element to another if conditions warranted. We believe that this system-of-systems or portfolio perspective for managing and making decisions is good. However, we also believe that this perspective can be maintained while at the same time providing the same or nearly the same level of transparency, accountability, and oversight as other major weapon system programs. This has been the aim of our recommendations for the revisions being considered for MDA's block approach.

PATRIOT PURE FLEET INITIATIVE

49. Senator REED. General Campbell, I understand that the Army Chief of Staff included the Patriot PAC–3 Pure Fleet initiative as a high priority on his fiscal year 2008 Unfunded Priorities List submitted to Congress. I gather that implementing the Patriot Pure Fleet initiative would provide all Patriot battalions with the latest PAC–3 capabilities. Can you provide a description of the benefits of upgrading all Patriot battalions to this enhanced PAC–3 configuration?

General CAMPBELL. Patriot Advanced Capability–3 (PAC–3) provides significant increase over Configuration–2 in every key measurable capability-increased range and fidelity for surveillance and target identification, increased probability of kill, and larger defended area. The Configuration–3 Radar provides substantial surveillance improvement. The Configuration–3 Radar can detect a "basketball size" object versus a "pick-up truck size" object for the Configuration–2 Radar. The Configuration–3 Radar is able to discriminate debris and decoys from actual targets which equates to higher probability of kill and less missile expenditure. The PAC–3 Launcher uploads 4 times the number of missiles and fires the PAC–3 missile which provides increased lethality through Hit-to-Kill technology able to defeat submunitions and Weapons of Mass Destruction (WMD). Configuration–3 also provides a 7-fold increase in battlespace resulting in a greater defended area and allows remote launch capability three times farther than Configuration–2 and significantly extends the Tactical Ballistic Missiles footprint. Pure Fleeting the Patriot force will increase the size of the pool of deployers and increase our Nation's strategic flexibility against the Tactical Ballistic Missile threat.

50. Senator REED. General Campbell, if fiscal year 2007 and fiscal year 2008 funds are approved for this initiative, what capability enhancements to missile defense capabilities would be realized?

General CAMPBELL. Yes. Patriot is our Nation's only fielded ground-based tactical BMD weapon and is a strategic asset with implications in multiple theaters overseas. Improving our Nation's tactical BMD capability is needed to support the combatant commanders. The Army is committed to funding the PAC–3 Pure Fleeting of the remaining three Configuration–2 capable battalions. The current strategy in-

volves a combination of reprogramming from the fiscal year 2007 main budget to complete the pure fleeting action. Additionally the Army intends to utilize "Grow the Army" funds to create two additional PAC–3 battalions. At end state, Patriot Pure Fleet and growth of the PATRIOT force will provide 15 PAC–3 battalions enabling greater strategic flexibility of our Nation's missile defense forces while reducing the stress on the Patriot force.

51. Senator REED. General Campbell, as the Army's senior missile defense commander, do you support additional funding for the Patriot PAC–3 Pure Fleet initiative?

General CAMPBELL. Yes. Patriot is our Nation's only fielded ground based Tactical BMD weapon and is a strategic asset with implications in multiple theaters overseas. Improving our Nation's tactical BMD capability is needed to support the combatant commanders. The Army is committed to funding the PAC–3 Pure Fleeting of the remaining three Configuration–2 capable battalions. The current strategy involves a combination of reprogramming from the fiscal year 2007 main budget to complete the pure fleeting action. Additionally the Army intends to utilize "Grow the Army" funds to create two additional PAC–3 battalions. At end state, Patriot Pure Fleet and growth of the Patriot force will provide 15 PAC–3 battalions enabling greater strategic flexibility of our Nation's missile defense forces while reducing the stress on the Patriot force.

CURRENT NATO POSITION ON MISSILE DEFENSE

52. Senator REED. Mr. Green, the NATO Secretary General indicated that NATO has decided to pursue missile defense for its deployed military forces, but not its territory and its population. Is that correct, that NATO has not decided to defend its territory or its population?

Mr. GREEN. NATO has taken no decision on whether to pursue territorial missile defenses against long-range ballistic missiles but has been examining the feasibility of such defenses. The focus of NATO and NATO Allies to date has been on missile defenses to address the shorter-range ballistic missile threat. NATO agreed to develop and deploy the active Layered Theater BMDS, where Alliance members' theater missile defense systems will be integrated using the NATO Air Command and Control System as the command and control backbone for deployed terminal missile defense systems, resulting in a financial commitment by the Alliance of approximately $800? million. NATO completed a study in 2006 on the feasibility of a NATO defense for European population and territory from long range missile attack. This study concluded that such a defense is feasible. As a result of the 2006 feasibility study, NATO is currently assessing the political and military implications of such a defense. It recently modified this effort to account for the deployment of U.S. missile defense assets in Europe.

53. Senator REED. Mr. Green, so in that context, is it accurate to say that the U.S. proposal to deploy a territorial missile defense system in Europe goes beyond the current NATO position?

Mr. GREEN. NATO has not made a decision yet to pursue a NATO-funded defense against long range ballistic missile threats. However, NATO, to a large degree, has a common understanding of the growing ballistic missile threat. NATO recognizes and accepts the U.S. approach of negotiating bilaterally with Poland and the Czech Republic. NATO also accepts missile defense as a reasonable approach to the missile threat, as evidenced in their efforts to field missile defense to address short and medium range threats. NATO demonstrated that it recognizes and accepts the reality of the U.S. missile defense deployment in Europe by agreeing recently to consider the U.S. site in its ongoing study.

QUESTIONS SUBMITTED BY SENATOR MARK PRYOR

MISSILE DEFENSE TESTING

54. Senator PRYOR. General Obering, the MDA uses the integration of technologies to create an overwhelming advantage against enemies who would use ballistic missiles to threaten the national security of the United States. The recent missile defense intercept test (April 6) for the THAAD interceptor successfully demonstrated beyond-line-of-sight communications and radar tracking/target discrimination objectives. While I'm sure you would agree with me that the missile defense program is quite expensive, costing $2 billion a year to operate, what further bench-

marks are there in the future to validate the operational capability of the program? What challenges still lie ahead?

General OBERING. In partnership with DOT&E and the warfighters, MDA continues to test the operational capability of the BMDS using a campaign of digital simulation, ground tests (Hardware-in-the-Loop) and flight tests. Our test program characterizes existing fielded capability, integrates and demonstrates new capabilities, and allows warfighters to test and validate their tactics, techniques, and procedures in a near-operational environment.

In the first category of characterizing existing fielded capability, MDA's fiscal year 2007 test program will demonstrate (benchmark) the BMDS:

- GMD end-to-end intercept engagement that uses the operational system hardware and software;
- Aegis BMD's operational capability as both a sensor supporting homeland defense and its engagement capability to defend deployed forces, friends and allies;
- Deployed AN/TYP–2 X-band radar (formerly Forward Based X-band Radar) at Shariki, Japan, to support defense of the homeland, our deployed forces and the country of Japan;
- Integrated capability of the SBX radar to support homeland defense against missile attack from North Korea;
- Defense of Fylingdales Upgraded Early Warning Radar against a possible Iranian missile attack.

In 2008 MDA will begin testing the THAAD element of BMDS in its fielded configuration, testing advanced discrimination algorithms for our forward-based radars, software upgrades to the BMDS Battle Management and GMD components to optimally use multiple sensor data inputs, and a new capability to concurrently perform developmental tests, operator training, and maintain an operational capability. As the BMDS continues to grow in complexity and inventory with additional operating locations for sensors and shooters and an evolving threat, the MDA test program will keep pace through a disciplined process that validates fielded capability and provides the data needed to guide the continued development of our capability to defend against ballistic missile attack.

The magnitude of managing a complex test program and integrating the operational components into the BMDS is the MDA's greatest challenge. Years before the actual test can take place each test must be planned both at the Element level and the BMDS level: target requirements must be developed and targets must be procured, test objectives must be defined and the test itself must be designed with pre-test analysis performed by a dedicated test organization composed of system and test engineers. In conjunction, current year test programs must be conducted and the results analyzed and compared with system specifications. Based on the analysis, decisions on possible system changes must be made and the information on the operating BMDS passed to the warfighter. The MDA has developed an effective process that enables efficient management of the established benchmarks that will validate the operational capability of the program.

55. Senator PRYOR. General Obering, on March 15, a modified Boeing 747–400F carrying a YAL–1A Airborne Laser (ABL) successfully test fired its target illuminator laser against a NC–135E test aircraft, verifying its ability to identify, track, and intercept an airborne target in the boost phase of flight. Could you better clarify this boost phase defense segment?

General OBERING. The ABL is the primary Boost Defense Segment of the MDA's integrated and layered BMDS. The MDA will design, build, and test an air-based laser system to acquire, track, and kill ballistic missiles during the boost phase of missile flight. The boost phase typically includes the first 60–300 seconds of missile flight and concludes at altitudes between 20–450 kilometers.

Adding the ABL to the BMDS significantly increases the overall defensive capability by reducing the number of targets faced by successive defenders and by addressing certain threats that may be difficult to counter. By destroying the missile in boost ABL also negates the threat prior to their ability to deploy multiple reentry vehicles, submunitions, or countermeasures. Additionally, warheads and engagement debris do not reach the intended target areas. Furthermore, there is a high probability that the threat missile debris will fall within the hostile country's own territory, serving as a deterrent and reducing the possible affect the debris has on protected areas and assets.

Secondary missions, for an operational ABL, will be to provide additional threat protection through early ballistic missile launch warning, launch site prediction, cueing to BMDS, and impact point prediction. Detecting and tracking a missile dur-

ing its boost phase significantly improves accurate estimation of the launch point location and therefore will enhance the probability of a successful counterstrike against an aggressor's missile launchers. ABL's sensor capabilities further increase the robustness of the BMDS by enhancing the performance of other elements.

In addition, the unique, revolutionary capabilities of ABL's mobility and speed-of-light directed energy weapon present adversaries with additional complexities when trying to develop or employ threat missile countermeasures that will provide a credible deterrent and a lethal defense against a rapidly evolving ballistic missile threat. ABL adds unique deployment flexibility to quickly deploy to areas of interest arriving in theater ready to provide an initial deterrent and defensive capability for the United States and/or allied forces. Without ABL, MDA would have to address in much less viable ways both the further proliferation of threats that is expected and the likely adversary counters to the other BMDS elements.

56. Senator PRYOR. General Obering, how does a 747–400F tactically anticipate and respond to an adversarial launch?

General OBERING. The ABL responds to an adversarial launch by detecting the launch with its on-board Infrared Search and Track (IRST) sensors, autonomously or with the assistance of cues from other BMDS sensors (e.g., satellites). The IRSTs detect the unique heat signatures emitted by the exhaust plumes of boosting missiles, and provide the information needed to point the turret and engage the threat missile with its High-Energy Laser. ABL is able to operate autonomously, however in normal operation it will interact with C2BMC, which will determine which shots are to be taken by ABL. ABL's concept of operations involves flying a combat air patrol pattern near a predetermined area of interest, detecting threat launches anywhere within its 360-degree field of regard, and rapidly engaging and destroying threat missiles. In addition, ABL's forward-deployed location will allow it to provide critical early launch warning to the rest of the BMDS.

57. Senator PRYOR. General Obering, what significance does this test have on the overall missile defense program?

General OBERING. This test was part of a critical series of in-flight tests of the ABL's laser targeting system and showed ABL's ability to identify, track and lock onto an airborne target precisely enough to hit it with the Tracking Illuminator Laser (TILL). The TILL is a kilowatt-class solid-state laser that is intended to track a boosting ballistic missile and identify the most vulnerable location on the missile in preparation for the eventual firing of the High Energy Laser, which will use directed energy to burn through the rocket motor case of a hostile missile.

This test was an important step toward our next goal of determining atmospheric distortion between ABL and the target, compensating for that distortion, and engaging the target with a Surrogate High Energy Laser by this summer. In terms of the entire missile defense program, adding the ABL to the Boost Defense Segment of the BMDS significantly increases the overall defensive capability of the BMDS by reducing the number of targets faced by successive defenders and by addressing certain threats that may be difficult to counter during later stages of flight. Moreover an operational ABL, will be able to provide additional threat protection through early ballistic missile launch warning, launch site prediction, cueing to BMDS, and impact point prediction. Detecting and tracking a missile during its boost phase significantly improves accurate estimation of the launch point location and therefore will enhance the probability of a successful counterstrike against an aggressor's missile launchers. ABL's sensor capabilities further increase the robustness of the BMDS by enhancing the performance of other elements.

58. Senator PRYOR. General Obering, the PAC–3 surface-to-air missile is manufactured at the world class, highly-automated production plant in Camden, Arkansas. In 2006, this facility won the Arkansas Institute for Performance Excellence Governors Award and was named one of the "10 best" plants in America for its outstanding track record of on-time, on-budget deliveries of quality systems. What significance has the PAC–3 had on the Integrated BMDS and how important is the PAC–3 manufacturing and depot facility in Camden?

General OBERING. I will defer to the Army to address the importance of the PAC–3 manufacturing and depot facility in Camden. My role is to manage configuration updates to ensure they are fully integrated and interoperable with the BMDS.

As a fielded system, PAC–3 is already a significant contributor to the protection of U.S. Forces, friends and allies for the Combatant Commanders. In the future, we expect the Army's PAC–3 to continue these roles as other systems introduce additional layers of protection to our integrated BMD.

59. Senator PRYOR. General Obering, on January 11 of this year, China launched a successful strike against its own Feng Yun (FY–1C) polar orbit weather satellite using a Kinetic Energy Anti-Satellite weapon. What impact has this action made on our strategic capabilities posture?

General OBERING. [Deleted.]

PROTECTION FROM THEATER THREATS

60. Senator PRYOR. General Campbell, in your statement you note that "Operation Enduring Freedom and Operation Iraqi Freedom are consuming key missile defense capabilities, leaving other worldwide commitments under-resourced." What steps are we taking to ensure the U.S. homeland and our troops deployed in combat are protected from theater air and missile threats?

General CAMPBELL. The MDA has increased fielding of GBIs in Alaska and other capabilities, and is developing a European-based capability. For deployed forces, Strategic Command provides input to the Global Force Management Board to optimize distribution of limited air and missile defense forces around the globe. Of course, we understand that the threat to the homeland is from long range or intercontinental missiles, while our deployed soldiers are facing threats from short or intermediate range missiles. The systems we have deployed are effective against these particular threats. We are continuing to evolve our existing systems and field new systems such as the Terminal High Altitude Area Defense (THAAD) which will enhance our capabilities against the full range of missile threats.

INTELLIGENCE, SURVEILLANCE, AND RECONNAISSANCE

61. Senator PRYOR. General Campbell, what are your thoughts on our functional components for intelligence, surveillance, and reconnaissance (ISR)? Do we have adequate ISR ground, naval, and airborne platforms supporting the global war on terrorism and intelligence gathering efforts worldwide?

General CAMPBELL. As a Department, we effectively meet less than one third of our combatant commanders' warfighter information needs. We do not have sufficient capabilities or capacity to meet the Nation's demand for intelligence. There are two ways to approach this. First, better integrated and focused investments to alleviate gaps and shortfalls in ISR near- and far-term. Today we face adversaries who avoid our strengths and seek to attack through nontraditional means. The current ISR enterprise, designed to confront the former Soviet Union and the Warsaw Pact, isn't optimized for either collection against, or analysis of, these new adversaries. Second, assess how we as a nation are running the ISR Enterprise today and aggressively make the changes required to improve efficiency and effectiveness.

DETERRENCE CAPABILITY

62. Senator PRYOR. Mr. Green, our Nation's global deterrence capability enables the United States to have decisive kinetic combat effects through the application of worldwide space and global strike operations. Meanwhile, the threat of global terrorism, highlighted by ballistic missile proliferation from countries like North Korea and Iran, poses a great challenge to our national security. With the threat from the numbers and capabilities of ballistic missiles increasing, what is our overall strategy to defend and counter this proliferation?

Mr. GREEN. The U.S. Government has a number of initiatives underway to halt or counter the proliferation of ballistic missiles. We use multilateral frameworks, such as the Missile Technology Control Regime, to prevent the proliferation of ballistic missile technology. We also apply rigorous export controls and, where necessary, sanctions to keep ballistic missiles out of the hands of dangerous regimes. We place a high priority on dissuading or stopping potential adversaries from obtaining ballistic missile technology in the first place.

Should regimes evade our efforts, we rely on the full array of deterrent capabilities, including missile defenses. Missile defenses devalue an adversary's investment in ballistic missiles and complicate the enemy's strategic calculations by increasing the uncertainty that a ballistic missile attack will be successful. When combined with U.S. offensive strike capabilities, U.S. leaders have a range of options for deterring, defending against and defeating potential missile attacks.

QUESTION SUBMITTED BY SENATOR JEFF SESSIONS

MISSILE DEFENSE TESTING AND CONTINUED FIELDING

63. Senator SESSIONS. Dr. McQueary, MDA plans to emplace four new GBIs in fiscal year 2008, and six new interceptors each year from fiscal year 2009 through fiscal year 2012. Based on your assessment of the testing program thus far, is there any reason why these GBI emplacements should not go forward?

Dr. MCQUEARY. There is obvious risk in producing new interceptors while the test program is ongoing. Following the two consecutive GMD flight test failures in December 2004 and February 2005, General Obering stopped testing and fielding until the results of several independent reviews he commissioned were complete. He then adopted a deliberate "test-analyze-fix-test" philosophy that I fully support. Although the August 2006 GMD flight test was a success, it is only one test. Repeatability is a very important element of a successful program. The next two GMD flight tests, if successful, will bolster my confidence that GMD can repeatedly demonstrate capability in increasingly more demanding scenarios. At this time, I see no reason to stop emplacing interceptors at Fort Greely or Vandenberg AFB.

[Whereupon, at 5:01 p.m., the subcommittee adjourned.]

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2008

THURSDAY, APRIL 19, 2007

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

MILITARY SPACE PROGRAMS

The subcommittee met, pursuant to notice, at 2:30 p.m. in room SR–232A, Russell Senate Office Building, Senator Bill Nelson (chairman of the subcommittee) presiding.

Committee members present: Senators Bill Nelson, Inhofe, Sessions, and Thune.

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

Minority staff member present: Robert M. Soofer, professional staff member.

Staff assistants present: Kevin A. Cronin and Micah H. Harris.

Committee members' assistants present: Clyde A. Taylor IV, assistant to Senator Chambliss; and Stuart C. Mallory and Jason Van Beek, assistants to Senator Thune.

OPENING STATEMENT OF SENATOR BILL NELSON, CHAIRMAN

Senator BILL NELSON. Good afternoon, thank you for coming. We have a number of witness so I'm going to make some very brief remarks, and when Senator Sessions gets here, I will interrupt the proceedings and ask him to make his comments.

We are here on the occasion that the Department of Defense (DOD) certainly relies on a lot of space systems. We're in the process of modernization and replacement and it is putting a strain on the budget as well as the technical and management skills of the Services and the contractors. While some of these programs have made progress in resolving some of the schedule and budget issues, a lot of work remains. So we want to dig into that.

We have a star-studded cast, literally and figuratively. I'm just going to curtail my comments there. I will interrupt when Senator Sessions gets here, but your statements will be made a part of the record. What I would like to do, instead of your reading a statement to me, which we can, of course, read that for ourselves, is to have a conversation.

[The prepared statement of Senator Bill Nelson follows:]

PREPARED STATEMENT BY SENATOR BILL NELSON

Good afternoon and welcome to the Strategic Forces Subcommittee hearing on military space systems. We have an excellent panel of witnesses today, Dr. Sega, Under Secretary of the Air Force and the Executive Agent for Space for the Department of Defense (DOD); General Chilton, Commander, Air Force Space Command; General Shelton, Commander, Joint Forces Component Command for Space, U.S. Strategic Command; Vice Admiral McArthur, Commander, Navy Network Warfare Command; and Cristina Chaplain from the Government Accountability Office. Thank you all for being here. We look forward to a good discussion of military space programs.

DOD is heavily reliant on space systems, as is the United States in general. Currently, all of the DOD military space systems are in the process of modernization and replacement, which is putting a strain on the budget as well as the technical and management skills of the Services and the contractors. While some of these programs have made progress resolving some of the schedule and budget issues, a lot of work remains, particularly in technically challenging programs such as T-sat. On the other hand, there is good progress in the Operationally Responsive Space program and even the Space-Based Infrared Satellite program.

Programs dealing with space situational awareness, an area generally under-appreciated and perpetually under-funded, are back in the spotlight as a result of the Chinese test of a kinetic anti-satellite weapon. While it is it not clear if China will or will not deploy such a weapon, the test, which created thousands of pieces of space debris, was at a minimum, a loud wake-up call.

Another critical element of the national security space programs is space launch. It is important that we continue to maintain and modernize the launch ranges to ensure reliable access to space.

We have a large number of witnesses this afternoon and you all have submitted prepared statements, which, without objection, will be included for the record. In order to make the best use of our time I will limit my opening remarks and now turn to Senator Sessions for any opening remarks that he may have.

Senator BILL NELSON. So, Mr. Secretary, we'll start with you.

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

Dr. SEGA. I'm appearing before you today as both the Under Secretary of the Air Force and the Executive Agent for Space.

When we talked last year, we talked about three themes that we were going to work on: integration across space, as well as across functions and organizations, not only within the DOD, but with agencies outside, as well as industry, universities, and Congress. We also talked about a back-to-basics approach toward acquisition and a block approach to organize ourselves so that we would be reducing risk in our acquisition programs to deliver to the warfighter on time and on cost. The third area was workforce.

In addition to that, I want to talk a little bit about continuity of service that we think is very, very important for several of the activities we're engaged in. One of those is missile warning. We can not afford to have a gap in our sensing capability for missile warning for the United States. The second is strategic communications. The third is position, navigation, and timing—our Global Positioning System (GPS).

We've also endeavored to increase our activities as we go forward in both space situational awareness and operationally responsive space (ORS), and recall, and I'll refer to this chart in the back, how we have organized.

As we look at the acquisition process, we're looking at it in four stages. At the top of the charts is our System Production Stage. There, we are lowering the risk, shortening the acquisition cycle-

time that is indicated by these arrows block one to block two, et cetera, we go horizontally.

The next generation out from that is Systems Development. We want to be maturing the technology so when it reaches the System Production phase, it is mature; do the systems engineering correctly; look at the requirements—make sure they are identified clearly; apply the resources; and then, go from there. One generation still further out is Technology Development, and one further out, is Science and Technology.

As an example of how we would go through this: in our budget, we have submitted GPS III for funding throughout the Future Years Defense Program (FYDP). GPS IIIA follows on GPS IIF. It enhances the capability in two major ways: one is adding a new frequency, L1C, for the civil community and something our Nation says we're going to do—it's also compatible with Galileo. It also adds additional power that our warfighters, through the Joint Requirements Oversight Council (JROC), say is very important. So, we will have 10 times the power over our GPS IIF signal strength in GPS IIIA.

We're also anticipating where we need to go for IIIB and IIIC. We're adding a growth-path requirement into the building of IIIA. This has been done through the JROC process. We understand the requirements—the technologies are matured—and we're going forward on IIIA.

Along with that, we want to be anticipating IIIB. The major piece of technology and capability for IIIB is cross-links—higher rate cross-links that tie the system together to improve accuracy. So, we need to be working on that in a systems development phase, and bring that to at least a TRL Level 6 capability.

We also know, after IIIB, that we're going to be looking at IIIC. That would include a spot beam, but that's less mature at this time. We need to be working on the technology development for a spot beam, so in time, it moves up to Systems Development and finally can add to the GPS capability and become GPS IIIC. We're investing in science and technology (S&T) in such things as advanced clocks for our GPS system.

So, we have an "investment portfolio" established, not only in what we are building today, but also in what we have in the future to continue to enhance the capability. That's consistent with the rate of change of the 21st century—continuing to bring on technology improvements for the new needs of the warfighter. But, it will be done in blocks. It is a more disciplined approach, requiring more adherence to systems engineering, and to standards. Our folks are more in plant now and working with the user from day one. So, that's how this back-to-basics and block approach works for the GPS III satellite.

If we go on to the Space-Based Infrared System (SBIRS) Satellite that supports missile warning—we need a continuity of service capability plan for warning. After we complete the SBIRS Geo-satellite—what is next? In our budget is the Alternative Infrared Satellite System (AIRSS). Focal plane technology is increasing, it's the 21st century way of staring and getting the information from space in the infrared spectrum we need. This information supports not only missile warning, but also missile defense, technical intel-

ligence, and battle-space characterization. So, that's why we have AIRSS also in the budget, as well as SBIRS GEO.

This last year, we were pleased to report the SBIRS HEO payload was on orbit and exceeding our expectations. That's been a good thing.

We're also focusing on mission assurance from day one. One example of that is launch. On March 8, we witnessed our 50th consecutive, successful, medium or heavy national security launch—a great job from the team that has put that together. But, for each one, we have to keep our eye on the ball and make sure attention to detail is maintained.

I do want to highlight for that particular launch, there were five firsts. Not only was it the 50th, but it was the first Air Force and DOD Atlas V mission; the first multiple payload mission; the first Centaur-3 burn mission; first flight of the Evolved Expendable Launch Vehicle (EELV) secondary payload adapter, allowing smaller satellites the opportunity to fly; and the first flight of a dual orbit trajectory that went off first at 44 degrees inclination and then over to 35 degrees inclination. So, I really think that's important.

The final point is that of workforce. We put forward a National Defense Education Program 3 years ago. We doubled the money that was in that last year and we ask, once again, to double the funds this year. This program focuses on science, math, engineering, and some foreign language for the critical skills that we need for clearable people. So, its focus is on the pipeline coming forward.

General Chilton and company have worked hard on the National Security Space Institute (NSSI), which you may hear about later. Our workforce is key and foundational to us being successful going forward. I just want to thank this committee for your support of what we're doing in National Security Space.

[The prepared statement of Dr. Sega follows:]

PREPARED STATEMENT BY HON. RONALD M. SEGA

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 (NSS) 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 NSS 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 eco-

nomic efforts as well. Because of this, it is important that 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 radios, incorporating global positioning system (GPS) and satellite communications (SATCOM).

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 percent of the SATCOM used in U.S. Central Command's area of responsibility. 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 NSS operational launch—a national record. This event was also the 15th successful operational launch of an evolved expendable launch vehicle 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-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, plus the necessary ground elements.

Communications

We are moving ahead with near-term improvements to our SATCOM 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 program, the follow-on to MILSTAR, successfully com-

pleted 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 SATCOMs (TSAT) program continued to mature key technologies with both contractors passing independent evaluations.

Position, Navigation, and Timing

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

Operationally Responsive Space

In 2006, the Air Force established the new Space Development and Test Wing, headquartered at Kirtland Air Force Base (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 NSS 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 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, headed by the 14th 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 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 National Aeronautics and Space Administration (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 percent confidence level, to help ensure space program success.

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

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

Though "Back to Basics" is not a quick-fix solution to space acquisition, we have begun to realize the benefits of using this approach. Adhering to its key principles (e.g., systems engineering; proper management of requirements, risks, and resources) yields dividends, but this is a continuing process that requires our continued commitment. In the fiscal year 2007 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)); SSA (e.g., Space-Based Surveillance System (SBSS)); and Position, Navigation, and Timing (e.g., GPS III). Thus, programs with defined, executable block strategies should reduce production risk, deliver incremental capabilities to the warfighter sooner, and maintain continuity of service.

Missile Warning

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

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

Communications

Last year, we also applied the "Back to Basics" approach to Strategic Communications programs, particularly for the Transformational Communications Architecture

(TCA) and the TSAT program. The TCA supports interoperability through the use of community standards and is comprised of four segments: space vehicles, terminals, terrestrial infrastructure, and network management & operations.

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

Position, Navigation, and Timing

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

The Air Force is meeting the warfighters' PNT needs through increased power and signal improvements to 8 GPS IIR–M satellites (3 on orbit and 5 awaiting launch), 12 GPS IIF satellites, their ground control system, and associated user equipment. Together, these actions will deliver higher power and improved anti-jam capability. At the same time, the Air Force is developing the GPS III satellites to continue to satisfy warfighter requirements in the future.

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

Operationally Responsive Space

ORS also utilizes the "Back to Basics" approach. As defined in this year's Air Force Posture Statement, "ORS includes the ability to launch, activate and employ low-cost, militarily useful satellites to provide surge capability, reconstitute damaged or incapacitated satellites, or provide timely availability of tailored or new capabilities." A broader view of ORS is a tiered capability consisting of spacecraft, launch vehicles, and ground segment to deliver a range of space effects to the warfighter. Additionally, this broader view combines existing, ready-to-field, and emergent systems that are focused on reducing development and deployment costs and schedule. The fiscal year 2008 funding request for the ORS program element (narrower, small-satellite construct) supports an increased ability to transition rapidly from experiment to operational capability.

Our first on orbit Tactical Satellite Experiment (TacSat-2) was successfully launched in December 2006, and two more experimental "TacSats" are planned for launch in 2007. The TacSat-2 satellite was developed quickly and cost effectively—carrying several experiments to test cutting-edge capabilities to support the warfighter. The TacSat-2 team demonstrated "responsive" capabilities by efficiently integrating the satellite and launching on a Minotaur booster (Minuteman derivative) within 7 months of ordering the booster.

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 fiscal year 2007 that detect and geo-locate SATCOM interference via fixed

and mobile ground systems, whereas Block 20 is planned to provide automated data access/analysis, data fusion, and decision support capabilities.

The Space Fence is planned to replace the aging Air Force Space Surveillance System (AFSSS) with a system of three sites worldwide and use a higher radio frequency to detect and track smaller sized space objects. It would expand the terrestrial-based detection and tracking capability, supporting SSA while working in concert with other network sensors. A block approach acquisition strategy for the program will be developed in fiscal year 2007–2008 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 fiscal year 2009 as a pathfinder capability to replace the aging SBV sensor. Block 20 is then scheduled to provide increased worldwide space surveillance.

SPACE PROFESSIONALS/SCIENCE AND ENGINEERING WORKFORCE

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

The importance of space as a force multiplier underscores the necessity to ensure we have a strong industrial base that will be able to satisfy our requirements, both now and in the future. The Space Industrial Base Council, 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 multi-service 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 SATCOM. 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 $10 million in fiscal year 2006, $20 million in fiscal year 2007, and we are requesting $44 million in fiscal year 2008. 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 NSS.

Senator BILL NELSON. Thank you.

General Chilton?

STATEMENT OF GEN. KEVIN P. CHILTON, USAF, COMMANDER, AIR FORCE SPACE COMMAND

General CHILTON. Thank you, Mr. Chairman, distinguished member of the subcommittee. I really appreciate the opportunity to appear before you today. It's a great opportunity.

Senator Sessions, thank you as well. It's a privilege for me to be here, just to be here and visit with you all. But, also to represent the nearly 40,000 men and women of Air Force Space Command, who today are in the fight globally, supporting the global war on terror and also providing for the national security of this country, day-in and day-out. Those wonderful folks are out every day, 365 days a year, delivering critical space and nuclear deterrent capabilities to us.

If I could share with you, just briefly, the four priorities that we have in Space Command that were the backbone for our program this year, and as we look to the future.

First, we want to make sure that we preserve and expand the critical capabilities that we bring to the joint warfighter. Preserve means take care of what you have, fund it correctly, and develop the space situational awareness we know we will need for the future to preserve our capabilities. Expand was detailed by Dr. Sega, as we are recapitalizing, along with the Chief's vision, every single one of our key constellations in this program, I'm very proud of that.

I don't think we can say it often enough, that we don't do things in space just for the Air Force. Everything we do is in support of the joint warfighter and I'm very proud of that.

Our second priority is to make sure we provide a safe and secure nuclear deterrent for the United States of America. I tell my team, we juggle a lot of balls everyday, most of them are tennis balls. One of them is a crystal ball and that's our nuclear responsibilities. We cannot afford to take our eye off that ball or to drop it. We take it very seriously and you'll see that in the recapitalization and refurbishing of our Minuteman III fleet from nose cone to rocket nozzle. We're preparing to extend that fleet to 2030.

The third priority for us is to make sure that we develop, mature, and field and sustain, on time and on cost, the capabilities we'll need for the future. In Air Force Space Command, we uniquely have the acquisition arm, the Space and Missile Center, out in Los Angeles assigned to this operational command. So, we take that responsibility very seriously. I'm proud to announce that General Hamel and his team out there have done a great job, I think, in turning the ship on acquisition for our space business. In fact, taking us where we need to go into the future.

Last, but certainly not least, our priority is to make sure we attract, train, and retain the expertise we're going to need for the 21st century as we move forward into a more complicated environ-

ment in space and in warfighting. So, we're very focused through not only institutions like the NSSI, but we're taking a hard look at policies for recruiting. We're taking a hard look at how we raise people to key leadership positions for the future. We want to make sure we do that with malice and forethought, as we grow our space leaders within the Air Force for the future.

These are our four priorities and they've shaped this budget submission to you.

Again, sir, I thank you for the opportunity to be here and I look forward to your questions and questions from the subcommittee.

Thank you very much.

[The prepared statement of General Chilton follows:]

PREPARED STATEMENT BY GEN. KEVIN P. CHILTON, USAF

INTRODUCTION

Mr. Chairman 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 my distinguished colleagues, all great leaders of 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 AFSPC 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 (SATCOMs), Space Launch and Counterspace capabilities. As we reflect on the contributions the airmen in AFSPC 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 Air Force Space," General "Bennie" Schriever and the first Commander of AFSPC, General James Hartinger. The long line of great leaders up through my predecessor, General Lance W. Lord, (Ret.), 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 im-

portantly, to ensure 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 AFSPC 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 (SSA). Breaking this down further we arrive at the key ingredients necessary to achieve the SSA 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 decisionmaking 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, AFSPC made progress in all of these areas.

We solidified our support to United States Strategic Command (USSTRATCOM) with their assignment of Major General Willie Shelton, our 14th Air Force Commander, as USSTRATCOM's Joint Functional Component Commander for Space (JFCC–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 the Central Command (CENTCOM) alone, in the Combined Air and Space Operations Center in Southwest Asia, the Director of Space Forces received direct support from Major General 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, AFSPC's worldwide space tracking and surveillance network provides positional data on over 16,000 space objects. Our expert team of orbital analysts used this data for satellite collision avoidance with space debris as well as with other satellites. This analysis, in turn, helped safeguard over $50 billion in U.S. 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 1,600 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 (MDA) 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 (SBSS) system. On the heels of MSX are the SBSS Block 10 (launching in fiscal year 2008) 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 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 SSA 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 SSA, 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 Joint Functional Component Commander for Space (JFCC–SPACE) with the SSA he requires to effectively plan, operate, and fight is our top concern.

To address this concern, we are driving towards several significant milestones. In fiscal year 2008, we will create an Integrated SSA 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 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 SSA needs.

While SSA 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 se-

curity 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, eight National Aeronautics and Space Administration, seven Department of Defense (DOD), one commercial, and six 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 AFSPC.

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 the best in the world, 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 U.S. 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 (GMLRS) 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 SATCOM 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 worldwide, 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, 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 DSCS constellation (nine 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) SATCOMs 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 SATCOMs 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″ × 10″ 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, Military SATCOM (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 ex-

ceeded 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 SSA 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 Tactical Satellite (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 AFSPC 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.

The Commander, USSTRATCOM has identified a need to strike promptly and precisely against global targets using conventional kinetic effects. To this end, we are advancing a technology demonstration program to evolve, mature, and integrate critical technologies for a continental United States (CONUS)-based Conventional Strike Missile capability. This vision for a mid-term (fiscal years 2014/2015) capability will address the Nation's prompt conventional global strike requirement. To ensure there is no misinterpretation of intent, a multi-faceted package of mitigating measures will be added to the operational concept. Elements of this package could include: Coastal basing which is geographically separate from ICBM bases; associated on-site inspections/verification; unique and distinguishable trajectories and flight paths; avoiding overflight of nations of concern; and strategic dialogue that provides a window into U.S. thinking. Additionally, we are conducting an AoA to examine potential prompt global strike capabilities for the long-term (fiscal year 2020 and beyond).

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 Air Force 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 pro-

vides 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. 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, 20 AF 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 4-year deployment of the $114 million 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 DOD.

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 SBSS sensor. Also vital to the joint warfighter, our AEHF satellite program is back on track to deliver positive results in the near future. As previously stated, the first WGS 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 SBIRS 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 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 percent mission success with the new United Launch Alliance (ULA) initiative while implementing the "Buy 3" contracts. Recently, my vice commander, Lieutenant General Frank Klotz and I had the opportunity to visit the ULA plant in Decatur, AL, and were both impressed with the facility and the ULA team.

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-effec-

tive 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 U.S. 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 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 fiscal year 2010. 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 Directive0928. 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 AFSPC 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 ongoing 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). Reinvesting 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 fiscal year 2007. 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, two Naval Operations (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 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), and
- 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 SSA 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 AFSPC 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.

Senator BILL NELSON. Senator Sessions?

STATEMENT OF SENATOR JEFF SESSIONS

Senator SESSIONS. Thank you, Mr. Chairman. I sincerely apologize for being tied up after that vote we just finished.

First I'd like to thank this distinguished panel. You represent leadership in some of the most complex, technologically challenging and important parts of our defense establishment, and we appreciate that.

The Air Force has been faced with the difficult challenge of modernizing military space systems in virtually every mission area. Strategic missile warning, assured communications, navigation, and intelligence and surveillance. We've explored in this subcommittee previously that many of these programs have suffered substantial problems with regard to cost, schedule, and technical performance.

But, thanks to a new Air Force leadership, practices that you all have worked on, I believe we may be turning the corner on some of those worst problems. I think progress has been made and I'd like to inquire a little bit more about it, but my hope is that the new back-to-basics approach in conjunction with new emphasis on ORS, will expedite delivery of capabilities to the warfighter in a cost-effective manner.

Our budget, the $8.1 billion budget request for space modernization in fiscal year 2008, is up from the fiscal year 2007 appropriated amount of $6.7 billion, but it falls $400 million short of what the Air Force had planned to spend, so we need to look at those expenditures and whether or not we're meeting the needs that are out there.

Mr. Chairman, thank you for this opportunity to say a few words and I'll look forward to hearing from the panel.

[The prepared statement by Senator Sessions follows:]

PREPARED STATEMENT BY SENATOR JEFF SESSIONS

Mr. Chairman, I would like to welcome today's witnesses and thank them, and their organizations, for their hard work and contributions to our Nation's security. While the recent anti-satellite test conducted by China has raised the visibility of space programs, we both realize that the Department of Defense has been working hard to ensure that our space capabilities are second to none.

The Air Force has been faced with the difficult challenge of modernizing military space systems in virtually every mission area: strategic missile warning. assured communications, navigation, and intelligence and surveillance. For reasons that this subcommittee has explored previously, many of these modernization programs have suffered substantial problems with regard to cost, schedule, and technical performance.

Thanks to new Air Force Space leadership and practices, I believe we may be turning the corner on the worst of these problems. It is my hope that the new "back to basics" approach, in conjunction with the new emphasis on Operationally Responsive Space, will expedite delivery of capabilities to the warfighter in a cost-effective manner.

Mr. Chairman, there is something that troubles me. While the Department of Defense and the Air Force clearly acknowledge the critical importance of space programs as an enabler for virtually every defense mission area, it has nevertheless reduced the planned growth in space funding that was presented to Congress last year.

Although the $8.1 billion request for space modernization in fiscal year 2008 is up from the fiscal year 2007 appropriated amount of $6.7 billion, the request falls $400 million short of what the Air Force planned to spend in fiscal year 2008.

As we will explore during the course of this hearing, this funding shortfall has serious implications for several key modernization programs in the area of space communications and space control.

In light of recent Chinese space activities, and the growing importance of space for United States national security, I think we need to look carefully at whether the budget request for space modernization, which is 21 percent of total Air Force modernization, is adequate.

Mr. Chairman, I thank you and look forward to hearing from the witnesses.

Senator BILL NELSON. Okay.

General?

STATEMENT OF MAJ. GEN. WILLIAM L. SHELTON, USAF, COMMANDER, JOINT FUNCTIONAL COMPONENT COMMAND FOR SPACE, UNITED STATES STRATEGIC COMMAND

General SHELTON. Mr. Chairman and members of the subcommittee, it's a pleasure for me to be here with you today.

I wear two hats. I'm the 14th Air Force Commander, but I'm also Strategic Command's (STRATCOM) Joint Functional Component Commander for Space. It's in that latter role that I appear before you today. I look forward to your questions. So, I'll be looking at the operational perspective of STRATCOM.

[The prepared statement of General Shelton follows:]

PREPARED STATEMENT BY MAJ. GEN. WILLIAM L. SHELTON, USAF

Chairman Nelson, Senator Sessions, and members of the subcommittee: I am honored to be here today alongside distinguished members of the panel: Under Secretary of the Air Force, Hon. Ron Sega; General Kevin Chilton, Commander of Air Force Space Command; Vice Admiral James McArthur, Jr., Commander of Naval Network Warfare Command; and Cristina Chaplain, Director of Acquisition and Sourcing Management, Government Accountability Office. This is my first opportunity to appear before you as United States Strategic Command's (USSTRATCOM) Commander of the Joint Functional Component Command for Space (CDR JFCC SPACE), and it's a pleasure to be able to address you on our space posture.

I know this subcommittee is fully aware of the growing importance of space capabilities to our national security, as well as to our overall economic prosperity. Today, I will provide you an update on our efforts to efficiently and effectively employ our vital space capabilities, highlighting our top priorities, and identifying the challenges we face in fulfilling both national and combatant commander objectives.

EMPLOYMENT OF SPACE CAPABILITIES

In July 2006, General Cartwright, the Commander of USSTRATCOM, in coordination with the Chief of Staff of the Air Force, directed the creation of JFCC SPACE, and assigned the Commander, 14th Air Force, the dual role of CDR JFCC SPACE. While I serve in both roles, it's in the CDR JFCC SPACE position that I am designated as the single point of contact for military space operational matters. Additionally, JFCC SPACE is responsible for providing tailored, responsive, local, and global space effects to supported combatant commanders. My USSTRATCOM-delegated authorities include Global Space Coordinating Authority, which empowers me to be the primary interface with supported commanders for operational-level planning and execution of space forces in support of combatant commander objectives. CDR JFCC SPACE is also assigned Operational Control and Tactical Control authorities for designated, worldwide space operations and missile warning forces. Finally, JFCC SPACE supports the Commander, North American Aerospace Defense Command (NORAD) by providing the missile warning and space surveillance capabilities necessary to fulfill the U.S. commitment to the NORAD Agreement. By establishing the CDR JFCC SPACE, USSTRATCOM provides a single commander, with a global perspective, to enhance functional integration of space capabilities for the joint warfighter and the Nation.

Just in the last year, two significant world events have galvanized our thinking by highlighting both the importance and the potential fragility of our Nation's space capabilities. The first event occurred during our initial month of operation—the July 2006 North Korean launch of a Taepo Dong-2 (TD–2) missile. The second event was the January 2007 Chinese test of a hit-to-kill anti-satellite (ASAT) capability. Interesting enough, this test occurred 6 years to the day after the publication of the 2001 Space Commission Report, which had warned of growing threats to our space capabilities. In both events, JFCC SPACE coordinated pre-launch indications and warning campaigns, then provided space-based tracking of the boosters during flight, which helped shape the national response. We worked closely with our USSTRATCOM global mission partners and various agencies to ensure space capabilities were available to support potential contingencies and courses of action. For

the ASAT test, we tracked the resultant debris, and we continue to assess the additional risk posed by the debris to our satellites and the International Space Station. These events foreshadow a future that appears increasingly challenging. Our near-term priorities, which include increasing our Space Situational Awareness (SSA) capabilities and strengthening and formalizing departmental and interagency relationships, are certainly informed by our experience from these two events.

One of our most important lessons learned was that our current systems processing such events are not sufficiently dynamic. Outstanding people overcame these limitations by arranging manual data and voice workarounds, but clearly, this should not be how we conduct space command and control operations in the future.

Strengthening unity of command and unity of effort is critical in executing timely actions to preserve space effects for the Nation. Organizationally, we are taking steps to gain better access to limited resources. Among these include dual-hatting the Deputy Commander of JFCC SPACE (DCDR JFCC SPACE) with the National Reconnaissance Office's Deputy Director for Mission Support (NRO/DDMS). This designation will help strengthen the bonds between NRO space operations and Department of Defense (DOD) space operations. We are constantly searching for opportunities to synergize efforts and leverage existing resources in the employment of space capabilities. Unity of effort in tactics, techniques, and procedures, underpinned by a net-centric system designed to provide both enhanced SSA and operational-level command and control, will strengthen JFCC SPACE operations.

To ensure USSTRATCOM, through JFCC SPACE, can deliver persistent space effects in support of both national and combatant commander objectives, we rely on the Services, under the able coordination and direction of the DOD Executive Agent for Space, Dr. Sega, to acquire the space systems we need to maintain our tremendous advantage in space. I thank Dr. Sega for his leadership in our Nation's space capability development. Through his efforts, and those of our talented sailors, soldiers, airmen, and marines, we are able to enhance the quality of current space effects and ensure continuity of services in our position, navigation, and timing (PNT), missile warning, satellite communications, and environmental monitoring capabilities.

CHALLENGES

Our Nation's growing dependence on space-based capabilities creates a corresponding potential vulnerability. Therefore, preserving our space-based capabilities against intentional and unintentional events will be a growing challenge as more entities gain access to the space domain.

We currently track over 16,000 artificial objects in space, to include everything from active satellites to launch-related debris. Although this is certainly a large number of objects, there are many more that are too small for our space surveillance sensors to track. As the number of objects increases, so does the potential for a catastrophic collision in space. The addition of over 1,600 pieces of trackable debris from the Chinese ASAT test further complicates the problem.

Along with the growing debris population, there are many other current and developing threats to our space capabilities. To fully understand the potential threat to national assets, DOD payloads, commercial space satellites, and manned space systems, we depend on both ground- and space-based space surveillance sensors.

Every commander strives for the best situational awareness possible before he/she engages in operational activity. For space operations, this imperative is especially true, given our investment in space, our dependence on space capability, and the difficulty of replacing assets following an unexpected loss. As the threats to our space assets grow, our ability to provide robust SSA must grow commensurately. We will become increasingly dependent; on the availability of a persistent, predictive, dynamic SSA capability. The success of our space operations will hinge on a decisionmaker's ability to quickly answer the "who, what, when, where, how, and why" questions, as he/she determines a course of action to support our national security objectives. We must have thorough, decision-quality, knowledge of all constituent parts of SSA: the space environment conditions, the space debris situation, the status of blue forces, and the intelligence picture, which includes enhanced information on potential adversary space capabilities and intent.

An increasingly threatened, dynamic environment will drive us to highly automated, net-centric capabilities. Machine-to-machine interfaces will enhance decisionmakers' ability to quickly and accurately assess emerging space capabilities and threats. The net-centric data sharing that will occur will allow much easier integration of disparate data, enhancing the overall situational awareness of the warfighter. I thank General Chilton for his strong leadership and commitment to making SSA a top priority within Air Force Space Command. He is driving hard

toward vastly improved SSA to provide that crucial underpinning for JFCC SPACE operations.

CONCLUSION

Space operations are changing rapidly. Dynamically taskable satellites, increasing threats to the space environment, and the dependence on space, are all key factors that drive our decisions on the future of operational command and control in JFCC SPACE. It's an exciting time to be in the space business, and I am privileged to command the men and women who employ these great space capabilities for our Nation. I thank you for your time and attention, and for your assistance in preserving the vital space capabilities for our national security.

Senator BILL NELSON. Admiral?

STATEMENT OF VADM JAMES D. MCARTHUR, JR., USN, COMMANDER, NAVAL NETWORK WARFARE COMMAND

Admiral MCARTHUR. Mr. Chairman, distinguished members, I'm Vice Admiral Jim McArthur from Naval Network Warfare Command.

Our responsibilities are to provide C4 systems, information operations, and space affects to Navy component commanders arrayed globally. We're also a functional component of U.S. STRATCOM. The Navy's had a long history in space, both as a consumer and an operator. We feel like maritime security, maritime domain awareness, and force net will continue to rely on that.

In fact, the interdependency will grow enormously. I look forward to discussing those interdependencies with you. We need assured and responsive space, space effects, and fortunately those are being provided today with the component of U.S. STRATCOM.

It's an honor to appear before you, and I look forward to the questions, sir.

[The prepared statement of Admiral McArthur follows:]

PREPARED STATEMENT BY VADM JAMES D. MCARTHUR, JR., USN

Mr. Chairman and distinguished members of the subcommittee, as the Commander of Naval Network Warfare Command, I am honored to appear before you today to address Navy space activities. Naval Network Warfare Command is responsible for providing operational network, information operations, and space effects, as a supporting commander to Navy component and joint commanders.

The Chief of Naval Operations (CNO) pointed out our two unique Navy attributes—global reach and persistent presence—during his 23 March 2007 fiscal year 2008 posture hearing. This means we as a Navy must be prepared to conduct major combat operations, address asymmetric threats, as well as provide maritime security in a variety of ways in an ever changing world. The value that the Navy brings in terms of regional security, global stability, and anti-access capabilities is undeniable. All of this requires space capabilities that are rapid, dynamic and assured. Space can be viewed as a classic inter-dependency; Naval component commanders depend on U.S. Strategic Command to provide Department of Defense (DOD) and national space effects, essential for successful naval operations. I will share with you what we are doing as part of the joint space team.

SPACE SUPPORT TO THE NAVY WARFIGHTER

Warfare today and in the future will be about speed and having superiority in the information domain—acting quickly in the global commons of the seas, space, and cyberspace before an adversary saturates or penetrates our defenses. It will also be about persistence—having the duration and vantage point to find threats and counter them with precision. Space capabilities are a critical enabler for maritime operations. They provide the foundation through which data is rapidly collected, fused, correlated and disseminated to build Maritime Domain Awareness and support the National Strategy for Maritime Security. In general, naval warfighters need global coverage, wide-area active and passive surveillance capabilities, robust jam-

resistant communications, and position, navigation and timing information for core Navy warfighting competencies, deterrence missions, and stability operations.

NAVAL SPACE CAMPAIGN PLAN

The Naval Space Campaign Plan is my blueprint for operationalizing space support to the maritime warfighter. As we implement and execute the plan, we are breaking new ground in the Fleet's operational employment of space effects. NETWARCOM's NetOps, IO, and Space Center (NIOSC) functions as a true reachback staff element for deployed Strike Groups and forward Maritime Headquarters. The space planners in the NIOSC broker maritime operational and exercise space needs with the Joint Space Operations Center at Vandenberg Air Force Base and assist the theater Space Coordinating Authorities as they develop the space support requests for their AORs. This insures that the desired DOD and national technical space effects are delivered in support of fleet activities. Concurrently, NETWARCOM is formalizing the fleet's training and exercise play. By advancing the fleet's space systems knowledge through regular staff training sessions and standardizing the way the fleet trains during FRTP to fight in an environment with mature threats to our space systems, we are ensuring our strike groups and staffs are equipped to fully leverage and integrate joint and national space capabilities and operate against a regional space peer.

THE NAVY'S INVESTMENT

The Navy's space investment portfolio reflects our partnership with the Department of Defense's Executive Agent for Space and the rest of the National Security Space community—as well as our maritime responsibilities. We recognize our reliance on the Air Force and National Reconnaissance Office (NRO) to acquire most of the major space platforms. The Navy's Space Cadre works closely with them to collaborate on meeting maritime requirements. We also take the lead in tackling maritime challenges through our participation in the science and technology (S&T)/research and development (R&D) process. Our Tactical Exploitation of National Capabilities office works closely with the NRO to develop new technologies and techniques to collect and exploit against emerging naval threats, including developing operationally responsive payloads.

In addition to our major space segment responsibility for narrowband satellite communications (SATCOM), which I will talk about more specifically in a moment, my organization is leading change in two key areas that will make our Navy more capable of fully leveraging space capabilities. First, we are using a combination of military and commercial satellite capabilities to increase available bandwidth. In conjunction with this effort, we are investing in the dynamic management of existing bandwidth (i.e., Automated Digital Network System, new modems, etc). Together, these strategies will be used to deliver our warfighting requirements, enabling the Naval Operating Concept vision of "distributed network operations." These increased capabilities will further enhance education and training opportunities available at sea and support other quality of service aspects expected by the Millennium Generation. Second, we are breaking the link between software and hardware by moving to an open architecture approach. Through strong governance and fiscal discipline, we are developing a Service Oriented Architecture to enable lower cost upgrades, reduce equipment costs, and rapidly insert new technology. Our goal is to ensure the capacity and flexibility to rapidly integrate space, as well as capabilities from other platforms, into our architecture.

MOBILE USER OBJECTIVE SYSTEM

The Navy's major space segment responsibility to the joint community is the narrowband satellite communications constellation. Today it consists of Ultra High Frequency (UHF) Follow-on (UFO) and Fleet Satellites (FLTSATs) which will begin to be replaced by the Mobile User Objective System (MUOS) in 2010. MUOS will provide communications-on-the-move, through double canopy foliage and in urban environments to small antennas used by disadvantaged users (handhelds, aircraft, missiles, unmanned aerial vehicles (UAVs), remote sensors) in stressed environments (foliage, urban environment, high sea state). MUOS is the common denominator for command and control providing the capability to communicate from tactical to theater levels, to allies and coalition partners, and between defense and non-defense agencies. MUOS will allow a more comprehensive and coordinated approach to regional engagement, providing the capability to synchronize efforts with other Services, agencies, and allied nations.

MUOS is critical to satisfying the demand for tactical satellite communications. During Operations Enduring Freedom and Iraqi Freedom, UFO, FLTSAT, and

LEASAT 5 were only able to support 80 percent of the narrowband tactical UHF satellite communication requirements. Additionally, in the 2010 timeframe, LEASAT 5 will reach its end of service life, and the UFO constellation, based on new analysis after the premature UFO 9 failure, is expected to reach an unacceptable level of availability in May 2008. We have a mitigation plan to minimize the operational impact of a potential gap in capability (seven operational satellites vice the required eight) before MUOS is operational. It includes the use of commercial bandwidth and the dynamic management of existing bandwidth as mentioned previously. Today, UFO supports approximately 500 simultaneous accesses worldwide. Based on evolving future war fighting concepts in support of the Defense Planning Guidance, UHF SATCOM access requirements are expected to grow by at least a factor of four and MUOS, as designed, will be able to support that requirement.

Since last year the MUOS program successfully completed the Key Decision Point (C) milestone and the Critical Design Review phase. The program is currently on schedule and within budget to meet an On-orbit Capability in 2010 and is fully funded in the President's 2008 Budget to meet all threshold requirements. The MUOS program is currently preparing for the October 2007 Build Decision (for satellites 1 and 2). MUOS will bring a 4-fold increase in the number of accesses (1997 vice 500) and a 20-fold increase in throughput (39.2 Mbps, total system capacity vice 2 Mbps) worldwide while providing improved communications on the move to disadvantaged platforms (hand held terminals, aircraft, missiles, UAVs, remote sensors) at higher data rates (up to 64 kbps per access). This capability can only be realized with the fielding of MUOS capable Joint Tactical Radio System terminals or by upgrading existing UHF legacy software programmable terminals.

SPACE ENVIRONMENT

Navy depends on space capabilities now and expects the demand for space capabilities in the future, especially for SATCOM, to increase. We, like the rest of the Nation's leadership, were concerned by China's recent anti-satellite test, not only for its primary purpose of demonstrating a capability against spacecraft, but for the collateral effects of the debris created. That said, we recognize that all space capabilities are vulnerable to both low and high technology threats, including communication and data link jamming, attempts to exploit or disrupt computer systems, attacks against the sensors, and physical attack against the ground infrastructure. Although space threats can not be completely eliminated, Navy is embarking on a multi-pronged approach to minimize their potential impact on naval operations. We started with an internal study on space vulnerabilities in 2005 and have identified opportunities for action. First, Navy will have multiple communications paths available, including extremely high frequency (EHF), UHF, and super high frequency, as well as commercial systems. While we eagerly await the leap in communications capability that the Transformational Satellite (TSAT) will bring, the requested funding for an additional Advanced Extremely High Frequency satellite will improve protected communication capability in the near-term. Also, for our battlespace and maritime domain awareness needs, we will leverage a variety of sensors, including airborne and space based, and ensure a balance between sea and shore based intelligence analysis and processing capabilities. Finally, we are examining nonmaterial solutions, such as planning and training for degradation of space capabilities. As I've already mentioned, the NIOSC is currently providing focused space support to the Eisenhower, Stennis, and Bataan Strike Groups as part of the Naval Space Campaign Plan, with the goal of providing tailored space capabilities to improve the mission effectiveness of the fleet.

The Navy is working with U.S. Strategic Command to ensure comprehensive space intelligence is provided and appropriate means of protection are addressed systematically as space systems and their concept of operations are being developed. We communicated to Strategic Command the need for a balanced Space Control portfolio to ensure appropriate emphasis on protection and space situational awareness. As both the Secretary of the Navy and CNO have noted, we cannot allow ourselves to be fixated on one threat alone. Therefore, our collective efforts must take a broad-based perspective on the threat to space capabilities.

OPERATIONALLY RESPONSIVE SPACE

Navy supports Operationally Responsive Space (ORS) because maritime forces need the flexibility that ORS offers to augment and reconstitute critical warfighting capabilities in order to counter increasingly agile adversaries. Navy actively participated in the congressionally directed 120-day ORS study and will be an integral part of the ORS organization once a joint office is established. Building on over 50 years of small satellite experience, Navy is working closely with the Services, com-

batant commands (COCOMs), and the Intelligence Community to develop key elements of ORS through the TacSat series of experiments. We realize that ORS is more than just smaller, rapidly developed satellites and requires an end-to-end examination to develop the agility and capabilities needed to rapidly adapt to the ever evolving threat environment facing our Joint Force Commanders (JFC).

As part of the joint TACSAT and ORS effort, the Office of Naval Research (ONR) is investing $15 million of S&T funds each year in moderate-to-high-risk projects that result in significant prototypes through the Space Innovative Naval Prototype program. Investments are focused on naval capability gaps that space can fill such as ship tracking, data exfiltration from buoys, communications-on-the-move, submarine detection, cueing, and littoral characterization. TACSAT–2 was launched on 16 December 2006 and is undergoing testing. Commander Strike Group-8 is interested in leveraging one of its secondary payloads, built by the Naval Research Laboratory (NRL), for ship tracking and input into maritime domain awareness. We are looking forward to launching TACSAT–1 later this year after SpaceX gives the go-ahead for launch on its Falcon-1 rocket. NRL also built a secondary payload for TACSAT–3 that provides a basic IP-based data exfiltration capability. NRL is leading TACSAT–4 for the joint community with ONR funding the UHF Communications payload to support comms-on-the-move and data exfiltration. TACSAT–4 uses a prototype spacecraft bus resulting from a broad government-industry team effort to develop and mature bus standards for increased modularity. The spacecraft should be completed by the first half of next year and will be launched into a highly elliptical orbit to provide long dwells over theater. The TACSAT series of experiments reflect the partnerships that need to be developed between the Services, COCOMs, and Intelligence Community to innovate solutions and leverage the best talent available across the national security space community to solve warfighting challenges. NRL is managing the ORS Payload Technology initiative for the Office of the Secretary of Defense. This initiative jointly evaluated 75 industry proposals and awarded 14 which are being developed by industry now and over the course of the next year.

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

SUMMARY

Our mission of keeping the air and sea lanes open and ensuring the security of our citizens at home and abroad requires a global reach and persistent presence. We must be constantly ready, whether it is to deliver on a mission of mercy or more lethal measures to respond to a specific threat. Our ability to respond, as well as work with our coalition and other maritime partners, will depend on space capabilities for the necessary flexibility and speed to support our worldwide responsibilities. To deliver the required space capabilities to the warfighter and represent the Navy's interest in space, we will continue to invest in our most valuable resource, our people, the Navy Space Cadre.

The Navy remains committed to shaping space system capabilities and fully integrating those capabilities into maritime operations. We look forward to participating in ORS, as well as delivering MUOS for the joint warfighter.

Thank you for the opportunity to share our efforts with you today.

Senator BILL NELSON. Thank you, Admiral.

Ms. Chaplain?

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

Ms. CHAPLAIN. Thank you for inviting me here today.

The Government Accountability Office's (GAO) reviews for the past several years have painted a pretty bleak picture of space acquisitions. We've seen cost increases in billions of dollars, schedule delays in years, and performance risks. Today, the picture is a bit different, and I would like to comment on that.

On the plus side, we have some of the legacy programs, namely the Advanced Extremely High Frequency (AEHF) Satellite and Wideband Global Satellite (WGS) overcoming the bulk of their technical problems and are on track to meet revised targets. Also, more important, the Air Force is adopting what we see as best practices for space radar and the Transformational Satellite (TSAT). By that, I mean they're incorporating mature technologies before the program officially begins. They're deferring more ambitious technology efforts to the S&T environment and they're spending time defining requirements before the program starts. This is not a trivial effort.

I would like to comment that most every space program we've reviewed for the past decade has started with fairly immature technologies and has had problems setting requirements and sticking to them.

On the minus side, there's still several legacy programs at high risk for problems. They include SBIRS High, National Polar-Orbiting Operational Environmental Satellite System (NPOESS), and GPS IIF. Just looking at SBIRS High, for example, we already found that shortly after restructuring, the program is starting to diverge from some cost and schedule targets and management reserve is being depleted at a much faster rate than anticipated.

We also looked at this new program, the AIRSS, and we had a lot of concerns about what the true purpose of the system is, whether it's to serve as an insurance policy for the SBIRS High or be the follow-on program. Our concerns are rooted into a lot of concerns that were transmitted to us from people within DOD. There were also a lot of concerns within DOD about schedule risks for that program. So, I think those two issues need to be addressed before that moves forward.

I just want to end by making the point that in the larger context, the environment is still not very conducive for sustaining the good practices we see being adopted in space radar and TSAT. The top three obstacles that we see are one, workforce capacity, which has already been mentioned here. GAO studies and DOD studies have identified deficiencies in program management skills, business skills—particularly in cost estimating—and technical skills—particularly in systems engineering. Programs like TSAT express concerns that they may not have the technical people they need in the next year or so.

Policy is another longstanding concern of ours. The space acquisition policy, as it currently stands, does not mandate that best practice levels of knowledge be achieved before starting the program. So, we would like to see this back-to-basics policy be integrated into the formal acquisition policy so that the good practices being started now, stay beyond the tenures of current leadership.

The last obstacle, of course, is always funding. There's a lot of funding pressures throughout the whole weapons system portfolio and a lot of GAO work that has been done tells us that programs really need to be prioritized for funding and best practices for investment, like portfolio management, need to be adopted across the Department, so that programs like TSAT and space radar are not incentivized to produce overly optimistic reports.

Thank you.

[The prepared statement of Ms. Chaplain follows:]

PREPARED STATEMENT BY CRISTINA T. CHAPLAIN

Mr. Chairman and members of the subcommittee: I am pleased to be here today to discuss the Department of Defense's (DOD) space acquisitions. Each year, DOD spends billions to acquire space-based capabilities to support current military and other government operations as well as to enable DOD to transform the way it collects and disseminates information, gathers data on adversaries, and attacks targets. In fiscal year 2008 alone, DOD expects to spend over $22 billion to develop and procure satellites and other space systems, including nearly $10 billion on selected major space systems.[1] Despite its growing investment in space, however, DOD's space system acquisitions have experienced problems over the past several decades that have driven up costs by hundreds of millions, even billions of dollars; stretched schedules by years; and increased performance risks. In some cases, capabilities have not been delivered to the warfighter after decades of development.

In view of these problems, the Air Force, DOD's primary space system acquirer, has been attempting to instill best, practices in two newer space programs—Space Radar and the Transformational Satellite Communications System (TSAT). These steps can help better position the two programs for success, but they will not work without adhering to commitments to delay milestone decisions if there are still gaps between requirements and resources, and to use more robust tools to analyze risks, costs, and schedule. Moreover, other space programs—new and old—are still facing setbacks, reflecting problems in technology development or design, problems in managing contractors, and more broadly, funding shifts needed to sustain the larger space portfolio. Such setbacks—common among all weapons acquisitions—continue to hamper the Air Force's ability to provide resources and support needed to deliver capabilities within cost, schedule, and performance targets. My testimony today will highlight our findings on space acquisitions as well as actions needed to address persistent, acquisition problems and to build on best practice approaches being adopted in Space Radar and TSAT.

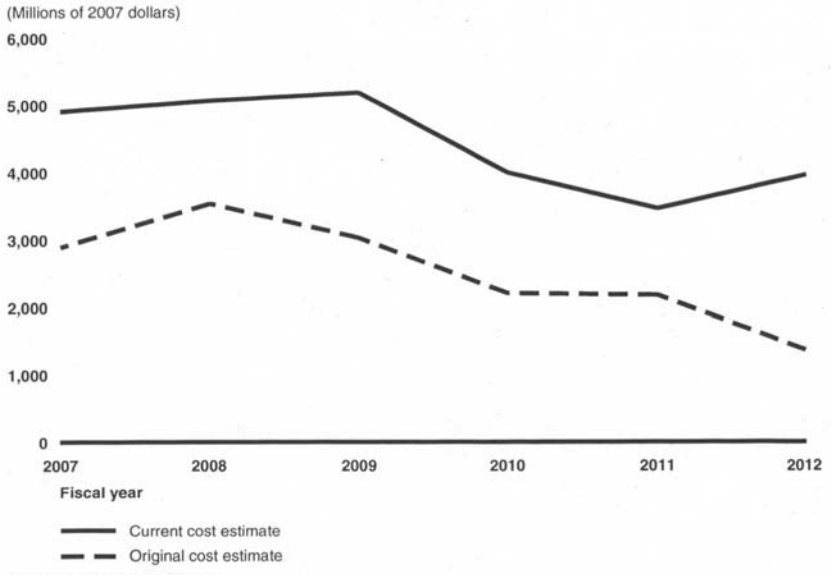
SPACE ACQUISITIONS CONTINUE TO FACE COST AND SCHEDULE INCREASES

The majority of major acquisition programs in DOD's space portfolio have experienced problems during the past two decades that have driven up cost and schedules and increased technical risks. Several programs have been restructured by DOD in the face of delays and cost growth. At times, cost growth has come close to or exceeded 100 percent, causing DOD to nearly double its investment in the face of technical and other problems without realizing a better return on investment. Along with the increases, many programs are experiencing significant schedule delays—as much as 6 years—postponing delivery of promised capabilities to the warfighter. Outcomes have been so disappointing in some cases that DOD has had to go back to the drawing board to consider new ways to achieve the same. or less, capability. Some programs have been able to work through the bulk of technical problems they were facing and are on track to meet revised targets, albeit at higher costs and with delayed deliveries. Others, however, continue to face setbacks.

The following chart compares original cost estimates and current cost estimates for the broader portfolio of major space acquisitions for fiscal years 2007 through 2012. The wider the gap between original and current estimates, the fewer dollars DOD has available to invest in new programs.

[1] Estimates of fiscal year 2008 spending on procurement and research, development, test, and evaluation are based on DOD's fiscal year 2007 Future Years Defense Program (FYDP) plan. The fiscal year 2008 FYDP plan was not available to us at the time we developed this testimony.

Figure 1: Comparison between Original Cost Estimates and Current Cost Estimates for Selected Major Space Acquisition Programs[a] for Fiscal Years 2007 through 2012

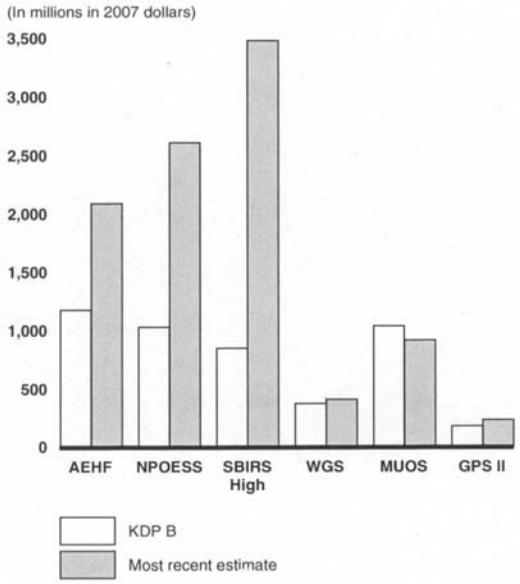


Source: GAO analysis of DOD data.

[a]Includes: Advanced Extremely High Frequency (AEHF) satellites, Evolved Expendable Launch Vehicle (EELV), Global Broadcast Service (GBS), Global Positioning System II (GPS) , Mobile User Objective System (MUOS), National Polar-orbiting Operational Environmental Satellite System (NPOESS), Space Based Infrared System (SBIRS)High, and Wideband Global SATCOM (WGS).

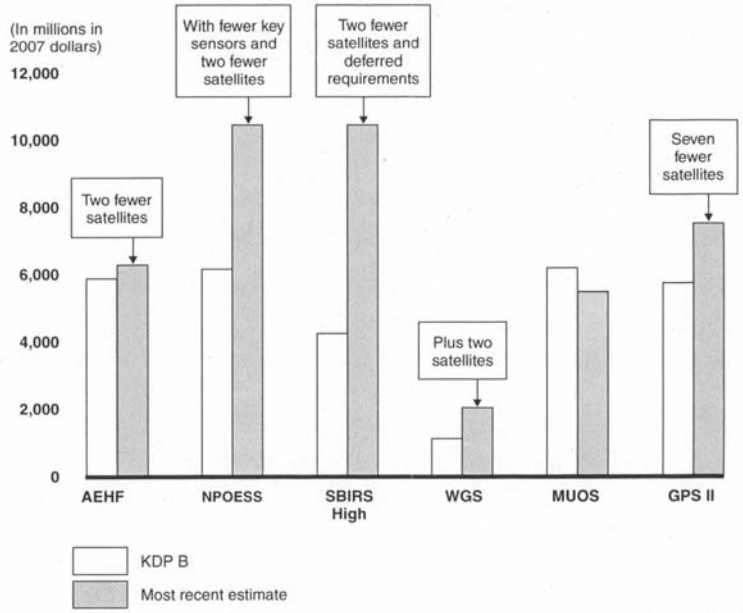
The next two figures reflect differences in unit costs and total costs for satellites from the time the programs officially began to their most recent cost estimate. As the second figure notes, in several cases, DOD has had to cut back on quantity and capability in the face of escalating costs. For example, two satellites and four instruments were deleted from National Polar-orbiting Operational Environmental Satellite System (NPOESS) and four sensors are expected to have fewer capabilities. This will reduce some planned capabilities for NPOESS as well as planned coverage. Likewise, the Space Based Infrared System (SBIRS) High missile detection program deferred capabilities, such as mobile data processors for the Air Force and the Army and a fully compliant backup mission control facility, and it pushed off a decision to procure the third and fourth satellites, which will not meet SBIRS High requirements for coverage. Despite such measures, unit, costs for both programs are still considerably higher than originally promised. In addition to SBIRS High and NPOESS, the programs featured in the figures include the Advanced Extremely High Frequency (AEHF) satellites, the Wideband Global SATCOM (WGS) and the Mobile User Objective System (MUOS), which are all communications satellites, and the Global Positioning System (GPS) II.

Figure 2: Differences in Unit Life Cycle Cost from Key Decision Point (KDP) B (Program Start) and Most Recent Estimate



Source: GAO analysis of DOD data.

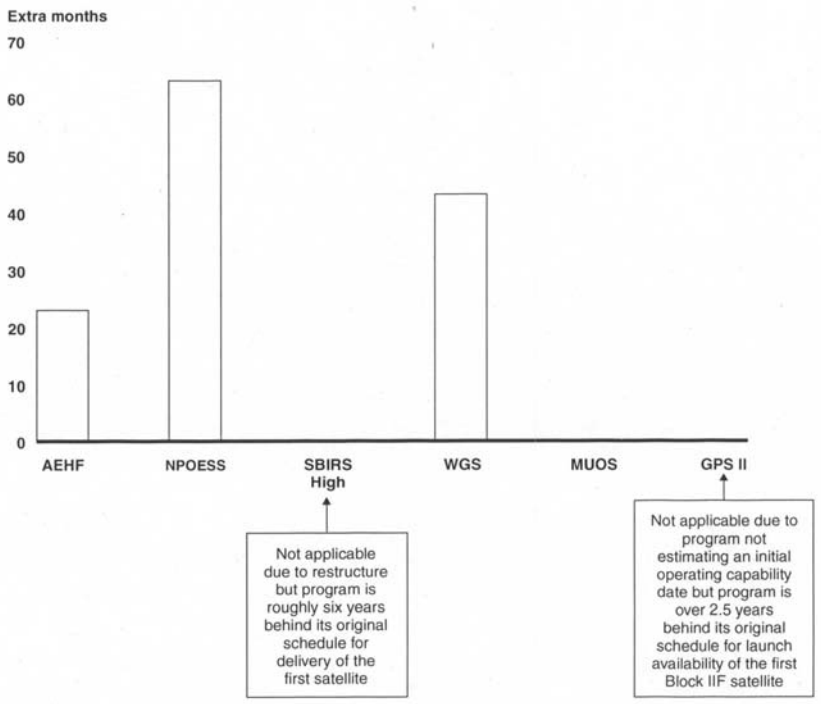
Figure 3: Differences in Total Program Costs from Key Decision Point (KDP) B and Most Recent Estimate



Source: GAO analysis of DOD data.

The next chart highlights the additional estimated months needed to complete programs. These additional months represent time not anticipated at the programs' start dates. Generally, the further schedules slip, fee more DOD is at risk of not sustaining current capabilities. For this reason, DOD began an alternative infrared system effort, known as the Alternative Infrared Satellite System (AIRSS), to run in parallel with the SBIRS High program.

Figure 4: Additional Months Needed since Program Start



Source: GAO analysis of DOD data.

Some programs, such as AEHF and WGS, have worked through the bulk of technical and other problems that were causing large schedule increases and cost delays. For example, the AEHF program, which has been in the final stages of development for almost 3 years, resolved issues related to its cryptographic equipment and is on track to meet a revised date for first launch. The WGS program completed rework on improperly installed Fasteners, and contractors have redesigned computers to rectify data transmission errors. The program expects a first launch in June 2007. As noted in our figures, the MUOS program, which began more recently than AEHF and WGS, is generally meeting its targets, though it has yet to enter into the more difficult stages of satellite production, integration and test.

By contrast, the SBIRS High program still faces considerable risks. Recent GAO work for this subcommittee, for example, shows that the program is diverging from cost and schedule targets just months after rebaselining due to problems related to assembly, integration, and testing and that the contractor's estimates for addressing these issues are overly optimistic. Defense Contract Management Agency reports also show that software development efforts are behind schedule—by as much as 32 percent. In addition, the contractor has already spent about 28 percent, or $66 million, of its management reserve from April 2006 to November 2006. This reserve is designed to last until 2012, but at the current rate, is likely to be depleted by May 2008. If this trend continues, $500 million in additional reserve will be needed. As noted earlier, DOD initiated an alternative effort—AIRSS—to ensure it would have continued capabilities. However, we have questions as to whether AIRSS is being pursued as a "plan B" program, as originally envisioned. Rather than seek to maintain continuity of operations, the program is focused on advancing capabilities because program managers believe there are no viable alternatives. We also found that there was disagreement among DOD stakeholders as to whether there were alternatives or not, and there was concern that the AIRSS schedule may he too compressed. Our analysis also found that there was a high degree of concurrency in the

program's schedule, which may be limiting DOD's ability to gain knowledge from planned demonstrations and increased the potential for costly rework further in the program.

The GPS Block IIF program is also al a high risk of cost increases and schedule delays. Since our last, annual assessment of the GPS Block IIF program, the program has revised its acquisition program baseline to account for cost increases and schedule delays, and requested an additional $151 million to cover these costs. The number of IIF satellites to be procured was reduced from 19 to 12. Further, the launch date of the first IIF satellite continues to slip. The original baseline showed an initial launch availability date of December 2006, but DOD's current baseline shows July 2009—a slip of about 2.5 years. The program also learned that the contractor's earned value management reporting system was not accurately reporting cost and schedule performance data. A DOD report also recently found that development of user equipment has not been synchronized with the development of satellites and control system, increasing the risk of substantial delays in realistic operational testing and fielding of capabilities. GPS is taking measures to address these problems. For example, this year, it did not award its contractor $21.4 million in award fees. In December 2005, GAO recommended that DOD improve its use of award fees for all weapon system contracts by specifically lying them to acquisition outcomes. A review of a sample of programs, including SBIRS High, found that this was generally not done.

The NPOESS program is also still at risk of more cost increases and schedule delays. In June 2008, DOD certified the NPOESS program to Congress, and with agreement from its program partners, DOD restructured the program. Now the NPOESS program acquisition costs are estimated to be about $11.5 billion—an increase of about $3 billion over the prior cost estimate. Before the contract was awarded, in 2002, the life cycle cost, for the program was estimated to be $6.6 billion over the 24-year period from the inception of the program in 1995 through 2018. The delivery of the first two NPOESS satellites has been delayed by roughly 4 and 5 years, and as noted earlier, the number of satellites to be produced has been reduced from six to four. In addition, the number of instruments was reduced from 13 (10 sensors and 3 subsystems) to 9 instruments (7 sensors and 2 subsystems), and 4 of the remaining sensors will have fewer capabilities. The NPOESS program will incorporate any number of the deleted instruments if additional funding is provided from outside the NPOESS program. The program restructure will result in reduced satellite data collection coverage, requiring dependence on a European weather satellite for coverage during mid-morning hours. Although the program has reduced the number of satellites it will produce, the cost per satellite is more than 150 percent above the original approved program baseline. The NPOESS program is now updating the cost, schedule, performance baselines, and acquisition strategy, and coordinating the changes with the three agencies. The program expects these documents to be approved later this year. While work is continuing on key sensors, the program still faces potential problems in their development.

The Space Based Space Surveillance (SBSS) system—not featured on the charts above because it is not yet a formal acquisition program—is also encountering problems. The SBSS system is to replace an aging sensor on an orbiting research and development satellite and improve the timeliness of data on objects in geosynchronous orbit. As currently planned, the initial block will consist of a single satellite and associated command, control, communications, and computer equipment. Subsequent SBSS efforts will focus on building a larger constellation of satellites to provide worldwide space surveillance of smaller objects in shorter timelines. In late 2005, an independent review team found that the program's baseline was not executable; that the assembly, integration, and test plan was risky; and that the requirements were overstated. The SBSS program was restructured in early 2006 due to cost growth and schedule delays. The restructuring increased funding and schedule margin; streamlined the assembly, integration, and test, plan; and relaxed requirements. The launch of the initial satellite was delayed to April 2009—a delay of about 18 months. Cost growth due to the restructure is about $130 million over initial estimates.

Last, additional cost increases are expected for the Evolved Expendable Launch Vehicle (EELV) program, but for reasons that are different than the ones being experienced on the satellite programs, hi recent years, program cost, has risen 79 percent, with a cost per unit increase of 136 percent,. A chief reason for cost increases is a decline in the commercial launch market upon which the program's business ease was based. Cost increases are also a result of additional program scope, including mission assurance, assured access to space, and earned value management systems reporting. In addition, satellite vehicle weight growth and satellite launch delays have contributed to cost increases. In December 2006, Boeing and Lockheed

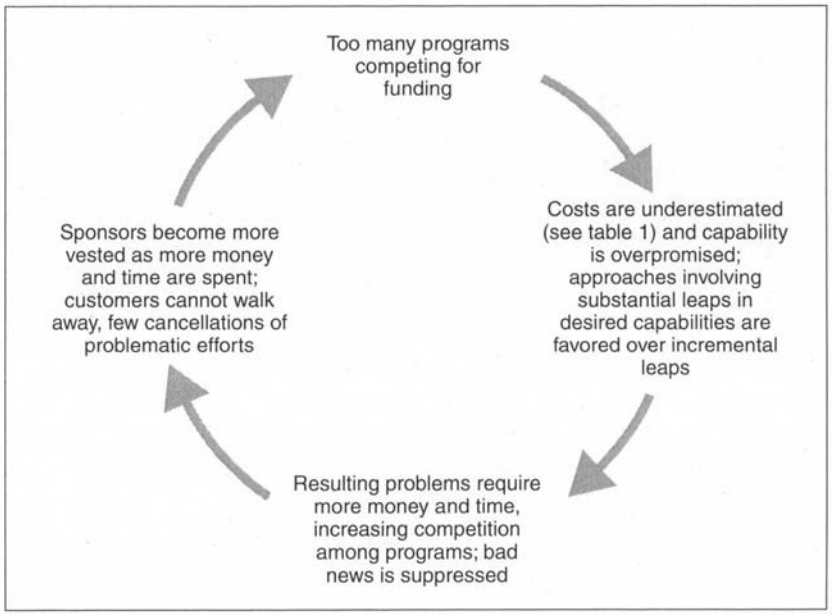
Martin Initiated a joint venture (United Launch Alliance (ULA)) that will combine the production, engineering, test, and launch operations associated with U.S. Government launches of Boeing Delta and Lockheed Martin Atlas rockets. Though the EELV program office expects long-term savings to be achieved through this arrangement, the cost per launch under a recently negotiated Buy III acquisition strategy will be higher than under Buy I. According to the Air Force, this is because the contractors will incur additional costs to allow the government, to perform the necessary oversight not required under Buy I. (Exact estimates of the new cost per launch have not been finalized by the program office yet.) Under the new strategy, EELV will be transitioning from a fixed-price arrangement, where launches were essentially procured as a service, to a combination of a cost-plus and fixed-price contracts. The arrangement will allow the government to exercise more oversight, and to incentivize contractors through the use of award fees. But to realize these benefits, the Air Force will need to ensure it has resources (skills, expertise, and tools) to begin accumulating and analyzing detailed cost, schedule, performance, design, and technical data. In addition, it will be important to assess progress in achieving longer-term savings envisioned under ULA as well as to ensure that the combined assets of the contractors are adequately protected.

UNDERLYING REASONS FOR COST AND SCHEDULE GROWTH

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

Figure 5 illustrates the negative cycle of incentives that come when programs compete for funding. Table 1 highlights specific areas where we found the original cost estimates of programs to be optimistic in their assumptions.

Figure 5: Pressures Associated when Too Many Programs Are Competing for Funding



Source: GAO.

Table 1: Areas where Space Programs Were Too Optimistic in Their Cost Estimate Assumptions

	Space programs affected					
Optimistic assumptions	**AEHF**	**EELV**	**GPS IIF**	**NPOESS**	**SBIRS**	**WGS**
Industrial base would remain constant and available		×	×	×	×	×
Technology would be mature enough when needed	×		×	×	×	×
Acquisition reform efforts (implemented via Total System Performance Responsibility policy) would reduce cost and schedule		×	×	×	×	
Savings would occur from experience on heritage systems	×			×	×	×
No weight growth would occur	×			×	×	×
Funding stream would be stable	×		×	×	×	
An aggressive schedule could be met	×			×	×	×
No growth in requirements	×		×		×	

Source: GAO analysis.

Note: This table was developed as part of a larger review on DOD's space cost-estimating function. Information was derived from discussions with program and contractor officials and GAO analysis. In some cases, programs may have ultimately experienced problems related to one of the categories, but we did not have evidence to show that the original assumptions were optimistic.[2]

Second, as we have previously testified and reported, DOD has tended to start, its programs too early, that is before it has the assurance that the capabilities it is pursuing can be achieved within available resources and time constraints. This

[2] "GAO, Space Acquisitions: DOD Needs to Take More Action to Address Unrealistic Initial Cost Estimates of Space Systems, GAO–07–96, (Washington, DC: Nov. 17, 2006).

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

A companion problem for space systems is that programs have historically attempted to satisfy all requirements in a single step, regardless of the design challenge or the maturity of the technologies necessary to achieve the full capability. Increasingly, DOD has preferred to make fewer but heavier, larger, and more complex satellites that perform a multitude of missions rather than larger constellations of smaller, less complex satellites that gradually increase in sophistication. This has stretched technology challenges beyond current capabilities in some cases and vastly increased the complexities related to software—a problem that affected SBIRS High and AEHF, for example.

In addition, several of the space programs discussed above began in the late 1990s, when DOD structured contracts in a way that reduced government oversight and shifted key decision-making responsibility onto contractors. This approach—known as Total System Performance Responsibility (TSFR)—was intended to facilitate acquisition reform and enable DOD lo streamline a cumbersome acquisition process and leverage innovation and management, expertise from the private sector. However, DOD later found that this approach magnified problems related to requirements creep and poor contractor performance. In addition, under TSPR, the government decided not to obtain certain cost data, a decision that, resulted in the government having even less oversight of the programs and limited information from which to manage the programs. Further, the reduction In government oversight and involvement led to major reductions in various government, capabilities, including cost-estimating and systems-engineering staff. The loss of cost-estimating and systems-engineering staff in turn led to a lack of technical data needed to develop sound cost estimates.

DOD IS IMPLEMENTING BEST PRACTICES ON TWO NEW EFFORTS

Over the past decade, GAO has examined successful organizations in the commercial sector to identify best practices that can be applied to space and weapon system acquisitions. This work has identified a number of practices, which we have recommended that DOD adopt. Generally, we have recommended that DOD separate technology discovery from acquisition, follow an incremental path toward meeting user needs, match resources and requirements at program start, and use quantifiable data and demonstrable knowledge to make decisions to move to next phases. DOD is making efforts to instill these practices on two programs reviewed this year: the TSAT and the Space Radar program. Specifically:

- Successful organizations we have studied ensure that technologies are mature; that is, proven to work as intended before program start. Both TSAT and Space Radar are attempting to do this. According to their plans, critical technologies should reach at least a Technology Readiness Level (TKL) 6 by program start, meaning the technologies have been tested in a relevant environment. This stands in sharp contrast to previous programs, which have started with immature technologies, such as SBIRS and NPOESS, and it reflects the implementation of a "back to basics" policy advocated this past year by the Under Secretary of the Air Force. If these programs adhere to the TRL 6 criteria, they will greatly reduce the risk of encountering costly technical delays, though not completely. There are still significant inherent risks associated with integrating critical technologies and with developing the software needed to realize the benefits of the technologies. Moreover, the best practice programs we have studied strive for a TRL 7, where the technology has been tested in an operational environment, that is, space.
- Successful organizations defer more ambitions technology efforts to corporate research departments (equivalent to science and technology (S&T) organizations in DOD) until they are ready to be added to future increments. Both programs have deferred more ambitious technology development efforts to the S&T environment. TSAT, for example, deferred the wide-field of view multi-access laser communication technology, and is contributing about, $16.7 million for "off-line" maturation of this technology

that could be inserted into future increments. It has laid out incremental advances in other capabilities over two increments. Space Radar has deferred lithium-ion batteries, more efficient solar cells, and onboard processing for its first increment, and like TSAT, is contributing toward their development by S&T organizations. At this time, Space Radar has not defined details of an increment beyond the first one.

• Successful organizations extensively research and define requirements before program start to ensure that they arc achievable, given available resources, and that they do not define requirements after starting programs. Both programs have also employed systems engineers to help determine achievability of requirements. The TSAT program has reached agreement on requirements with its users—primarily in terms of what will be included in the first, several blocks of the program and what will not be included. The Space Radar program has instituted several processes designed to achieve consensus on requirements across a range of diverse users. It still needs to formalize agreement related to these processes and also identify key performance parameters. This is important because Space Radar is to be shared by the military and Intelligence Communities—each with different specific needs for the system and very specific roles and responsibilities with regard to the data being produced by Space Radar and its users. It has been reported recently that conflicts in roles and responsibilities have arisen on dissemination of data being produced by a small tactical satellite (TACSAT 2) recently launched by DOD for use by military commanders.

It remains to be seen whether TSAT and Space Radar will take additional steps that successful organizations take lo position programs for success. For example:

• The organizations we have studied do not go ahead with program start milestone decisions if there are still gaps between requirements and resources. TSAT and Space Radar have indicated that they intend to do the same, but there are external pressures on both programs to provide needed capabilities.

• The organizations we have studied hold program managers accountable for their estimates and require program managers to stay with a project to its end. We have made recommendations to DOD to instill similar practices department-wide, but these have yet to be implemented. Further, there are still incentives in place to keep program managers' tenures relatively short. Promotions, for example, often depend on having varied management experience rather than sustained responsibility for one program.

• The organizations we studied have developed common templates and tools in support data gathering and analysis and maintain databases of historical costs, schedule, quality, test, and performance data. Cost estimates themselves are continually monitored and regularly updated through a series of gates or milestone decisions that demand program assess readiness and remaining risk within key sectors of the program, as well as overall cost and schedules. We saw indications that TSAT and Space Radar were using more robust tools to analyze risks, costs, and schedule than programs have done in the past. However, it remains to be seen how these practices will be reflected in official cost estimates. In the past, we have found space program estimates were simply too optimistic and that independent estimates produced by DOD's Cost Analysis Improvement Group were not being used. DOD agreed with our findings and asserted it was taking actions to address them.

ACTIONS NEEDED TO SUSTAIN COMMITMENT TO IMPROVEMENTS

The Air Force's continued efforts to instill best practices on Space Radar and TSAT are good first steps forward addressing acquisition problems in the space portfolio. They represent significant shifts in thinking about how space systems should be developed us well as commitment, from senior leadership. But sustaining these reforms will not be easy. The programs are not immune to funding pressures that have encouraged too much optimism. They are also being undertaken as DOD is addressing shortfalls in critical technical, business, and program management skills. Further, processes and policies key to sustainment and broader use of best practices have not been changed to further reflect the kinds of changes taking place on Space Radar and TSAT.

First, new programs still must compete for limited funding. As DOD seeks to fund Space Radar and TSAT, it will be (1) undertaking other new, costly efforts, including GPS III, SBSS, and AIRSS; (2) addressing cost overruns associated with pro-

grams like SBIRS High and GPS; and (3) facing increased pressures to increase investments in assets designed to protect space systems. In total, these efforts will increase DOD's investment for all major space acquisitions from $5.31 billion to $9.22 billion, or about 46 percent over the next 3 years. Mare may be needed if technical, software, and other problems on current programs worsen. At the same time, investment needs for other weapon systems are also on the rise, while long-term budget forecasts indicate that considerably fewer dollars will be available for discretionary spending in coming years rather than more.

In prior reports, we have stated that, as long as too many programs compete for too few dollars in DOD, programs will be incentivized to produce optimistic estimates and suppress bad news. They will view success as seeming the next installment of funds versus delivering capability within cost and schedule goals. We have recommended that DOD guide its decisions to start space and other weapons acquisition programs with an overall investment strategy that would identify priorities for funding so that space systems that are expected to play a critical role in transformation, such as Space Radar and TSAT, could be prioritized along with other legacy and transformational systems.

Let me take a moment to illustrate why an investment strategy is critical. We have reported in the past that DOD and the Air Force have waited too long to establish priorities or make trade-off decisions. We have also reported that frequent funding shifts have hurt programs that were performing well or further damaged troubled programs. We have also reported cases where DOD and the Air Force have walked away from opportunities to save costs in lot buys or leverage knowledge already gained in legacy programs in favor of starting new programs that promise much more advanced capability but have little knowledge to back up that promise. Today, DOD is on track to cut short the AEHF program in order to pursue TSAT. It has stated it may also do the same for SBIRS to pursue AIKSS. In both cases, DOD would be forgoing savings that it bad already negotiated for lot buys and in effect, paying significantly more for nonrecurring engineering. While these decisions have the potential to enable DOD to obtain advanced capability sooner (provided best practices are followed on the new programs), they should have been made much earlier and more strategically in order to stem investment losses.

DOD's own reports recognize that investment planning needs to be instilled in weapon acquisitions. A February 2007 report, in response to a requirement, in the John Warner National Defense Authorization Act for Fiscal Year 2007, outlines steps that. DOD is taking to better prioritize and fund programs.[3] The initiatives include: (1) establishing anew concept decision review to provide decisionmakers with an early opportunity to evaluate trade-offs among alternative approaches to meeting a capability need; (2) testing portfolio management approaches in selected capability areas to facilitate more strategic choices about how to allocate resources across programs; and (3) capital budgeting as a potential means to stabilize program funding. While these developments are promising, we recently reported that such initiatives do not fundamentally change DOD's existing service-centric framework for making weapon system investment decisions.[4] Moreover, it will take some time to determine their success in enabling more effective funding prioritization.

Second, space programs are facing capacity shortfalls. These include shortages of staff with science and engineering backgrounds as well as staff with program management and cost estimating experience. During our review this year, the TSAT program cited shortages of space acquisition personnel as a key challenge that increases risk for the program. Due to broader Air Force cuts in workforce, the program did not expect to be able to fill technical positions needed to accompany plans to ramp up spending. During our review of DOD's space cost estimating function, Air Force space cost estimating organizations and program offices said that they believed their cost-estimating resources were inadequate to do a good job of accurately predicting costs. Because of the decline in in-house cost-estimating resources, space program offices and Air Force cost-estimating organizations are now more dependent on support contractors. At 11 of 13 program offices we informally surveyed, contractors accounted for 64 percent of cost-estimating personnel. This reliance raised questions from the cost-estimating community about whether numbers and qualifications of government personnel were sufficient to provide oversight of and insight into contractor cost, estimates. In addition to technical and cost estimating skills, DOD and GAO studies have also pointed to capacity shortfalls in program manage-

[3] Department of Defense, Defense Acquisition Transformation Report to Congress (Washington, DC, 2007).

[4] GAO, Best Practices: An Integrated Portfolio Management Approach to Weapon System Investments Could Improve DOD's Acquisition Outcomes, GAO–07–388 (Washington DC; March 30, 2007).

ment. According to DOD's Young Panel report, government capabilities to lead and manage the space acquisition process have seriously eroded, in part because of actions taken in the acquisition reform environment of the 1990s. During our 2005 review of program management, we surveyed DOD's major weapon system program managers and Interviewed program executive officers, who similarly pointed to critical skill shortages in program management, systems engineering, and software development. The Air Force and DOD recognize these shortfalls and are taking actions to address them, but these will take time to implement. It is important that, in the interim, the Air Force identify and take steps to grow or retain skill sets that should be organic, such as highly specialized knowledge of certain military space technologies. During both our cost estimating and space system reviews, program officiate noted that it can take several years for new technical staff to build knowledge and skills unique to military space.

Our past work has also pointed to capacity shortfalls that go beyond workforce. For example, in 2006, we reported that cost estimation data and databases are incomplete, insufficient, and outdated. In our testimony last year, we pointed to limited opportunities and funding for space technologies, and the lack of low-cost launch vehicles. It is our understanding that the Air Force and DOD are working to address all of these shortfalls. Budget plans show, for example, an increase of nearly $11 million in funding for the space test program beginning in 2009—about 23 percent.

Last, policies that surround space acquisition need to be further revised to ensure best practices are instilled and sustained. For example, DOD's space acquisition policy does not require that programs such as TSAT and Space Radar achieve a TRL 6 or higher for key technologies before being formally started (KDP B). Instead, it is suggested that TRL 6 be achieved at preliminary decision review (KDP C) or soon after. Given that there are many pressures and incentives that are driving space and other weapon programs to begin too early and to drive for dramatic rather than incremental leaps in capability, DOD needs acquisition policies that ensure programs have the knowledge they need to make investment decisions and that DOD and Congress have a more accurate picture of how long and how much it will lake to get the capability that, is being promised In addition, although the policy requires that independent cost estimates be prepared by bodies outside the acquisition chain of command, it does not require that they be relied upon to develop program budgets. Officials within the space cost estimating community also believed that the policy was unclear in defining roles and responsibilities for cost estimators. We continue to recommend changes be made to the policy—not only to further ingrain the shift in thinking about how space systems should be developed, but to ensure that the changes current leaders are trying to make can be sustained beyond their tenure.

In closing, we support efforts to instill best practices on programs like Space Radar and TSAT. They are critical to enabling DOD to break the cycle of space acquisition problems by matching resources to requirements before program start. We encourage DOD to build on this momentum by extending a best practice approach to its entire space portfolio. For newer efforts, such as AIRSS, this means reexamining requirements and alternative means of satisfying those requirements and clarifying the true purpose of the program. For current programs, such as SBIRS, this means continuing to track risks and dedicating resources necessary to mitigate those risks, leveraging management tools such as earned value management, analyses, and finding ways to incentivize contractors to perform well. For the broader portfolio, this means ensuring programs have all the right resources to enable success. These include adequate levels of funding accompanied by short- and long-term investment plans, adequate skills and capabilities, as well as data, policy, and processes, accountability and leadership support.

Senator BILL NELSON. Dr. Sega, why don't you comment on that critique?

Dr. SEGA. I can comment, Mr. Chairman, from the time that I have been the Under Secretary of the Air Force, which is since August 2005. We did see many of the characteristics that have been highlighted by the last set of comments from the GAO. I think we've made progress on those issues across the front. In the case of GPS IIF, for example, as we dug into GPS IIF in the fall of 2005—I wasn't happy with how that program was proceeding. But, with Government and industry working together, we addressed the

technical, management, and financial issues in and around the IIF program. Changes were made.

We had, actually at my request, extended the fixed price option time deadline for satellites 10 through 12 from December 2005 to March 2006 and then to June 2006. By the time we had gone through this extensive work, Government and industry had completed a thorough Integrated Baseline Review from May into June 2006. At that time, I was satisfied we were on track and we executed the fixed-price options for satellites 10 through 12. It took a lot of work. That is one example where we have looked at it in detail—at the Work Breakdown Structure Level—and did it rigorously and in a disciplined way to see ourselves through to the end.

IIF is now on track. You have to pay attention, though, every step of the way. It was not designed from the beginning with a back-to-basics approach. We're working hard on events that are going to occur in 2007, in terms of thermo-vacuum tests and things that are upcoming for that particular satellite as we go forward. It is on track, but there are many things to watch as we go forward—you pay attention to those milestones.

SBIRS High was a similar situation. Our last review with Secretary Krieg on March 20 of this year out in Sunnyvale, California, looked through some of the SBIRS activities. There was a bit of erosion in the areas that were highlighted—but not any what I would consider show-stoppers there. It did not have an engineering development unit that we are now enforcing in our programs, or a starting point upon which you build the flight unit that has more fidelity in it.

However, at this point we think we, once again, are at a point where we have to pay attention and go through some of the additional testing. Clearly, the management reserve is divided into two parts: some of it is in the contractor's line, and some of it is in the Government's line. The Government line of management reserve, actually, ends up kicking in, in fiscal year 2009 and out. But, we're paying attention to that and so, yes, there are some challenges, but not something that can't be overcome and dealt with for an approximately on-schedule launch of the SBIRS GEO–1 satellite. So, I agree.

The "back-to-basics" approach is succeeding (we instituted this plan going forward) to add additional discipline into our systems. Some of the systems that were begun principally in the 1990s are those that we have to work hard on to get them to the point where they'll fly and deliver that needed capability.

Senator BILL NELSON. Okay. As a courtesy to Senator Thune and Senator Inhofe, we're going to flip it to you, let you go on and ask your questions.

Senator Inhofe?

Senator INHOFE. Thank you, Mr. Chairman. I do appreciate that very much. I do have some conflicts.

Let me thank you, both of you, General Chilton and Secretary Sega, for coming up to the office and talking about some things. You probably have a pretty good idea what my concerns are and what I'd like to ask you and get on the record.

Without getting into something that you'd have to go into a closed session, I expressed to you my concern as to what happened

when the Chinese knocked down one of their own weather satellites last January, in the same orbit that we would have our reconnaissance satellites.

I'd like to, first of all—even though I think I know what your answer is—ask any of you what you think the motivation was to do that? Why?

General CHILTON. Sir, we talked about this yesterday. I do not know why. It would be purely speculative for me to do that at this point.

Senator INHOFE. Any other comments on that?

Admiral MCARTHUR. Yes, sir. I would like to add, first of all, it was totally irresponsible of the Chinese to do that. But second, there's a strategic message involved with this. They're seeking parity in space in that particular region. They're challenging us in information operations. They understand that the information domain is the primary domain of the battle space. They wanted to exhibit and demonstrate their capabilities.

Senator INHOFE. Their capability that if something should happen, like in the Taiwan Straits, that we would not have the capability of seeing what is going on there?

Admiral MCARTHUR. There is that, some potential of degradation of our systems. But, we have a multi-pronged approach to overcome, or at least to counter that. It may incur more risk for our forces, but without a doubt they understand, particularly in the Navy, our dependence on space.

Senator INHOFE. All right. I was shown a picture I didn't have when you were in my office yesterday. This shows apparently a 10 percent increase in space junk as a result of this little exercise they did.

Would you explain to us what threat that is or how that might affect us adversely?

General SHELTON. Senator, space is vast to start with. So, there's a lot of things that are there, but this certainly increases the risk to all space-faring nations. So, as this debris is created, there's some that went higher than the orbit that the engagement occurred at, there's some that's lower, but it will take decades for that debris to, literally, rain down out of those orbits and enter the earth's atmosphere. So, even though the probabilities, the estimated probabilities may look fairly low, when the event occurs, the probability is one. So, I don't take a whole lot of solace in the fact that the estimates say that it's——

Senator INHOFE. When those of us who are not as well-informed looked at how infinite space is, you wonder if that can be a problem. But, apparently some do believe it could be.

Then, just some of the statements that were made yesterday, it was in one of the newspapers, written by Edith Linder, that a senior Chinese official predicts weapons will be deployed in space. You hear these things all the time. Any of you in an open meeting want to comment as to some of these statements that keep resurfacing over and over again?

General CHILTON. Sir, I'd just comment that it's curious that when you read these statements from the Chinese, including statements of their interest in participating, for example, in the International Space Station Program, and you hear those words—and

then you observe their activities of actually increasing debris in the orbital altitudes where the International Space Station operates at, what we're hearing doesn't sync up with actions. The actions, I would agree with Admiral McArthur, don't make sense and are irresponsible.

Senator INHOFE. Lastly, let me just ask you the question as to how incremental funding would help you in the situation that you're facing right now, probably you, Mr. Secretary.

Dr. SEGA. I'd be glad to address that.

Some of our systems, as we go forward, are very large, expensive, and take some time to build. Others, as we go forward in operationally responsive space are on the smaller side, and take less time to build.

I'd like to focus on some of the larger satellites.

In our current rules, in terms of what we need to follow, the first two satellites can be built with research and development (R&D) types of dollars. But, after that satellites must have full funding. So, the large, expensive satellites and those that we're not going to build very many of, fall in this category. I would like Congress to consider the approval for incremental funding of those satellites.

Now, these capabilities that I mentioned—in terms of missile warning, strategic communications, and position navigation and timing—we are going to do those for the foreseeable future. If we had the opportunity for incremental funding, in that larger type of satellites—the more expensive satellites—those that we're going to build fewer of—then we could smooth out the funding and have greater efficiencies—in my belief—in terms of how we develop our investment portfolio in those capabilities, develop a rhythm of delivery to the warfighter, and delivery of production, and not perturb another part of our acquisition program that we also want to have investments.

For example, as we are looking at a decision going forward on SBIRS GEO–3 to be made this summer, in the event that it is decided to do that program, then we're looking at almost a full cost bill of about $1 billion in fiscal year 2009, even though it will take some time to actually build it. Now, the authority for incremental funding is present at the National Reconnaissance Office (NRO) for similar satellites. It's present in our NPOESS system that we are doing in conjunction with the Department of Commerce, and it's present for our carriers in the Navy. So, it's in that class of satellite that we would appreciate considerations for incremental funding.

Senator INHOFE. Yes, I'm glad we had a chance to bring this up. I was going to ask the next question about the NRO, since they can do it, which probably is more appropriate, if you ask me the question. If they can do it, why can't you?

Ms. Chaplain, do you have any thoughts about that incremental funding?

Ms. CHAPLAIN. I would comment that if this kind of approach were adopted, that there should be other mechanisms in place to help assess investment progress and what's happening with it on an annual basis. For example, you could be asking the Air Force each year to identify the cost overruns, the causes for cost overruns, what's being done to address cost overruns, and trades that

could be made within the portfolio or outside the portfolio to address funding gaps. So, you would have this other measure that would help smooth out funding, but you still need some tools to have insight into what's being spent, what may need to be addressed in terms of cost overruns and things like that.

Senator INHOFE. Thank you, Mr. Chairman. I think this is something we may want to look at ourselves. Because what you're talking about, Dr. Sega, is not any more money, it's how it comes out, what you're getting for it.

Thank you, Mr. Chairman.

Dr. SEGA. That is correct, sir. I think the management of that will be beneficial from delivering capability, efficiency, and cost.

Senator BILL NELSON. Senator Inhofe, while you're still here I want you to hear the answer to this question.

General Chilton, the Administrator of NASA, in a hearing in front of another subcommittee that I chair, minimized his answer on the threat of the debris from the Chinese ASAT test. Would you give us your opinion?

General CHILTON. Yes, Senator. I'm in line with General Shelton's answer. If you look at this purely statistically, one might minimize, from a mathematical perspective, the impact of this.

I think also, you have to consider, maybe the context of Dr. Griffin talking about the International Space Station, which was shielded much more heavily than any of the satellites we would put up or the space shuttle, which goes up for a smaller period of time and is exposed to the threat less than the International Space Station. But in fact, this was over a 10 percent increase in the amount of debris that was on orbit.

Dr. Sega and I were on orbit together, or actually this is 2 years before we were on orbit together, in 1994 there were about 8,000 pieces of debris that General Shelton's organization was tracking. We're over 15,000 now, and so space debris is a problem.

The United States has worked very hard with the international community, with the Russians for example, to take measures to mitigate the amount of debris we create on routine launches by putting vent valves on our upper stages so there's less risk of them exploding once they've done their mission and are left on orbit and turning into thousands or hundreds of little pieces as opposed to just one you can track.

So, it is significant, in my mind, that a country would go off and intentionally increase the debris field in an orbital regime, where not only humans operate in, but critical national security space assets for the United States operate in, commercial assets operate in, like Iridium Constellation and other communications satellite. To test and demonstrate that capability, one has to ask, are they considering deploying that and fielding that? Because if you go down that path, and with intent to use, you're not going to be going after a small weather satellite, but some larger satellites and some other satellites that will further exacerbate the problem.

So, I am concerned, absolutely concerned, about the activities that the Government of China conducted with regard to this test.

Senator BILL NELSON. This Senator thinks it's absolutely inexcusable for China to have done this and multiplied the amount of debris. Generally, in all of your private conversations with other

users of space, be it American commercial, be it international commercial, be it partners in space, what have they said to you privately about this fact of a 10 percent increase?

General CHILTON. Sir, I have not had conversations with commercial users with regard to that increase. I can tell you, though, that my experience shared by you on orbit, is that manned space flight is not interested in operating in environments with increased debris. Because what General Shelton can see with his sensors, we closely coordinate with NASA to make sure they can maneuver and avoid.

What worries me most is what we can't see. On every single space shuttle flight I was on, the three, after landing we had to replace windows in the space shuttle orbiter from hitting very, very, very small pieces of debris, paint fleck size pieces of debris. They cause enough damage to damage the thermal-pane outer window on the space shuttle, which is not a big cross-section to be dragging through space.

So, I can't emphasize enough my concerns about the increasing debris in this regime.

Senator BILL NELSON. If a paint chip will do that much damage to the window, what would a bolt do, coming at a 90-degree angle?

General CHILTON. It certainly has the capability of destroying a satellite.

Senator BILL NELSON. General?

General SHELTON. We're concerned about anything, probably in about the three centimeter size or larger being catastrophic to our space craft. We are tracking 1,700 pieces, roughly, from the Chinese ASAT test right now. Our modeling says there are tens of thousands of pieces larger than one centimeter. So, if you look at orbital velocities and even those small mass objects, they cause catastrophic damage if they occur at the angles that you talked about. It's all dependent on geometries and orbital velocities, but that's the potential.

Senator BILL NELSON. Do the commercial users of space have an appreciation for this subject?

General SHELTON. Yes, sir. Again, only the objects we can track. But, of those objects we can track, we are tracking the potential collisions between pieces of debris and all the satellites that are in the things that we have in our space catalogue. When it appears that we will have one of these conjunction opportunities, we call that commercial provider and we tell them that it's going to be this close by our estimates.

Senator BILL NELSON. Where is the outrage among the commercial users as a result of this spreading of debris?

General SHELTON. Senator, the outrage is there. It may not have become public. As you go to various symposia, you hear it from the operators. They are very concerned.

Senator BILL NELSON. Anybody else want to comment on this? Okay.

Senator SESSIONS. General Shelton, how much of a burden has been put on you to track those additional debris pieces?

General SHELTON. It's not the tracking, Senator. It's really analyzing the tracking data, and predicting those conjunction opportunities. That's a tremendous burden on our people. Our systems

aren't automated enough that it just spits that out for us in a routine way. It takes an analyst to take the data offline and look at it very closely. So, it is a burden.

Senator SESSIONS. I thank the chairman for raising this directly, because I just don't think it's a good citizen act by the Chinese Government, I think we should be forceful and clear about our concerns and I thank you for expressing that.

Senator BILL NELSON. The Chinese have put up two Taikonauts. They're at risk too and that's human, not even to speak of their government assets that they have up there, so I think it's time for some of us to start speaking out and making it really clear to the Chinese just what a dastardly act that they've done. They can do their ASAT stuff and show their technological prowess, but when you start messing around, completely polluting space, that it becomes a hazard for both man and machines, then it's a different thing.

Senator Thune.

Senator THUNE. Thank you, Mr. Chairman.

I want to welcome the panel before us today. Thank you for your very important service to our Nation.

We are a Nation, of course, that's heavily dependent upon our satellite system, not only for the day-to-day capabilities, communicating instantaneously around the globe, but even providing driving directions to our cars so that we can get places instead of getting lost. There have been a lot of advantages, obviously, and few things are more important, however, than the tremendous capabilities and advantages our satellites provide to our military and intelligence communities. As such, they're very important to the national security of the United States.

As has already been touched on, we now know that these capabilities are held at risk after the Chinese test of an anti-satellite missile and have to work even harder to preserve and expand our space programs. I think this hearing is important in that regard because it will help us better understand what those challenges are and how to overcome them. I appreciate Chairman Nelson and Senator Sessions for having the hearing today.

Dr. Sega, you mentioned in your opening statement that one of your key priorities was not having a gap in missile defense capabilities. When the Airborne Laser (ABL) becomes operational, it will be an Air Force asset. One of the unique aspects of the ABL is its ability to engage in the missile defense fight without the help of satellites. It is a stand-alone platform that can track and destroy all classes of ballistic missiles, and can also communicate with other defense platforms that do rely on satellites. So, I guess the question is, as the Under Secretary for the Air Force and the Executive Agent for Space, can you comment on the usefulness of having that kind of an autonomous, highly mobile platform available that would bring to flight, given its capability to operate independently and operate with other platforms if we had a problem or attack on our missile defense satellites?

Dr. SEGA. Senator, I'll start it in terms of the capabilities, then I'll hand it off here to my left. We're trying to provide options, going forward, and in an uncertain world we think that's important. One of the characteristics that we do know about the 21st

century is the rate of change of technology will increase. So, as we build satellites, we're not building them in isolation, nor are we with our airplanes, but rather we are looking at how they complement each other. How in this sensing realm, we can mutually cue one sensor on one satellite and then pass to other systems that may take action.

I think there is a value in having robustness and options as we go forward. But, the specifics, with respect to how that would fit into an operational construct, I will pass it over to General Chilton.

General CHILTON. Senator Thune, thank you. I don't mind being corrected 100 percent on this, but I think that just like every one of our other missile defense systems, I think ABL will require the initial tipping and cueing that is provided by our space-based sensors, like the DSB Constellation and the SBIRS Constellation, which can see a launch of a missile anywhere on the planet, which is so cued to first get sensors looking in the right direction. So, warning, launch in this direction, this azimuth, turn and look, and I think that is where ABL can be brought to bear. But, I'll follow-up on that to make sure I'm 100 percent right on that, Senator.

[The information referred to follows:]

To follow-up on my answers concerning the Airborne Laser (ABL), I provide the following comments to correct the record. The ABL does not require any off-plane cueing; it is equipped with infrared sensors that will detect and track a boosting missile a full 360 degrees around the airplane. In fact, it can provide cueing to other platforms for missiles not within range or not engaged.

General CHILTON. The other thing about ABL, if we can prove that technology, it's a tremendous capability that could revolutionize the way we think about protecting air space, either from missile attack or other forces. So, it's an interesting technology that's being pursued there by the Missile Defense Agency (MDA).

Senator THUNE. One of the things that's a question that's always raised, and the Congressional Budget Office—as part of their recommendations of places that you can save money—was to do away with the program. But, it seems like, from the types of capabilities that it has in accordance with some of our other assets that it could really be a useful tool. If you have some information, my understanding was that it could operate independently of satellite.

General CHILTON. I'll follow-up on that, Senator.

Senator THUNE. Yes, I'd be curious to know if that's in fact true.

General CHILTON. Sure.

[The information referred to is mentioned above.]

Senator THUNE. So, I guess it seems like, from the Air Force's standpoint, from a national security standpoint, it would make sense to continue to provide funding. It is, I think in the testing phase, obviously they've had a lot of success with it so far. Dr. Sega, could you comment on, with regard to whether or not that's something you believe we ought to continue to look for a way to fund?

Dr. SEGA. I believe that's in the MDA budget at this point. I don't know the trades they are making or if they had to fund one versus another. From the responsibility I have to help oversee some of the R&D activities in the Air Force—previously, I was Director of Defense Research and Engineering—we want to advance technologies, to advance options going forward, but I'm not sure exactly

where they are in terms of their budgets and trades that they were making.

Senator THUNE. Anybody else?

General SHELTON. Just from a STRATCOM perspective, sir, ABL is very interesting technology and STRATCOM wants to see it succeed.

Senator THUNE. That has been my impression. I know these become hard decisions when you have to figure out one platform or weapons system versus another in a tight budget. I'm of a mind that we need to increase the overall budget for the military because I don't think we're going to be able to maintain superiority in some of these areas if we do fall behind. I would hate to see programs like this be sacrificed because of budgetary considerations.

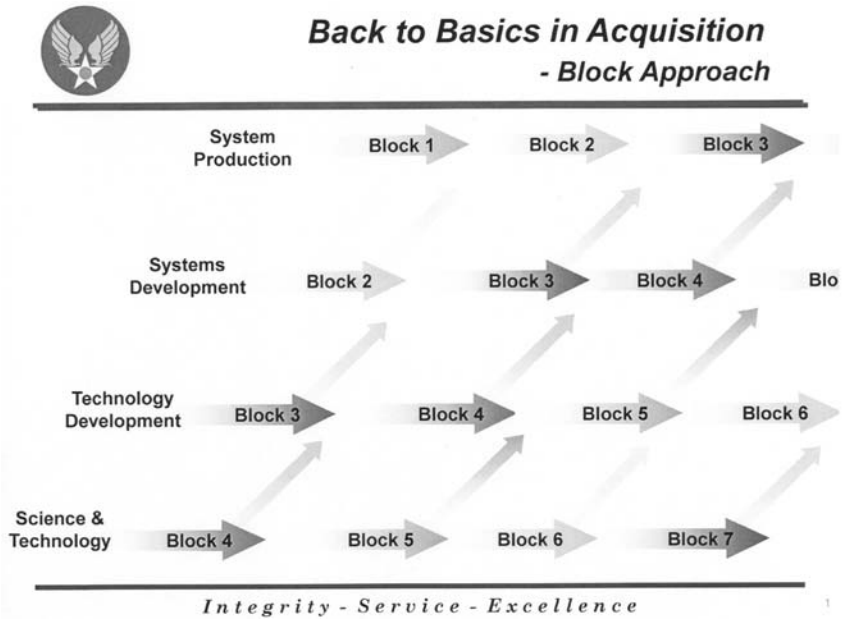
Just one other question, if I might. I think as a general proposition, we have to continue to look to exploit and expand the advantages that we have in technology when it comes to defeating our adversaries. But, one of the criticisms that's often mentioned since September 11, is that we rely too much on technology to gather intelligence and focus too little of our energy and resources on gathering human intelligence. I guess because we rely so heavily on our space capabilities, we've become incredibly vulnerable from an intelligence and military perspective, if those capabilities are destroyed. Obviously, the Chinese anti-satellite missile test underscores that vulnerability, and I guess I'd be interested in just your comments or response to that criticism. Dr. Sega, and anybody else on the panel who would like to chime in about their perspective on that, should we be focusing on ways to rely less upon our space capability?

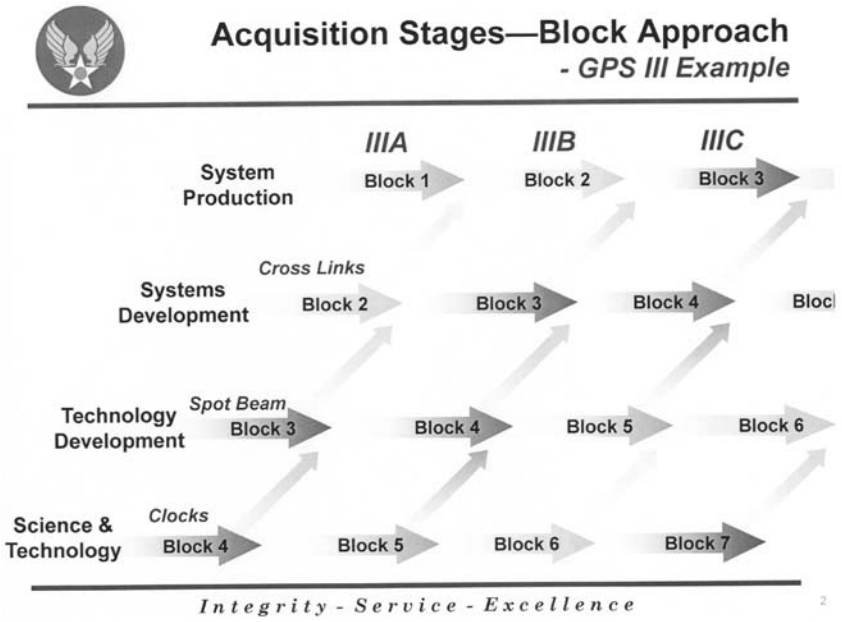
Dr. SEGA. Senator, I'll approach it in terms of the robustness that we are moving toward developing, and then turn it over to others for the trade space and operations.

One of our initiatives going forward is operational responsive space. There's an aspect of using current capabilities in a better way with the ground segments. There's also the development of smaller satellites launched on smaller boosters that can be done more quickly, not only to meet new needs, but potentially to reconstitute a capability after a satellite is no longer working for a variety of reasons, or to augment a constellation and improve the revisit time—you would have more constellations or more satellites in a particular orbit, therefore you would have less time between revisits.

If I could return to this chart here just for a second. If a new idea comes out in this area of S&T, the question is how do you quickly get it to the system production phase, so that it comes on orbit for the warfighter.

[The information referred to follows:]





What we did last year—Congressman Reyes and Congressman Everett were there at the time—was to stand up a wing at Albuquerque called the Space Development and Test Wing, out of the Space and Missile Systems Center. That's the product center—they

do systems development and systems production activities. It's right across the street from the Air Force Research Laboratory Space Vehicles Directorate—they do S&T and technology development. We're bringing together these entities so we can accelerate going from an idea to a fielded system; so we are doing things in a way that we can be more efficient, more responsive to these new needs; potentially also, testing these systems in space—and perhaps incorporating them in larger systems—so you actually check the technologies out in space.

One example of that, is in December we launched our first tactical satellite experiment, TACSAT 2, on a Minotaur booster. We ordered the launcher 7 months prior to actually launching. The goal in that program is to have the satellite actually doing its job after just a couple times around the Earth, being a responsive payload.

We invested in these kinds of capabilities. From 2001 to 2005, we doubled the S&T investment in space-related activity and now we're starting to bring it on orbit. So, the ability to reconstitute, to at least have some capability—may be not as good as the original but not have zero—is one of the goals or one of the options that we're bringing forward. So, we're looking at the road ahead and seeing again what options we could have to bring forward to the warfighter.

General CHILTON. Senator, I would hesitate to comment on how the Director of National Intelligence balances portfolios for collecting the intelligence we need for our fights between human technical sides. However, I would, if I could, comment on intelligence related to space and that within the Air Force portfolio.

I believe we were in a better position to analyze and examine the capabilities of potential adversaries before 1991 than we are today, because we had a real threat in the Soviet Union, who was investing heavily in counter-space and space technologies that mattered if we ever were to come into the conflict with them that we so dreaded.

When they collapsed in the early 1990s, we no longer had that need. What you saw is a decrease in the human capital side, those who paid attention to that. It was probably appropriate during that decade that we do that. But, now as we look to the future, it's no longer just us and another country in the domain. It's multiple countries in the domain that are increasing and accelerating in their capabilities. China is a classic example. We are focusing in the Air Force in the A–2 Directorate under General Deptula, and in Space Command we're encouraging him along the way to increase that human capital investment and make sure we're looking to the future and developing the intelligence analysts and specialists we'll need at institutions like North American Air Sovereignty Intelligence Capability as we go into the future.

So, thank you, sir.

General SHELTON. Senator, I just wanted to comment on the ASAT test directly and the response to that. There's a two-pronged approach you can take. To deal with the ASAT threat directly, and we're certainly looking at that, but then also to look at preserving the capability that is threatened by the ASAT. That runs the spectrum of capabilities that we have, airborne collection, both manned

and unmanned, ground-based collection capability, ship-based collection capability. So, we're looking at all those things to ensure that we don't have all of our eggs in one basket, so that one cheap shot wouldn't hurt us.

Admiral MCARTHUR. Sir, to offer a different perspective on this, the Navy feels like the National Strategy for Maritime Security is a mandate for us developing and deploying capabilities and affects. A big part of that is maritime domain awareness. Maritime domain awareness, the architecture to support that important element is space sensors. Not only space sensors, but communications to be able to reach back to databases and analysts who develop that operational picture.

There is a balance in terms of space and other systems, but without a doubt, space is essential to us for maritime domain awareness. Part of that will be provided by ORS and we're looking at the Automatic Identification System (AIS), which contributes to maritime domain awareness as part of the TACSAT Program that Dr. Sega briefed. So, important to us, essential, and again, a critical interdependency from Navy to the joint space community.

Senator THUNE. Thank you.

Thank you, Mr. Chairman.

Senator BILL NELSON. Senator Sessions?

Senator SESSIONS. Thank you, Mr. Chairman.

Dr. Sega, you mentioned operational responsive space in a 7-month timeframe, what's your goal in terms of being able to launch a system to fill a need in years to come, in the near future, let's say?

Dr. SEGA. I'll approach the first part and then hand it over again. From a technical point of view, if you had a more common bus structure and parts that were available, then going from a need to the assembly of that system should take less time. If you could anticipate a satellite that you would want to have ready for orbit, you could actually be able to build it and store it and have it available.

The launcher that we used for the TACSAT 2 experiment out at Wallop's Island was actually part ICBM Minuteman III-based. A Minuteman III's response time is very fast. If you already have the spacecraft on the booster, then it's a matter of minutes and one could launch—if that was your goal. So, we will bring the technical capability and the acquisition approach to respond faster, and look at smaller satellites being able to accomplish the job.

Now, the actual experimentation that we're doing, not only includes the technical result, but also how it fits into the operations. So, we're exploring that as well. With that, I'd like to turn to the operational impact that could be presented by a TACSAT type of capability.

General SHELTON. Yes, sir. Senator, one of the things we're experimenting with here, is giving a combatant commander direct access to tasking rather than going through the National Intelligence Community for tasking assets, giving them direct access for tasking, and then they get direct reports back for the data as well. So, a very interesting experiment, much like we do with airborne intelligence surveillance reconnaissance today, we're just taking that concept up to space and seeing if it will be effective.

Senator SESSIONS. But, you're getting serious consideration and working to develop a system by which we can replace a missing capability in short order with the least cost. Is that the overall concept of this program?

General CHILTON. Senator, that's what the combatant commander and I don't want to put words in your mouth, General Shelton, so correct me here, but as I said, they're looking at two fundamental areas. That's what we're exploring. The ability to augment if we need additional information or additional capability, even in peace time or in times of heightened tensions, or replace critical assets. That's in the TACSAT Program, right now, that we're executing. I think it's important because we're being able to answer the military utility question of these types of satellites.

What I would like potential adversaries to understand if we're successful in this area, is that even if they go after capabilities that are on orbit today, we will be responsive enough, either through responsive launch capabilities or perhaps other capabilities that General Shelton referred to, air breathing or other, that they will still lose in a conflict. That in itself can be a deterrent to going after what we have on orbit today.

If I could just comment on one other thing, because the operational responsive moniker often gets under some folks' skin and we, perhaps, could have thought of a better thing, and will. Because we've never put out a requirement, either myself or Dr. Kerr, that said, would you please build me a non-responsive space system. Every one of our space systems that are on orbit today are responsive and I salute the people, both in the NRO and in our organizations and Space Command, and General Shelton wearing his warfighter hat, are always looking for ways to milk every ounce more capability out of them.

What we're talking about in this construct, is can we build capabilities in less than 10 years? Can we get a booster that we don't have to order 2 years in advance? Can we get a system on orbit that takes less than 6 months to check out, such that at the end of the day it meets the needs of the warfighter, the Joint Force Commander in the regions around the world? That's the way I contextualize this responsive desire of the combatant commander and that's what we're focused on developing right now in Air Force Space Command.

Senator SESSIONS. I think it is a valuable capability and it made sense to me from the beginning, but I think it's a real need and needs to be as quick as we can make it.

Dr. Sega, why did the Air Force reduce the planned funding for space by $400 million? What are the higher priorities that caused you to redirect that? How do we keep the Air Force from raiding, again, the space budget?

Dr. SEGA. The space budget this year—I'll present it in a couple of ways. In terms of the percentage of the modernization accounts from the Air Force, in 2007, as we submitted the budget request, space represented roughly 17 percent of the Air Force's modernization account. In 2008, space represents roughly 21 percent of the Air Force modernization accounts. Also in our budget, there is the move of funding from one part of the Air Force budget that's reflected in the numbers that have the space radar moved to the De-

fense Reconnaissance Support Activity account. So, there are two pieces, in terms of the monies.

Now, in terms of the programs whose funding moved up and down. One of those, in addition to the radar line being removed, was the TSAT, and in that line the satellite launch date was moved approximately 1 year, to 2016. So there was a reduction there.

Increases occurred to provide the missile warning piece and some of the early items that may be needed for SBIRS GEO–3, and SBIRS HEO–3 and –4. There's a lot of money in front-end loading of that acquisition and that's where the incremental funding would help. So, we put money in there as well, and also increased money into AEHF. There were other adjustments, but those were some of the major ones.

General CHILTON. Senator Sessions, if I could comment as well, sir, on the concept of the Air Force raiding the space budget. I'm the Air Force Space Command Commander and I fight in the corporate process alongside the other Major Commanders for how we invest in our various programs.

Senator, I can tell you that I have not seen better support in the last few years that I've been in, both the programming world as the Air Force programmer or in the space business, than I've seen in this past year. The fact that our Air Force is challenged with recapitalization in its air-breathing fleet and our ancient aircraft that we're continuing to fly and need to replace. When I look at those challenges our Air Force has and then I look at our recapitalization needs in the space business, we are nowhere in the problem that we are in the air-breathing side because we have invested well. The Air Force has taken hold of their responsibilities to make sure there's uninterrupted—not only uninterrupted missile warning GPS, precision navigation and timings, communications, and weather—but, we're even investing on advancing the ball on those and improving the capabilities.

Senator SESSIONS. While you suggest that, presumably we've thought differently.

General CHILTON. I'm sorry?

Senator SESSIONS. Presumably we've thought differently about the aircraft issue and space and the critical need to keep our space capabilities the way we want them to be. So, I'm not sure that I would buy that, but it's a point I'm sure others agree with you on.

But, we are going to see some move, it looks like, close to $9 billion by 2009. Is that the figure I have? For the transformational satellites, space-based infrareds, space tracking, space radar, polar operating, polar orbiting operational environmental satellite systems, will be increasing substantially in the years to come. We think that should be the policy of the Government. I think that's what we have put forth.

Let me ask you this. Tell me about the acquisition workforce. I guess we're talking about an Air Force that's working hard like so many businesses are doing to be as lean as it possibly can be and we're talking about maybe a 40,000-person reduction in workforce. That can be a real billpayer for some of the things we like, if you can achieve that without damaging the Air Force and the responsibilities we have.

Dr. Sega, General Chilton, let me ask you, how can we ensure that we retain the workforce needed to successfully deliver on these programs, including systems of engineers, program managers, and technical experts, as I think there's a growing consensus in Congress and, actually, in DOD that we need more in-house expertise as we seek to manage in a cost efficient way the development of new programs?

General CHILTON. Senator, if I could comment on that human capital that the GAO commented on too, and I don't disagree with the issue that we're concerned with. I think we got off the track and I think we've admitted this and we understand this, not just in the space business, but in all acquisition business in the late 1990s with our total systems performance approach to doing business. We stepped back, abrogated our responsibilities on the Government side, and what we created in doing that was a bathtub of expertise in middle management at the major and lieutenant colonel year group levels right now in our Air Force. A lot of those people looked uphill at the end of the 1990s and said, "I don't see a future here with this management program," and they went to industry or left our Air Force.

So, we recognize that as a challenge, and unfortunately we can't make those people overnight. You have to grow them. That's why we're so focused on, as we move to the future, how we, not only recruit, because I think there's talent out there that we're, I know there's talent, we'll compete with industry for coming out of the universities. But, then also, grow and mature people so that 5, 10 years from now, when I go looking for a GPS Program Manager to go work at SMC or someone to work the development of a next major program, I've raised them and given them that expertise they need to lead in that area.

But, your concerns are valid and they're ones that we are focused on addressing and that is that core middle management that left our Air Force at the end of the last year.

Senator SESSIONS. Have you formed an opinion about what percentage and how we should strengthen that capability of management of programs, with regard to uniformed personnel and civilian personnel?

General CHILTON. It's interesting to look at the balance in that area. We are looking at some military to civilian conversions out at SMC to boost the number of civil servants we have in the programs and try to recruit and bring in some of that mid-level talent in those areas, that will provide some stability and leadership in the interim. We're about 50/50 in our civil servants and military workforce out at SMC.

If you go look at ASC, the aeronautical side or the electronic side, it's quite a substantial difference. There is a much higher civilian workforce out there. So, we're taking a look at that balance and how we can leverage the authorities we've been given to go convert some military to civilian positions and grow that, and recruit, I should say as opposed to grow, but recruit the civilian expertise to help us get through these times that we're in right now. But, we are taking the long view too here, Senator, in how we raise and develop people for the future.

Dr. SEGA. Yes, Senator Sessions, I absolutely agree with your points and your concern. I failed to mention in answering Senator Nelson's question he asked me with regard to Cristina Chaplain's comments on the acquisition plans going forward, how it has actually been implemented and institutionalized, it's in the right direction. I did send out a letter to the DOD with regard to back-to-basics and the block approach in space acquisition. In that letter, one of the sentences is: "The foundation of this disciplined acquisition approach is an experienced, high-quality, technically educated Government workforce actively engaged in all aspects of the enterprise." So, I believe it is the foundation going forward.

One of the approaches here, as we mature technology, is also to take a similar approach for at least a fraction of our acquisition workforce, and have a workforce development plan. General Chilton has done that on an individual basis in their database of space professionals. We look at how they get their hands on experience in the early years of their career, say in S&T, and then build up knowledge in terms of their experience toward the complexity of systems that they will have in the future. In this way, they will have developed a technical instinct, as well as management skills, and financial acumen.

Senator SESSIONS. How would you describe that in terms of a change in the way we've done business, how big of a change does that reflect? Anybody, we've heard this talk, we need to go back to more in-house management, the systems will come out better in the long run. You seem to agree with that. How significant of a change are we executing now on your part?

Dr. SEGA. Sir, in my view, the change, from what I understand, happened in the mid-1990s, in terms of having those responsibilities for the systems be placed outside of Government to contractors. What we're doing now is very different. The responsibility of these Government activities needs to be done by Government folks. They are supported by contractors and Federally Funded Research and Development Centers (FFRDCs) and so forth, but that expertise in Government is key. We have more in-plant presence, for example, in some of these programs that you heard of earlier today and that's making a difference. So, I think that discipline includes the workforce on the Government's side having those necessary jobs and experiences so they will be successful in our future.

Senator SESSIONS. I just would say this. We've not been happy with our contracting procedures. Too many things have gone over in terms of cost and time and other things, GAO has pointed this out repeatedly. I do think your back-to-basics, and the other steps that you're taking seem to already be paying dividends. I really believe you're committed to this personally and I think that's why things are moving. Without your personal leadership, it probably would not. You have to clear the way for General Chilton sometimes too, so he can do the things they'd like to do.

Ms. Chaplain, would you want to comment on any of those subjects?

Ms. CHAPLAIN. Yes, I have several comments. I appreciate the actions DOD and Air Force are taking on workforce, but we have concerns about the very near-term workforce that, I think, need to be addressed very soon. You can't wait for these long-term efforts.

Just to give you a couple of examples, we visited the EELV office this year, and learned that 15 people will be retiring in the very near-term, so EELV's transitioning to a new kind of contract, it's trying to do a lot of things with those programs. Does it have the kind of people it needs to manage that effort?

When we visited the TSAT office, we saw considerable turnover from the year before, and a lot of people within that program are just trying to come up to speed. In several of the space program offices and others weapons programs offices, we found that the service-type of contractors, they're helping manage the programs, and the FFRDC's personnel had more knowledge than the Government personnel, they were the ones with the institutional knowledge about the program.

I visited a Navy program office earlier this year, where the program manager told me that he had one guy in the whole Navy who knew about a particular technology regarding sonar caps. He lost that guy to retirement, he hired him back as a contractor. I asked him, "What are you going to do when he goes? Do you have a new sonar cap guy?" He didn't. Finally, the Navy Lab had recognized that, and were going to grow somebody new, but that takes several years. As I understand in space, it takes several years to grow new personnel, so that's on one side where we see immediate needs to address workforce issues.

We also have concerns about the growing reliance on contractors in programs to manage those programs. Issues like, who is really making decisions on the programs come to mind. How is oversight being executed? How is the Government dealing with potential conflicts of interest? So, we have a two-sided concern with workforce that is still on the table.

Senator SESSIONS. Okay, thank you. Mr. Chairman, I'm glad you're back, and I did have a question about the $500 million funding reduction and how that will impact the TSAT and what delays we'll be looking. Maybe we can submit that for the record. I'm finished.

[The information referred to follows:]

The hearing transcript also indicates a question from Senator Sessions about a funding reduction and how that will impact the Transformational Satellite program. Dr. Sega stated that an immediate impact of the reduction would be a 1-year delay in the satellite launch date. We have not assessed the impact of the reduction in detail, but I would add that unanticipated funding reductions may also affect procurement of long-lead items and the ability to obtain and retain critical technical and business skills within the program. As emphasized in our testimony, the Air Force and Department of Defense could reduce the need for funding shifts in space programs by prioritizing its investment decisions and obtaining long-term funding commitments.

Senator BILL NELSON. Okay, I have a few questions, and then what we'll do is recess and we will reconvene in a closed session in Russell 222. Jeff, are you going to meet us over there?

Senator SESSIONS. Yes.

Senator BILL NELSON. Okay.

There's been much criticism of the late 1990s of the policies that let 40,000 people go. Does space, does it need to have an exemption from reduction? For instance, the Air Force reduction that had 40,000 people there?

General SHELTON. Senator, the reduction at the Air Force is on a glide path floor for about 40,000 of end strength from 360,000 down to the vicinity of 320,000, is one that—those reductions were asked to be put in, and laid into the program across the FYDP, and Air Force Space Command took a real hard look at that last year when we were asked to put our share in, because this was divided up across the entire Air Force. We looked at it very carefully, and we believe there are reductions that we will take, are ones that we can continue to sustain our operations and development programs, and that they are reasonable reductions.

I would also point out though, Senator, that our Chief and Secretary have said that given the proposed growth and end strength of the Army, and potential Marine Corps is being considered, I know, by Congress, that the Air Force is going to stop and take a look at future reductions beyond 2009 for the FYDP, and ask the question, if that growth occurs, does that require growth in the Air Force as well, as part of the Joint Team? So, I know the Chief and Secretary have testified that they intend to look at that this summer as they go forward, and perhaps re-address the reductions in 2009.

Senator BILL NELSON. Why do you think the National Security Space Initiative funding is substantially reduced in fiscal year 2008?

General SHELTON. Senator, I think there were competitions for funds, always, and we're focusing on recapitalizing all of our key constellations. It's an area we could use additional help in, I don't mind saying, sir, in two-fold areas.

One, is we're currently renting a facility in downtown Colorado Springs that doesn't have the capacity for this institution, and I would like to see us get on with the military construction of the facility on Peterson Air Force Base where I can alleviate force protection concerns, but also grow the facility to meet the demands. It's been so successful, that the United States Army certifies every one of their FA–40s, their Space Officers, comes through our Space 200 course that's taught at the Nonproliferation and National Security Institute.

The additional funding we could use in this area would also improve not only the seats that we could accommodate, and put through the school, but also the quality of our Space 200 and 300 courses, which I have asked the institute to raise the bar on, to make them a little more challenging, a little more encompassing.

Senator BILL NELSON. Mr. Secretary, will the Air Force complete and have approval of the TSAT requirements by July of this year?

Dr. SEGA. Mr. Chairman, I believe that on the TSAT program we have a system review that's coming up in conjunction with an ICE that's also being done, and that process will go on and be completed by this calendar year. Our target is by the end of the summer, but I'll say that this work on TSAT will be done by the end of the calendar year.

Senator BILL NELSON. So there is some delay, why is that delay?

Dr. SEGA. I don't anticipate a significant delay. The system is in review, and it is important for us to identify on a more detailed level the TSAT program status. The testing that was done on two of the very important technologies—the laser cross-link, and the

next-generation process router—took place here in the last couple of months, and they have been successful. So, both contractor teams have passed on those critical technologies, where they needed to be to go forward. So, our goal is, by the end of this summer, to have that in place. The SDR, and moving toward a review of the cost in the ICE so we're in a better position to go forward.

The first stop is technology maturity, requirements, SDR, and the cost estimation.

Senator BILL NELSON. So, do you think those critical technologies will be done by October?

Dr. SEGA. Sir, what we had required going up to the SDR, by and large, are complete now.

Senator BILL NELSON. What would be demonstrated by October?

Dr. SEGA. In terms of the design work, we went through a series of testing events that occurred at Lincoln Laboratory. On the S&T key technologies, the next-generation processor router and the laser communications, over the last couple of months. That was rigorous testing, and that was our principle look in terms of the technology going forward. Obviously, there's more work to do, but those hurdles were done in the Phase I and Phase II and are nearly complete.

Senator BILL NELSON. What is the backup plan if the fourth AEHF is not reinstated?

Dr. SEGA. Our plan is to complete the work on AEHF I, II, and III, to do the risk-reduction—which we are doing on TSAT—the design, and go forward on the TSAT program with the back-to-basics block approach. We've reduced some of the requirements for the Block I than we had in the full program, so we've reduced some of that risk to increase our confidence that it will be delivered on time, and in our date which we are anticipating launch, on this schedule, with 80 percent confidence after CDR, is 2016. That should not have a gap in capability, and I would refer to General Chilton and General Shelton on that. We're going to need to have synchronization with other needs, as well as continuity of strategic communications. That should be maintained with a launch in 2016. I believe the convergence—the synchronization rate—is approximately 2018.

General CHILTON. That's correct, Senator. As you mentioned, you see in this program the initial launch date of a TSAT system is moved to 2016 from 2015. We took a hard look at actual need dates, and the sweet spot, if you will, on the schedule that was based on user equipment purchases, Army requirements with regard to FCS, space radar requirements with regard to bandwidth, and then also the risk Dr. Sega talked about with regard to gapping critical communications capability, and the sweet spot is 2018. I'm comfortable with a 2016 launch of the first TSAT, I'm not comfortable with the 2017, because it classically takes several months for a first satellite to be tested and checked out, and I think we're right at my comfort limit right now for a launch date of 2016 for that system.

Senator BILL NELSON. Admiral, how important is AEHF, and TSAT to the Navy?

Admiral MCARTHUR. Sir, TSAT is most important to the Navy, and the capacity that it will provide, essentially 10 times of what

we see in the AEHF, the fact that it's protected communications, which we have others, but it's still protected—but most importantly it's the speed at which you can pass data with our ISR systems. Our expectation is 2016, we'll follow through on. We're synchronizing our other programs, the ground segment, the user segment, the ISR systems that, advance systems that we expect to come on board—we're synchronizing them with that date and are satisfied with 2016, sir.

Senator BILL NELSON. Ms. Chaplain, what's your assessment of the progress of TSAT?

Ms. CHAPLAIN. We believe the practices that TSAT is adopting do give you more schedule certainty. But there are still risks in the program, especially down the road when it comes to software that needs to be developed, and integration. So, obviously, the lower-risk investment is to continue with the AHF buy, if you had to make a choice. Ideally, you'd be funding both, and just to keep things on an even keel, and I don't like abdicating cutting a program that's doing well, and trying to adopt best practices, but if you looked at it just from a risk perspective, continuing the AHF would be the lower-risk approach.

Senator BILL NELSON. Mr. Secretary and General Chilton, the news recently indicates there is a debate going on between the Intelligence Community and the military community with regard to the NRL sensor on the TACSAT 2, and that the sensor is not turned on, and the issues is still not solved. How does this issue get resolved, so that the sensor can get tested?

General CHILTON. Senator, I think the issue is a discussion on title 10 and title 50 authorities and responsibilities. I look at the question the same way I would look at a U2 air-breathing intelligence collecting platform, the U2 Dragon Lady that the Air Force operates.

It does optical and radar reconnaissance that supports both the title 50 community, as well as the Joint Forces Commander in the theater that that airplane is operating in. It does the same with regard to signals collection, which can support both the title 50 community, as well as the Title 10 joint warfighter. I don't see an issue that we can't work through about developing space capability along the lines of these TACSATs, or ORS, eventually, when we start talking about an augmentation or a replacement capability that cannot be treated in a similar fashion as we treat our U2s, as we treat our RC–135s which do both title 50 and title 10 work.

Senator BILL NELSON. Is this silly turf-fighting?

General CHILTON. Sir, I wouldn't call it that, I would say there are folks used to authorities and how they operated in the past, and this is really new ground in the space domain. It is something we have worked through in the air domain many years ago, so maybe some folks were surprised by the payloads on TACSAT, we certainly didn't hide those, but this debate is coming up, I think it's one that can be easily resolved.

Senator BILL NELSON. Are we about to miss testing a sensor as a result of this in-fighting?

General CHILTON. Senator, I was not aware about the not being turned on portion that you briefed, I knew there was an issue. So, I might have to defer to General Shelton on that. I know the im-

agery sensor, which takes photographs, is turned on and is going through test and checkout, so I will defer this to General Shelton.

Senator BILL NELSON. Is there a problem, General Shelton?

General SHELTON. Yes, sir, there is. AIS is the sensor that Admiral McArthur referred to earlier, and that has been problematic, and we'll continue to work this, and as General Chilton said, I'm confident we can work through it.

Senator BILL NELSON. Is there this turf battle between the Intelligence Community and military community?

General SHELTON. Again, I wouldn't characterize it as a turf battle, I would characterize it as a new, first out-of-the-box kind of capability where what has been the sole purview of the National Intelligence Community from space is now going into the DOD in a space-based capability. So, working through the authorities, working through the law that exists, it's just going to take some time. So, there are plenty of lawyers involved helping us with this one.

Admiral MCARTHUR. Sir, I would like to say, though, that the Navy is anxious to experiment with a new doctrine and new tactics and techniques and procedures. We made references earlier to combatant commander tasking of sensors, and that's reflected in the initial concept of operations of U.S. STRATCOM for ORS.

We're working within the Joint Space community, with the Intelligence Community to resolve these doctrine of the past, to transform to a new way of doing business. We have forces that are deployed today, standing by to task that AIS sensor when we clear a couple of hurdles. Thank you, sir.

Senator BILL NELSON. Does this need to be drawn to the attention of the head of the Central Intelligence Agency and General Hayden?

Admiral MCARTHUR. No, sir, the resolution of previous doctrine and policy is underway today. We have leadership within the Intelligence Community and the DOD that are working to change and transform. So, we're again, looking forward to experimenting with a new doctrine.

Senator BILL NELSON. So, if you all resolve this, this is going to take care of future TACSATs?

General SHELTON. Senator, that would be our design, is that we get this resolved, and we move forward.

Senator BILL NELSON. If you need a little help, let me know.

Senator SESSIONS. Senator Nelson also runs the Intelligence Committee, too.

Admiral MCARTHUR. This discussion should be helpful enough. Thank you, sir.

Senator BILL NELSON. Let's talk about iGPS. Tell us, are you all familiar with that concept?

Dr. SEGA. iGPS is one of several proposed options for augmentation of GPS. Augmentation takes many forms around the planet in terms of getting additional accuracy—it's done in agriculture—it's done in a variety of other ways. We do it in different ways on the defense side, and iGPS would be one technique toward an augmentation. So it's important to keep our eyes open and look at different options for augmentation, but it's one of a variety of augmentation approaches.

Senator BILL NELSON. Are the GPS terminals, are they going to be compatible with the iGPS?

General CHILTON. Sir, I don't know the answer to that question, I have received a briefing on the iGPS concept, and which is, I think, Dr. Sega described accurately, but I'd like to take that for the record, Senator, and bring you an answer back on that.

[The information referred to follows:]

I do recall from an iGPS briefing that iGPS leverages the Iridium Constellation and the Department of Defense supported the President's budget to develop iGPS capabilities. If you accept this path, then you look at a need to reconstitute the Iridium Constellation, which is not in the current program.

Specifically, to answer your previous question, I submit the following information:

To review, the iGPS industry concept proposes a regional augmentation of GPS that includes the communications capability of Iridium. iGPS envisions use of low-flying Iridium satellites (in 500NM orbits), new reference stations situated in the AOR, as well as iGPS user equipment to deliver improved accuracy, availability, anti-jam resistance, and two-way communications.

Current GPS military user equipment is not compatible with the iGPS concept. New user equipment would have to be designed and fielded, a requirements definition and developmental engineering process taking several years before this capability would be available for the military.

To employ this concept would require building new iGPS reference stations, most likely overseas, where there is force protection and basing issues. The number of reference stations required would depend on the iGPS coverage needed.

The Air Force has not studied the overall iGPS costs; however, the cost of reconstituting the Iridium Constellation is likely to be on the order of $5 billion. User equipment costs would depend on the number and variety of users requesting iGPS service. There are also unknown costs related to modification of the control segment, development, basing and force protection of the additional iGPS reference stations, and an annual service fee.

The time required to operationalize iGPS and its useful life would be contingent on its final scope and concept of operations. The sense of the GPS community is that the GPS IIIB era will be on hand (fiscal year 2016) by the time iGPS would be a fully operational military system. While we have examined iGPS only as a military augmentation system, properly equipped civil and commercial users could benefit if they were in a coverage area.

Though iGPS is a great example of ingenuity, it would only provide military users some additional limited capabilities for a few years. iGPS presents unquantifiable costs with respect to Iridium's LEO orbit with increased vulnerability to counterspace action and increased overseas footprint. Lastly iGPS does not remove the necessity for GPS III, which independent of iGPS, shall meet the full set of military and civil user requirements.

Senator BILL NELSON. I understand there is a problem, and also additional ground antennas or relays would also be needed to make it functional, and of course we'd like to know the cost of the concept, who would use it, when it would be operational, and how long it would be usable?

General CHILTON. Senator, I'd be happy to provide the answers for the record for that. One thing I do recall from the briefing on iGPS is that it leverages the Iridium Constellation, and if you go down that path, then you look at a need to reconstitute that constellation, which of course, is not in the current program.

Senator BILL NELSON. Ms. Chaplain, there are rumors going around that the terminal programs are lagging behind the satellite programs, and that there is also a shortage of terminals. If that's the case, how does it get fixed?

Ms. CHAPLAIN. We've just started looking at this issue ourselves, and we do have questions about the synchronization of the acquisitions, at least in the GPS area, and I know there's a few more programs that we have questions about. How you fix it requires a lot

more coordination between the two efforts, and balanced funding to make sure that they march down the same path. If the terminals lag too far behind, you're missing opportunities to extract new capabilities, and in essence, wasting investments in these new satellites if you can't use them with the ground equipment. So, it's something we're going to be looking at more this year.

Senator BILL NELSON. For example, you can't even utilize the M Code on the GPS satellite, because there are no fielded terminals.

Ms. CHAPLAIN. Yes.

Senator BILL NELSON. What do you think about that, General Chilton?

General CHILTON. Sir, we're just starting to field the M Code on the II–RM satellites right now, we just have three of those up, I believe——

Dr. SEGA. That's correct.

General CHILTON.—five more to follow. So, you're exactly right, Christina, there is a balance that we have to manage between fielding terminals and satellite capability because you don't want to waste capability on orbit.

I'd say, also, the other thing we need to keep our eye on, Senator, is not only the terminals that the user uses, which are classically fielded and paid for by the individual Services that are buying those, in the GPS case, but in our Command and Control element for GPS. This is an area, the AEP program, and the OCX programs that we're very focused on in Space Command to make sure we get that transition to new Command and Control architecture on GPS safely done this summer, and then manage into the future, so that when you have the satellites on orbit, you can even turn on the new capabilities, and make sure we can command and control it. So, it's a multiple-pronged issue that is exactly on mark that we stay synchronized, not only building the satellite element, but the ground element that goes with it, and the user equipment.

Senator BILL NELSON. Thank you. We will recess the subcommittee, and we will reconvene in Russell 222 for a closed session. We are adjourned.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR BILL NELSON

CHINA ANTI-SATELLITE TEST

1. Senator BILL NELSON. Dr. Sega, General Chilton, and General Shelton, in January, the Chinese conducted a successful test of a kinetic anti-satellite (ASAT) weapon. What are the implications for our space programs and what capabilities do we need to improve?

Dr. SEGA. Given the critical importance of our space assets, we must improve our ability to detect space objects and characterize them as quickly as possible. To help accomplish this, the Air Force is currently pursuing upgrades and new capabilities to improve Space Situational Awareness (SSA), such as the Space Fence and Space-Based Space Surveillance (SBSS). Additionally, the Department of Defense (DOD) is expanding its ongoing emphasis on new technology and tactics, and working to develop a surge, augmentation, and reconstution capability through the Operationally Responsive Space (ORS) program.

General CHILTON. Today, our surveillance, analysis, and data-sharing capabilities do not adequately support our emerging needs to rapidly identify and understand the threats to our space systems. We must improve our ability to detect the threat and characterize it as soon as possible—preferably before launch—to give ourselves maximum time to avoid or at least mitigate the risk using all available instruments of national power. We also must improve our capability to detect and evaluate the

risk from all debris, man-made and natural. Our analysts did an incredible job quickly characterizing the debris cloud, but they are constrained by an antiquated computer system, a Cold War-era communications structure, and a patchwork of surveillance systems that were not designed from the ground up to provide the type of SSA we now require.

To that end, we have programs in place which will improve existing capabilities. Space Based Infrared System and Space Tracking and Surveillance System will help us characterize launches and identify potential threats more quickly. Integrated Space Situational Awareness (ISSA) will provide increased accuracy and improved processing over the 1980s-era Space Defense Operations Center computer system. The Rapid Attack Identification and Detection Reporting System (RAIDRS) will enable us to not only detect and assess threats but will suggest potential courses of action to the Joint Functional Component Commander for Space (JFCC SPACE). The Space Command and Control (C2) program will enable JFCC SPACE to respond to threats and execute protective operations while there is still time to defend our systems. The Space Fence, Space Surveillance Telescope, and other Space Surveillance Network (SSN) recapitalization programs will enable us to characterize a debris cloud or other potential threats and assess risk to other on-orbit systems in a fraction of the time it takes today.

Lastly, the ability to posture our space capabilities and effects during and after an event is paramount to maintaining space superiority. We are focused on delivering, deploying, and employing operationally responsive technologies, systems, and associated tactics to augment, recover, and replenish space capabilities for combatant commanders and national defense.

General SHELTON. Implications of the successful Chinese ASAT test include increased risks to manned and unmanned space assets for all space-faring nations. We need to improve the persistent and predictive nature of SSA capabilities (sensing and analyzing), and combine this with command and control capabilities in a timely and relevant fashion to enhance a decisionmaker's ability to determine and execute appropriate courses of action. Deploying and employing responsive space elements to exploit new technologies and operational capabilities, as well as augment or reconstitute existing capabilities, strengthens the perseverance of space effects and provides the flexibility to respond, when and where needed.

2. Senator BILL NELSON. Dr. Sega, General Chilton, and General Shelton, the Air Force unfunded priorities list includes funding for SSA activities. Could you address the need for additional SSA capability and why is it important?

Dr. SEGA. SSA is an increasingly important component of space operations. It includes the ability to surveil the space domain with the goal of identifying and classifying objects in space, in as near real time as possible. The fiscal year 2008 President's budget includes funding for the first SBSS satellite which is scheduled to launch in fiscal year 2009, and should improve our ability to rapidly find, fix, and track orbiting objects. In the future, satellite "self awareness" capabilities will also become increasingly important.

General CHILTON. Preserving our advantage in space is a prerequisite for everything we do. SSA is the foundation for all space operations but in particular for space defense. We can't protect our critical space systems and can't respond to emerging threats without knowing what might threaten them. SSA allows us 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?" The answers to these questions are vital to the commander responsible for operations in any domain.

Today, we are reaching the limits of what our computer system was designed to handle so we need to invest in new system like ISSA. ISSA will handle the growth anticipated in on-orbit population as well as provide the increased accuracy demanded by today's users. Our SSN is a combination of Cold War-era systems and most of the systems are decades old and our surveillance network is in drastic need of modernization or replacement. We have a critical space surveillance sensor gap in the southern hemisphere. We must continue to sustain our current systems while we invest in the Space Fence program and the SBSS. The Space Fence program will give us a quantum leap in being able to detect and track small objects like microsatellites, combined with deploying sites overseas. The SBSS will give us unprecedented abilities to ensure we can maintain custody of objects in orbit. These two programs will fill key shortfalls in our abilities today.

Even as we try to find a way to recapitalize the SSN, we must take better advantage of the information and systems that we have. We need to be able to monitor, collect, fuse, and exploit information from the SSN, missile defense sensors, and many other sources to provide near-real time global awareness to our commanders

so that they can make well-informed, timely decisions. We must continue to sustain our existing systems to avoid gaps while delivering new transformational capabilities.

General SHELTON. Current SSA methods are focused on reactive measures designed to identify, track, analyze, and assess objects within the space environment. The need for additional proactive SSA capabilities enabled by advanced net-centric architectures that integrate data sources and are predictive are necessary to defend our freedom of action in space. The escalating number of objects in, and threats to, our space capabilities, places our national and manned space assets at increased risk. SSA modernization will provide the foundation required to anticipate and respond to the pending accidental, environmental, or intentional threats posed to our space systems.

SPACE DEBRIS

3. Senator BILL NELSON. Dr. Sega, General Chilton, and General Shelton, the Air Force maintains a catalogue of space debris—the Chinese test created thousands of new pieces of space debris. How does that debris affect U.S. military and commercial space programs?

Dr. SEGA. Some of the debris generated from the Chinese ASAT test will remain in orbit for decades and is in the same orbital regime as many United States space assets. Because of this, there is a potential that tracked and/or untracked debris pieces too small to track could collide with an on-orbit satellite. The Joint Functional Component Command for Space (JFCC SPACE) at Vandenberg Air Force Base, California, monitors trackable space debris closely and continues to accomplish conjunction assessments on a daily basis. In this way, they can determine close approaches between the trackable debris and U.S. space assets and recommend these assets be maneuvered, if necessary.

General CHILTON. The debris generated from the Chinese ASAT test will present a risk of collision for decades to come. The pieces of debris created by the Chinese are in the same orbit regime as many U.S. space assets and as such there is a threat that tracked and/or untracked debris pieces could collide with an on-orbit satellite. JFCC SPACE monitors the situation closely and continues to accomplish conjunction assessments on a daily basis to determine close approaches from the debris with U.S. assets.

General SHELTON. Increased space debris creates a tremendous burden on the space professionals tasked with analyzing and predicting conjunction opportunities. Insufficient automation and processing requires an analyst to individually review the data closely once an object has been identified as a possible threat to a space asset regardless of whether it is a commercial or military platform. Post event modeling indicates that the probability of a low earth orbit satellite being hit by debris increased 10–40 percent over a 5-year period. Given the extensive de-orbit timeline for this newly created space debris, its impact on military and commercial systems will be felt for years to come.

4. Senator BILL NELSON. Dr. Sega, General Chilton, and General Shelton, DOD relies heavily on commercial satellite capabilities as does the U.S. economy, will the Air Force continue to provide notification of debris location to the commercial space industry? There is some ongoing confusion about whether funding is available in fiscal year 2008 to do this.

Dr. SEGA. Air Force Space Command (AFSPC) provides space surveillance data to non-U.S. Government entities through its pilot program "Support to Commercial, Foreign Entities (CFE)," as authorized in the National Defense Authorization Bill for Fiscal Year 2004.

Satellite position data, as well as debris data, is made available through the CFE Web site to any registered user. CFE is not funded as a separate line item by Congress, but AFSPC has, to date, funded the 3-year pilot program which is scheduled to expire at the end of fiscal year 2009. Additionally, the Joint Space Operations Center provides notification to U.S. commercial satellite operators when potential collisions with the debris are predicted.

The Air Force currently intends to fund the program in fiscal year 2008 and keep the Web site operational. AFSPC could evolve the existing CFE pilot program from a basic Web site to an improved operational capability that provides advanced services (conjunction assessment, launch screening, anomaly resolution, et cetera) to a wide variety of customers, to include commercial, allied, public, and foreign interests. However, resources are currently not available within the budget for full implementation of the program.

General CHILTON. The National Defense Authorization Bill for Fiscal Year 2004 (signed 24 Nov 03) allows the Secretary of Defense to carry out a pilot program to determine feasibility and desirability of providing non-United States Government entities space surveillance tracking services, data, and analysis. This pilot program is called Commercial and Foreign Entities (CFE) and has been re-delegated from SECAF to AFSPC. The primary goal of the pilot program is to enhance DOD SSA and to meet DOD objectives by providing timely, accurate, and state-of-the-art surveillance services to commercial and foreign entities, as resources permit; and to normalize the processes used to provide this support. Satellite position data, as well as debris data, are made available through the CFE Web site to any registered user. This pilot program is unfunded; however, AFSPC will continue to seek funds to keep the Web site operational for fiscal year 2008.

General SHELTON. AFSPC provides space surveillance data to non-U.S. Government entities through its pilot program "Support to CFE." No specific "debris notification" is proactively issued to commercial space industry, but ephemeris data is made available through the CFE Web site to any registered user. CFE is not funded as a separate line item by Congress. AFSPC has voluntarily funded the 3-year pilot program scheduled to expire at the end of fiscal year 2007. Fiscal year 2008 funding is undetermined at this time. USSTRATCOM would like to see the Air Force continue this program and mature its capabilities, while preserving operational security of ongoing space operations.

5. Senator BILL NELSON. Dr. Sega, General Chilton, General Shelton, and Admiral McArthur, continuing with how to respond to the debris issue, do you believe it is time to look at additional international solutions to controlling and mitigating debris?

Dr. SEGA. The existing legal regime, including treaties, adequately addresses the issue of orbital debris. The United States is taking a leadership role in international fora to encourage foreign nations and international organizations to adopt policies and practices aimed at debris minimization. The United States also seeks to minimize the creation of orbital debris by its own government and non-government operations in space, as is outlined in the President's National Space Policy.

General CHILTON. The existing legal regime, including treaties, adequately addresses the issue of orbital debris and new legal solutions are not necessary. The United States is taking a leadership role in international fora to encourage foreign nations and international organizations to adopt policies and practices aimed at debris minimization. Of course, the United States also seeks to minimize the creation of orbital debris by its own government and non-government operations in space, as is mentioned in the President's National Space Policy.

General SHELTON. Yes. Controlling, minimizing, and mitigating space debris is beneficial to all space fairing nations and global users of space products. National Space Policy directs that "The United States shall take a leadership role in international fora to encourage foreign nations and international organizations to adopt policies and practices aimed at debris minimization and shall cooperate in the exchange of information on debris research and the identification of improved debris mitigation practices." Consistent with this policy, the United States should pursue international solutions incorporating allied or U.N. involvement through diplomatic and/or technical solutions.

Admiral MCARTHUR. Yes. Controlling, minimizing, and mitigating space debris are beneficial to all space-faring nations and global users of space products. National Space Policy directs that "The United States shall take a leadership role in international fora to encourage foreign nations and international organizations to adopt policies and practices aimed at debris minimization and shall cooperate in the exchange of information on debris research and the identification of improved debris mitigation practices." Consistent with this policy, the United States should pursue international solutions incorporating allied or U.N. partnerships to influence the global space community in this area through diplomatic and/or technical and scientific channels.

OPERATIONALLY RESPONSIVE SPACE

6. Senator BILL NELSON. Dr. Sega, General Chilton, and General Shelton, I am glad to see that the Air Force has included funding for ORS. The three main elements of ORS are launch, satellite buses, and sensors. How should we think about dividing time, attention, and funding among these three pieces of ORS? Is the fiscal year 2008 budget request balanced appropriately?

Dr. SEGA. Yes, the fiscal year 2008 ORS budget request is an appropriately balanced request. The request includes funding for the launch of tactical satellite (TACSAT) experiments demonstrating new sensor capabilities; the beginning of the development of an operational series of spacecraft; and the purchase of launch vehicles, while providing funds to examine the ground infrastructure necessary to fully use the spacecraft. This budget request is intended to be complemented by research, development, test, and evaluation (RDT&E) resources from organizations such as the Air Force Research Lab (AFRL), the Naval Research Lab (NRL), and the Army's Space and Missile Defense Command (SMDC). Flexible funding arrangements are also critical to dynamically balance resources to meet urgent needs.

General CHILTON. The ORS budget is an appropriately balanced request and is detailed as follows:

[In millions of dollars]

Operational TACSAT Block 1	$21.600
Operational launch vehicle multi-vehicle buy	34.000
Operational capability development and integration	3.500
Ground processing, dissemination, and command and control	3.600
TACSAT–4 launch vehicle and operations	18.215
Perform analysis and assess alternative concepts/requirements and program support	4.300
TACSAT–3 and –4 Launch	1.817

The request includes funding for the launch of TACSAT experiments demonstrating new sensor capabilities, the beginning of the development of an operational series of spacecraft, purchase of launch vehicles, and provides funds for examining the ground infrastructure necessary to fully use the spacecraft. This budget request is supported by the RDT&E requests from the AFRL, NRL, and the Army's Space and Missile Development Center which funds the development of new sensors. Flexible funding arrangements are critical to dynamically balance resources to meet urgent needs.

General SHELTON. ORS is a broader concept than improving the responsiveness of spacelift (to include ranges), satellites, and sensors. ORS will enable improved integration through rapid deployment/employment of new, pre-planned, or existing capabilities. It will link operational, acquisition, industry partners, and science and technology communities to rapidly exploit emergent capabilities to fill operational gaps. ORS will generate warfighting effects for operational and tactical use in response to urgent or unanticipated needs. The focus is on responsiveness. Tasked by a Joint Force Commander (JFC), it will be timely and targeted to the need, while enhancing survivability and adversary deterrence.

The budget is balanced appropriately. There is sufficient funding to standup the ORS office, investigate what the office should initially focus on, and buy some long lead item components to make ORS a reality for the warfighter. Funding concerns exist relative to resources in the out years and support from Congress going forward will be critical to continued success.

7. Senator BILL NELSON. Admiral McArthur, what is the Navy vision for ORS and what is the Navy's role in ORS?

Admiral MCARTHUR. The Navy vision for ORS is to provide a more affordable way to get beyond the line of sight of communication capabilities, rapid-reaction ISR sensors, and other tactically and operationally significant payloads, on orbit, in a tactically relevant timeframe to respond to asymmetric challenges and hedge against uncertainty. Navy supports ORS because maritime forces need the flexibility that ORS offers to augment and reconstitute critical warfighting capabilities in order to counter increasingly agile adversaries.

Navy's role in ORS is to be a partner in a truly joint effort to build on the TACSAT series of experiments and deliver an operational capability to the JFC. We realize that ORS is more than just smaller, rapidly developed satellites and requires an end-to-end examination to develop the agility and capabilities needed to rapidly adapt to the ever evolving threat environment facing our JFCs.

8. Senator BILL NELSON. Admiral McArthur, how should the joint ORS office be structured, funded, and staffed?

Admiral MCARTHUR. Navy actively participated in the congressionally directed 120-day ORS study and supports its findings. This study report titled "Plan for Operationally Responsive Space" was provided to Congress at the end of April and lays out the structure, funding, and staffing plan for the joint ORS office. To obtain the depth and breadth of expertise in both space systems and joint warfighting, with reachback to the entire National Security Space (NSS) community, the office should be staffed with trained personnel from all Services, agencies, and the Intelligence

Community. We need to build on the TACSAT series of experiments to reflect the partnerships that need to be developed among the Services, COCOMs, and Intelligence Community to provide innovative solutions and leverage the best talent available across the NSS community to solve warfighting challenges. The ORS office should be a truly joint office with the military departments and agencies nominating candidates for the director and top leadership positions to the ORS Executive Committee and DOD Executive Agent (EA) for Space for review and selection.

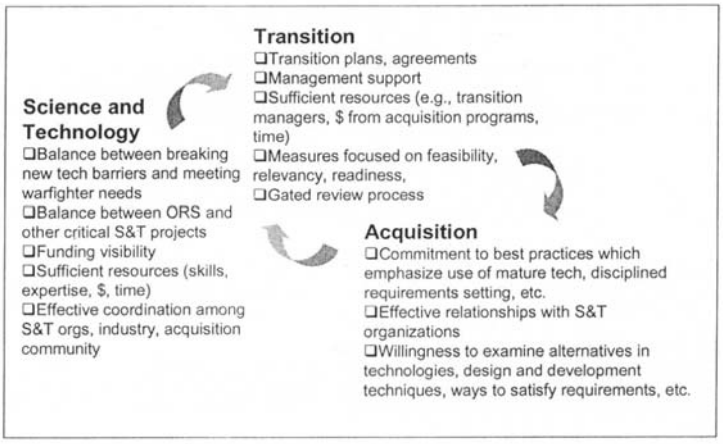
As described in the "Plan for Operationally Responsive Space," responsibility for funding joint ORS capabilities belongs to the DOD EA for Space through the Program Elements listed in the report. As part of the joint TACSAT and ORS effort, Navy, through the Office of Naval Research (ONR), is investing $15 million of S&T funds each year in moderate-to-high-risk projects that result in significant prototypes through the Space Innovative Naval Prototype program. Investments are focused on naval capability gaps that space can fill such as ship tracking, data exfiltration from buoys, communications-on-the-move, submarine detection, cueing, and littoral characterization. NRL led development of a ship tracking payload for TACSAT–1 and a secondary payload on TACSAT–2. ONR is providing a secondary payload for TACSAT–3 that provides a basic IP-based data exfiltration capability. NRL is leading TACSAT–4 for the joint community with ONR funding the UHF Communications payload to support comms-on-the-move and data exfiltration. TACSAT–4 uses a prototype spacecraft bus resulting from a broad government-industry team effort to develop and mature bus standards for increased modularity. The spacecraft should be completed by the first half of next year and will be launched into a highly elliptical orbit to provide long dwells over theater. NRL is managing the ORS Payload Technology initiative for OSD. This initiative jointly evaluated 75 industry proposals and awarded 14 which are being developed by industry now and over the course of the next year.

9. Senator BILL NELSON. Ms. Chaplain, from the Government Accountability Office (GAO) perspective, what are the most important elements in keeping ORS responsive and inexpensive?

Mr. CHAPLAIN. ORS represents a collection of efforts designed to deliver space-based capabilities to warfighters more efficiently and effectively. They encompass development of small-size tactical satellites, cheaper and smaller launch systems, standardized satellite components, as well as efforts that are exploring new design techniques and ways to better protect space-based equipment. There are a variety of ways ORS can help to improve the way satellites are acquired in DOD—for example, by providing opportunities and resources to test out future sensors and software; reducing pressure to satisfy al! war fighting requirements in a single, large program; and developing common approaches to design and production.

At your request, we are initialing a review that will focus on progress DOD is making in implementing these initiatives as well as a strategy on managing and coordinating these efforts. Our past work, however, has already identified elements that need to be in place to make ORS a success. Figure below highlights these.

Figure 1: Elements Needed to Make Operationally Responsive Space a Success



Within the science and technology (S&T) community, for example, there needs to be effective prioritizing of investments between ORS projects and non-ORS projects, so that DOD can ensure that critical technology development efforts, such as the development of advanced batteries, are adequately funded. There also needs to be effective coordination among S&T organizations, industry, and the acquisition community, so that lessons learned from ORS can be effectively integrated into the larger acquisition programs and ultimately engrained in the organizational culture. Our past work has generally found that efforts are not adequately coordinated nor are S&T investments strategically balanced and prioritized.

Likewise, within the acquisition community, there needs to be a sustained commitment to using best practices and a willingness to examine alternatives in technologies, design and development techniques, and different ways to satisfy requirements. Our testimony noted that while current leadership has embraced adopting best practices, there was no guarantee that this commitment could be sustained until DOD changed its policies and processes surrounding space acquisitions.

Finally, our best practice work has identified elements that need to be in place to ensure a smooth transition between projects that have been a success in the S&T community to the acquisition community. They include transition plans and agreements; managers to guide the transition process; measures focused on feasibility, relevance, and readiness; and a gated review processes to ensure that the right progress is being made and enlist product line commitment. Leading commercial companies use these techniques for successfully developing and transitioning technologies, with the basic premise being that technologies must be mature before transitioning to the product line side. At present, however, DOD lacks the breadth and depth of these techniques, and it routinely accepts high levels of technology risk at the start of major weapon acquisition programs. These shortcomings contribute significantly to DOD's poor cost and schedule outcomes.

Our ORS review will assess whether these elements are in place and it will seek additional input from the S&T community and others on what additional tools can enable success. We look forward to reporting on the results of our review early next year.

NATIONAL SECURITY SPACE OFFICE

10. Senator BILL NELSON. General Shelton and Dr. Sega, following the decision to have the director of the National Reconnaissance Office (NRO) be separate from the Under Secretary of the Air Force, the Director of the NRO pulled out support, both money and people, from the National Space Security Office (NSSO). The NSSO was created to be a independent think-tank essential to address, work, and resolve crosscutting issues within all of the space community. In your views, should the NRO continue to support NSSO?

General SHELTON. The NRO should continue to support the NSSO for planning, programming, and defense acquisition processes. This will support DOD-wide efforts to provide information sharing, alignment, and/or integration. This will result in optimizing government resources and leveraging expertise. It is important that the DOD and the Intelligence Community work closely together in order to provide transparency and leverage space activities across NSS. This collaboration will improve situational awareness for both the black and white space communities. The critical element is that there is collaboration, not that it comes solely from the DOD EA for Space's NSS Organization.

Dr. SEGA. The NSSO continues to develop coordinated, synchronized, and integrated capabilities to support the DOD and the Intelligence Community. The NSSO does this through NSS architectures, strategies, and the NSS Plan. NRO support is important and the NRO continues to fund some NSSO led studies.

TACSAT–2

11. Senator BILL NELSON. Dr. Sega, could you provide an update on TACSAT–2, including the various sensors and how they are operating, including the solar panels and the resolution of the NRL sensor and the impact of this issue for future TACSATs?

Dr. SEGA. Consistent with the event-driven check-out/testing process, one experiment, the Miniaturized Vibration Isolation Experiment (MVIS), remains to be activated. The remaining 11 experiments are performing well and the detailed status of each will be provided in a separate briefing to your staff.

The power from TACSAT–2's main solar arrays is sufficient to power all satellite/experiment requirements. Additionally, there are two experimental solar arrays on the satellite. One experimental array has fully deployed and is producing approximately 50 percent of expected output power. The second experimental array has not been able to be fully deployed and is not producing power. Attempts will be made to redeploy this array.

The TACSAT–2 experiment team is working with appropriate government agencies to address intelligence oversight and data handling processes associated with data gathered by the experimental payloads. As lessons are learned from the TACSAT–2 experiment, they will be transitioned to other experimental programs.

12. Senator BILL NELSON. General Chilton, General Shelton, and Admiral McArthur, do you see operational interest in the various sensors on TACSAT–2 or any residual operational capability?

General CHILTON. Two of the experiments aboard TACSAT–2 are receiving operational interest, the Imager and the Target Indicator Experiment which collects radio, radar, and handheld communication signals and will monitor the automated identification signal now required on large ocean-going vessels. The Air Force and NRLs are performing checkout and calibration of both of these sensors. The spacecraft is planned to participate in a series of exercises through the summer to evaluate the potential military utility of these sensors. At the completion of that process, the capabilities of the spacecraft will be well-understood, and if appropriate, made available for operational use.

General SHELTON. TACSAT 2 satellite signals intelligence and imagery payloads are in test and checkout by the NRL and AFRL. A Military Utility Assessment will commence with exercise Talisman Saber (18–30 June 2007). This exercise will confirm the military utility of the two primary sensors and will provide insights for process improvements and more timely distribution of data directly to the requesting warfighter in theater. If our expectations for TACSAT–2 are realized, we will make plans for residual operations.

Admiral MCARTHUR. Absolutely. TACSAT–2 was successfully launched on 16 December 2006 and the Navy has already lost several experimentation opportunities over the last months for the Target Indicator Experiment (TIE), which brings with it an AIS-based ship tracking capability. Another such opportunity could be lost, an experiment that could show cross-mission ELINT geolocation during upcoming exercise Talisman Saber. Additionally, NRL will likely be hard-pressed to complete the ACTD requirements in a timely manner given the fact that this payload will now be competing with the other 12 payloads for limited power, downlink time, and general attention. Assuming that suitable, alternate exercise and experimentation venues can be identified, the current delay associated with TACSAT–2 is also eating into any residual operational capability that may exist. Navy is anxious to experiment with the STRATCOM ORS CONOPS after the ACTD and MUA requirements have been met. Progress is being made to resolve the issues currently hindering ex-

perimentation and testing of the TIE and imagery payloads, and we are hopeful that viable interim solutions will be in place soonest as everyone works toward a long-term solution. The potential operational impact of these experimental payloads cannot be overstated and would be effectively utilized by Navy as we conduct global operations and continue to build regional and global Maritime Domain Awareness (MDA).

STARFIRE OPTICAL RANGE

13. Senator BILL NELSON. Dr. Sega and General Chilton, could you please explain the full purpose of the Starfire Optical Range (SOR) in New Mexico?

Dr. SEGA. SOR is part of the AFRL and is located on Kirtland Air Force Base, NM. For over 20 years, SOR has been the premier DOD site for the development of atmospheric compensation technologies and related advanced optical and beam control technologies. The principal activities of the SOR include improving SSA research and development, and the understanding of laser propagation through various atmospheric conditions.

General CHILTON. The SOR is the U.S. premier research facility on adaptive optics and ground-based imaging research, and developing new ways to detect, track, and identify objects in space. It is an AFRL facility and is not funded by AFSPC. AFSPC works closely with the SOR to help evaluate emerging technologies for potential integration into operational SSA missions. The activities at SOR which interest AFSPC are active tracking, small object detection, low earth orbit object characterization and deep space imaging. The integration of adaptive optics and low power solid state lasers, enables SOR to measure the turbulence in the atmosphere and "adapt" the optics within the telescope to collect very good, high resolution imagery of space objects from the ground. This imagery can be used for anomaly resolution, low earth orbit characterization and small/dim threat detection (such as micro-satellites). Historically, the SOR (and its sister site at Maui) have been limited to operating when the site is in the dark and the objects are lit by the sun. This limited timeframe severely limits the amount of satellite passes the SOR (or Maui) can track or image. Today, the SOR is working to develop new imaging technologies which could pioneer good quality day and night imaging and tracking data, giving the United States its only 24/7 ground-based optical SSA mission. AFSPC hopes to transition these efforts in the near future.

14. Senator BILL NELSON. Dr. Sega and General Chilton, is the SOR laser being developed for possible use as a laser weapon to damage, disable, or destroy satellites?

Dr. SEGA. No, the lasers located at the SOR are low power lasers used for tracking space objects and in developing advanced beam control technology for imaging applications. This equipment does not generate enough energy for weapons class applications. SOR also has an extensive Predictive Avoidance System to ensure it is operated in a safe manner.

General CHILTON. No, the lasers located at SOR are low power lasers used for tracking space objects and correcting for atmospheric turbulence while tracking or imaging. This equipment does not generate enough energy for weapons class applications. Even so, SOR has an extensive Predictive Avoidance System to ensure it is operated in a safe manner. There is no existing weapon system and there are no plans to build one using the SOR equipment.

15. Senator BILL NELSON. Dr. Sega and General Chilton, are the adaptive optics being used to increase the power of the laser?

Dr. SEGA. Adaptive optics are used to remove distortions in the optical path resulting in a more uniform phase front and sharper image.

General CHILTON. The current SOR equipment configuration does not propagate either of the low power tracking or atmospheric compensation lasers through the adaptive optics system. Transmitting a laser through an adaptive optics system would require significant modification to the optics beam train and the facility itself. It is important to add a technical note: adaptive optics would not increase the power of the laser in any case. The adaptive optics system could increase the amount of energy transmitted by correcting for atmospheric turbulence, but the power of the laser is fixed upon installation.

QUESTIONS SUBMITTED BY SENATOR MARK PRYOR

CHINESE ANTI-SATELLITE TEST

16. Senator PRYOR. General Chilton, I found our conversation in my office recently very interesting, specifically the issues surrounding the kinetic ASAT test conducted by China earlier this year. I am extremely concerned about the implications this test has had toward our national security, particularly given the fact that many of our military and weather satellites are operating in the same low earth orbit as the destroyed Chinese weather satellite. What are your concerns and how are we responding to this incident?

General CHILTON. My top priority is providing Maj Gen Shelton, Commander of JFCC–SPACE, with the SSA he requires to effectively operate and protect our space systems. With our Nation's growing dependency on capabilities provided from all orbital regimes, it becomes increasingly important that we identify, characterize, and defeat any threat to our space systems. Equally important, we must attribute who or what caused any interruption or loss of capability. Without adequate SSA, key leaders are denied the information they need to employ the full range of political, economic, or military options to deter or counter space threats.

To address this concern, we are advancing key programs. In fiscal year 2008, we begin development on an ISSA program, replacing our 1990s 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. The RAIDRS Block 20 program will fuse and exploit ISSA data, enabling JFCC–SPACE to better protect critical space assets and respond to emerging threats.

SPACE DEBRIS

17. Senator PRYOR. General Chilton, we also talked about the unique implications of space debris. I understand the significance a piece of debris, even the size of a penny, has on orbiting satellites or even space operations. Is there any international governing body that monitors these debris fields, and what kind of reprisal, if any, may be levied upon a country that irresponsibly contributes to the pollution of space?

General CHILTON. There is no international governing body that monitors debris. Only the United States and the Russian Federation have debris catalogues. The U.S. system is superior to the Russian's. The European Space Agency is considering proposals to develop its own monitoring system and catalogue, but has not done so. Many space-faring countries have individual sensors that are able to detect or track debris, but do not have a continuous or comprehensive system for debris cataloging. The Interagency Debris Coordination Committee (IADC) is an international body with representatives from all the major space-faring countries. The IADC created guidelines that help mitigate the debris problem, but the IADC does not have the mandate or the resources to monitor debris.

There are no enforceable legal mechanisms in place to deter countries from creating large debris fields. The existing legal regime could, under certain circumstances, result in a country being liable for damage it causes in outer space, but only if there was some negligence or fault. The act of creating debris, by itself, is not specifically regulated by existing international law, including treaties, governing activities in outer space. In June 2007, the Committee on the Peaceful Uses of Outer Space (COPUOS), the United Nations' body that makes recommendations to the General Assembly concerning activities in space, will consider a report proposing non-binding debris-mitigating measures. One of the measures suggests avoiding intentional destruction of space objects, and when necessary, conducting those activities only at very low altitudes to limit the lifetime of the debris.

UNITED STATES SPACE COMMAND RETENTION

18. Senator PRYOR. Dr. Sega, I can imagine the United States Space Command requires unique and specifically qualified personnel with the appropriate technical foundations to effectively carry out the mission. What challenges do you have with recruitment and retention?

Dr. SEGA. Attracting and retaining good people is a continuing focus of the NSS community. The Space Professional Oversight Board (SPOB) provides the overall DOD oversight and includes participation of organizations outside of the DOD. Additionally, the National Defense Education Program (NDEP) provides scholarship op-

portunities in math, science, and engineering to support the development of a technical workforce in critical disciplines across the DOD.

The Commander of Air Force Space Command (General Chilton) is the Space Professional Functional Authority (SPFA) for the Air Force, and is responsible for the health of the Air Force Space Professional Community. He has also established a SPFA Advisory Council, which provides recommendations on policy and guidance that directly impact space personnel development. Assignment policies are currently being reviewed with a focus on accurate placement of technically qualified officers in positions that effectively use their skills in challenging jobs throughout their careers. Also, educational opportunities are being expanded through the National Security Space Institute (NSSI) and military/civilian institutions to enhance individual competencies and help Air Force Space Professionals achieve educational and training goals.

FUNDING SPACE OPERATIONS

19. Senator PRYOR. Dr. Sega, could you explain your request for incremental funding for space operations?

Dr. SEGA. The Air Force would like the flexibility to implement an alternative funding approach for its major space systems that require uninterrupted continuity of service. Incrementally funding the procurement for major space programs in areas such as missile warning; strategic communication; and position, navigation, and timing, is one approach to achieving better budget stability across the space portfolio. Another viable solution could be to increase the number of satellites that can be developed using RDT&E funding.

QUESTIONS SUBMITTED BY SENATOR JEFF SESSIONS

OPERATIONALLY RESPONSIVE SPACE

20. Senator SESSIONS. Dr. Sega, with regard to ORS, I wanted to ask you about the role that you envision for the Army. The Army is the most intensive user of space-based capabilities. I am concerned because the Army's definition of "operationally responsive" is likely to be different from that of the Air Force. Without Army engagement early in the process, ORS may produce capabilities that are too slow or otherwise not sufficiently focused on the needs of warfighters on the ground. I want to make sure that the ORS program remains true to the mission of supporting the joint tactical warfighter and not evolve into a strategic gap filler. Does the recently prepared DOD report on ORS include a discussion of the Army's role, specifically the role of the Army SMDC?

Dr. SEGA. Yes, the Army SMDC has been heavily involved in ORS efforts, highlighted in the "Plan for Operationally Responsive Space" submitted to Congress on April 17, 2007, which states, "The TACSAT Demonstration Program, with participation from the AFRL, NRL, the Army's SMDC, and AFSC is the principal test bed for proving out the technologies required to develop and field future ORS space capabilities." The SMDC provides planning, integration, control, and coordination of land forces' exploitation of space capabilities. SMDC will contribute a land component warfighting perspective essential to guiding the choices for ORS and ensuring emerging capabilities are relevant and suitable to ground troops.

The DOD, with participation from all Services and multiple government agencies, has defined ORS as the ability to rapidly develop and field space capabilities that satisfy the needs of the JFC.

On May 21, 2007, a joint ORS Office was stood up at Kirtland Air Force Base, New Mexico, to engage with Services early in the acquisition process and to produce solutions tailored to the warfighters. The plan is for joint participation, from all the Services, organizations involved in space development activities, and users of space capabilities in ORS.

21. Senator SESSIONS. Dr. Sega, what conclusions did the report team reach?

Dr. SEGA. A joint/interagency team prepared the "Plan for Operationally Responsive Space," which was signed out by the Deputy Secretary of Defense to Congress on April 17, 2007. This plan highlighted several points that are important in establishing a common understanding of steps necessary to implement ORS. Some of these highlights are:

> A community-wide effort is essential to develop and execute a comprehensive plan for ORS. This includes defense, intelligence, and civil agency par-

ticipation with perspectives from warfighters, operators, scientists, developers, and acquirers.

The stand-up of the ORS office and the acquisition of ORS capabilities must champion the intent to develop, acquire, field, and employ space capabilities in shortened timeframes in more affordable ways that are directly focused on the end users. Additionally, the ORS office must be more than a program office and should take on the role of integrator of ORS efforts throughout the community.

The scope of ORS is more than rapid launch and small satellites, and should emphasize a tiered approach to improving responsiveness. This approach first employs existing capabilities; second, deploys field-ready capabilities; and third, develops new capabilities.

ORS initiatives must be complementary to existing space systems and capabilities.

22. Senator SESSIONS. Dr. Sega, how are you going to ensure that ORS is a joint program?

Dr. SEGA. Leadership and oversight are critical to ensuring ORS is a joint program. We are developing the ORS office, which stood up at Kirtland Air Force Base on May 21, 2007, as a joint organization and we will also have a structure, the ORS Executive Committee (EXCOM), to provide continuing joint/interagency advice on how to best execute our ORS program. "The Plan for Operationally Responsive Space" (submitted to Congress on April 17, 2007) states that within the ORS office "the positions will be staffed with trained personnel from all Services, agencies, and the Intelligence Community and the Reserve components."

23. Senator SESSIONS. Dr. Sega, specifically, how are you going to ensure balanced leadership and participation across the Services?

Dr. SEGA. We developed "The Plan for Operationally Responsive Space" (submitted to Congress on April 17, 2007) as a joint undertaking, with participation across the Services and several other organizations—inclusive of all interested stakeholders throughout the defense, intelligence, and civil space communities.

The joint ORS office will be manned by representatives from across the Services and agencies. The success of the ORS concept is critically dependent on Army, Navy, Air Force, and Marine Corps involvement, as well as a balanced mix of expertise across the operations, science and technology, and acquisition communities.

We are also implementing an ORS EXCOM, made up of senior leaders from across the NSS community, to include the Services and other government agencies, to provide "strategic guidance and the senior-level commitment required for success" (reference "The Plan for Operationally Responsive Space"). The EXCOM will be led by the Commander, United States STRATCOM) and the DOD EA for Space and will provide recommended ORS priorities for joint ORS efforts.

24. Senator SESSIONS. Dr. Sega, the Army has requested that an Army officer be named as Deputy Director of the newly-established ORS Program Office. Do you expect that this request will be accepted?

Dr. SEGA. The ORS office was activated on May 21, 2007 and is currently in the process of staffing the organization's initial cadre. Once staffed, there will be a minimum of one Deputy Director within the office. As the ORS effort matures, there may be multiple Deputy Directors selected for the ORS office to achieve objectives, to balance the office's community representation, and to capture the breadth of expertise across the NSS community.

We encourage each of the Services to nominate qualified candidates for the Deputy Director positions. These positions, along with all the military and civilian positions in the ORS office, are being defined this summer and detailed position descriptions are being written. In fact, the Army is actively participating in the effort to define the full-up ORS office staffing requirements, and will remain an important partner in improving the responsiveness of space capabilities to address the needs of our troops on the ground.

25. Senator SESSIONS. Dr. Sega, who will ultimately decide how ORS roles, missions, and budgets are divided among the Services?

Dr. SEGA. From "The Plan for Operationally Responsive Space" (submitted to Congress on April 17, 2007):

> The ORS EXCOM will provide senior-level recommendation for the ORS Director concerning personnel and resources from across the NSS agencies, while providing strategic guidance and the senior level commitment required for success.

The DOD EA for Space will provide direct oversight of the ORS Office and serve as the Service Acquisition Executive for the Office's efforts. The DOD EA for Space will also convene the ORS EXCOM in coordination with the Commander of the U.S. STRATCOM (CDRUSSTRATCOM).

The CDRUSSTRATCOM will provide operational oversight for all ORS activities consistent with the UCP and other applicable authorities.

The responsibility of the ORS Director will be to serve as the head of the Office and provide authority, direction, and control over the personnel and resources in the ORS office. The ORS Director will report to the DOD EA for Space.

26. Senator SESSIONS. Dr. Sega, how will the ORS program office ensure that joint resources are made available for the other Services to develop concepts, technologies, sensors, and platforms?

Dr. SEGA. We intend that the requested ORS program budget, which will be augmented by funding from each of the Services and several other government agencies, will be used to fund the development, demonstration, acquisition, and deployment of ORS capabilities. We intend to use the entire NSS community to help develop concepts and solutions and then to execute this work using highly-qualified organizations. Additionally, an EXCOM, consisting of representatives from the Services and agencies involved in ORS, will provide senior-level recommendations concerning how best to apportion resources to support identified priorities.

[Whereupon, at 4:06 p.m., the subcommittee adjourned.]

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2008

WEDNESDAY, MAY 2, 2007

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

DEPARTMENT OF ENERGY ATOMIC ENERGY DEFENSE PROGRAMS

The subcommittee met, pursuant to notice, at 2:39 p.m. in room SR–232A, Russell Senate Office Building, Senator Bill Nelson (chairman of the subcommittee) presiding.

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

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

Minority staff members present: Michael V. Kostiw, Republican staff director; and Kristine L. Svinicki, professional staff member.

Staff assistants present: Kevin A. Cronin and Jessica L. Kingston.

Committee members' assistants present: Christopher Caple, assistant to Senator Bill Nelson; Todd Stiefler, assistant to Senator Sessions; and Jason Van Beek, assistant to Senator Thune.

OPENING STATEMENT OF SENATOR BILL NELSON, CHAIRMAN

Senator BILL NELSON. Good afternoon. We originally had this hearing scheduled in April, but we had to move it because of the Senate schedule at the time. Secretary Bodman was to be one of the witnesses, but he cannot be here today. He has graciously agreed to respond to any questions for the record that we want to submit.

Welcome to James Rispoli, Assistant Secretary of Energy for Environmental Management, and Glenn Podonsky, the Chief Health, Safety, and Security Officer. Each of you has a prepared statement and it will be part of the official record. We are going to have a conversation here, so we do not want you reading testimony to us.

Mr. Secretary, we look forward to hearing from you about the waste treatment plant project in Hanford, Washington, as well as the overall status of the Department's efforts to clean up and safely dispose of radioactive and other hazardous wastes.

Mr. Podonsky, you head the newly created office with oversight responsibilities covering safety, security, and health, and we want to discuss some of the security issues today.

[The prepared statement of Senator Bill Nelson follows:]

PREPARED STATEMENT BY SENATOR BILL NELSON

Good afternoon. This hearing was originally scheduled for April 27, but because of the Senate schedule we had to move the hearing to today. Secretary Bodman was to be one of the witnesses, but unfortunately his schedule was unable to accommodate the new date. His prepared statement will be included in the record. Secretary Bodman has also graciously agreed to respond to any questions for the record that members might have.

It is a pleasure to welcome James Rispoli, Assistant Secretary of Energy for Environmental Management, and Glenn Podonsky, the Chief Health, Safety, and Security Officer today.

I note that each of you, has a prepared opening statement, and without objection, they will also be included in the hearing record.

Secretary Rispoli, we look forward to hearing from you about the Waste Treatment Plant project at the DOE site in Hanford Washington, as well as the overall status of the Department's efforts to clean up and safely dispose of the radioactive and other hazardous wastes from the Cold War.

Mr. Podonsky, you head a newly created office with significant oversight responsibilities, covering safety, security and health. Among other issues we would like to specifically discuss some of those security issues today.

Senator BILL NELSON. Senator Sessions.

STATEMENT OF SENATOR JEFF SESSIONS

Senator SESSIONS. Thank you, Mr. Chairman. This is an important hearing for a lot of reasons. One is the cost that we will be spending through the Department of Energy (DOE) for defense programs.

I welcome our witnesses today and thank you for your service. I would just note that in the Department's most recent financial statements as of September 30, 2006, life cycle cost of the environmental management (EM) program was reported as $173 billion over 30 years of work. I cannot express how frustrating it is to read this statement contained in Secretary Bodman's written testimony for this hearing.

He said: "The environmental management program has experienced setbacks. At the core of these setbacks are optimistic planning assumptions that have not materialized, combined with new scope and requirements that were not anticipated. As a result, EM estimates the life cycle cost of the program could increase by $50 billion."

This is a staggering cost increase. If any other defense program under the jurisdiction of this committee reported a cost increase of this magnitude, Senator Nelson would melt down, I suspect. In the world of nuclear environmental issues, however, we do not seem to be able to confront these issues effectively.

Let us think about what even $10 billion in defense funding could buy. $10 billion is more than the entire annual budget of the Missile Defense Agency. With $10 billion the United States Navy could buy 40 Littoral Combat Ships, and 45 next generation refueling tankers.

So I do not mean this totally in this fashion, but to blithely spring on Congress a $50 billion increase for a cleanup program is

shocking to me. I believe we need to evaluate this fundamentally. I believe it is a policy debate also, not just a technical debate.

The reality is that most of these sites will be locked away and inaccessible on Federal reservations for the foreseeable future. We have to deal with it. We have to have a cleanup program, and certainly rivers and bodies of water cannot be polluted. But I think we need to ask ourselves real carefully how we can manage such a huge financial cost.

I will be asking some questions as we go forward about how the Department and the Secretary can challenge these numbers and rethink maybe what we are doing and see if we cannot bring down these costs substantially.

There are a lot of other important issues, but that was one that was in my craw a bit. Thank you, Mr. Chairman.

[The prepared statement of Senator Sessions follows:]

PREPARED STATEMENT BY SENATOR JEFF SESSIONS

I would like to join Senator Nelson in welcoming our witnesses this morning. I appreciate the accommodation you both have made in rescheduling this hearing from last week. Although Secretary Bodman is not able to be here at this time, I understand that his testimony will be accepted for the record and members will be able to submit questions to him in writing.

Today, the subcommittee will hear from two witnesses regarding significant elements of the Department of Energy (DOE). From Assistant Secretary James Rispoli, we will hear about the cleanup of DOE sites across the Nation through the Department's Environmental Management program. Mr. Podonsky will address the cross-culling issues and challenges he oversees as the Chief Health, Safety, and Security Officer of the Department.

Assistant Secretary Rispoli, I appreciated the discussion we began in your appearance before the subcommittee last year, where we explored the cost and regulatory pressures within which you must address the environmental contamination and eventual cleanup of DOE sites. This is a tough challenge, from many different aspects, and the cost control on these projects has not been what many of us would desire. I am deeply concerned about the statement contained in Secretary Bodman's written testimony that the life cycle cost of the Environmental Management program may increase by approximately $50 billion due to "optimistic planning assumptions that have not materialized combined with new scope and requirements that were not anticipated." This is a staggering cost increase. Let's think about what even $10 billion in defense funding could buy. Ten billion dollars is more than the entire annual budget of the Missile Defense Agency. With $10 billion, the U.S. Navy could buy 40 Littoral Combat Ships, 45 next-generation refueling tankers, or even 2 *Nimitz*-class aircraft carriers.

I will continue to explore my concerns about the cost of this program, both in our hearing today, and as we proceed with the National Defense Authorization Bill. I hope your testimony will provide further information about this matter.

Mr. Podonsky, you are the head of a newly formed organization within the Department, or perhaps more accurately, a new office which pulls together many existing health, safety and security functions within the Department. As I understand it, the objective in standing up this new office was to provide the Secretary of Energy with a more coherent view of the performance of his Department from the standpoint of safety, security, and worker health. I look forward to hearing your perspectives on whether this new organization is meeting the goals set out for it.

When Secretary Bodman appeared before the full Armed Services Committee last year to testify on the DOE budget, I outlined a pretty hard-hitting assessment of the manner in which the Department was carrying out the programs assigned to it, and the improvement I thought was needed. After reflecting on my assessment, Secretary Bodman replied that he would agree with many of my criticisms—that the Department can and must do better. I appreciate that the Department has been working to improve its management and execution of projects by, for example, increasing the training and capability of project managers and contracting officers working at DOE. In my view, however, substantial challenges remain.

I am still concerned about the cost and expectations for the DOE environmental cleanup program. In Washington State, the Environmental Protection Agency re-

cently fined the Department of Energy over $1 million in a regulatory dispute over the cleanup at Hanford. We have one part of the Federal Government fining another, and at the end of the day, it is all the same taxpayer money. We need to keep in mind what exactly the objectives for this cleanup really arc.

Although Secretary Bodman could not be here today, his written testimony addresses the Reliable Replacement Warhead program. I believe that Congress should approve the next evaluation phase of the program, but I believe that DOE should examine the cost of this program very closely. In my view, this program should not be a vehicle for recreating a laboratory complex sized for Cold War missions. The Federal Government has a long history of pursuing weapons development programs that—we are told—are going to "save money" and then the savings get lost somewhere along the way.

Let me again join our chairman in thanking our witnesses for their service and for appearing here today. I look forward to their testimony on these important matters.

[The prepared statement of Secretary Bodman follows:]

PREPARED STATEMENT BY HON. SAMUEL W. BODMAN

Chairman Nelson, Ranking Member Sessions, and members of the subcommittee, I am pleased to be with you this afternoon to present the President's fiscal year 2008 budget proposal for the Department of Energy (DOE).

With programs such as the Reliable Replacement Warhead (RRW), Mixed Oxide Fuel Fabrication Facility (MFFF), Hanford Waste Treatment Plant and other defense related activities, the fiscal year 2008 budget seeks to meet the DOE's responsibilities in national security and environmental cleanup. Before I discuss these further I would like to take a moment to briefly mention the President's energy initiatives announced during the State of the Union. President Bush has called on this country to reduce gasoline usage by 20 percent in the next 10 years. We have named this our "Twenty in Ten" plan and I urge you to support this ambitious proposal. America's oil dependence leaves us more vulnerable to hostile regimes as well as terrorists who target oil shipments to harm our economy.

America will reach the President's "Twenty in Ten" goal by requiring the use of 35 billion gallons of renewable and alternative fuels by 2017, while also reforming the Corporate Average Fuel Economy standards for cars and extending the current light truck rule. In 2017, the combined savings of these measures are projected to reduce annual gasoline use by 20 percent.

The President's plan eases threats posed to energy security by encouraging alternative fuels and environmentally sensitive domestic oil production, while also insuring against disruptions by doubling the current capacity of the Strategic Petroleum Reserve to 1.5 billion barrels by 2027.

Coupled with the Advanced Energy Initiative and the American Competitiveness Initiative, which were launched a year ago, these proposals offer a strong plan to enhance America's future security, and I encourage members of the committee to join us in pursuing these proposals.

HIGHLIGHTS OF THE FISCAL YEAR 2008 DEPARTMENT OF ENERGY BUDGET

The President's fiscal year 2008 budget reflects the Department's commitment to protect the United States as stewards of our Nation's nuclear weapons stockpile and to environmental cleanup. To highlight, the fiscal year 2008 budget for the DOE emphasizes investments that will:

- Transform Our Nuclear Weapons Complex. The fiscal year 2008 budget reconfirms the DOE's steadfast commitment to the national security interests of the United States through stewardship of a reliable and responsive nuclear weapons stockpile and by advancing the goals of global nonproliferation. Through the National Nuclear Security Administration (NNSA), the Department directs $6.5 billion in this request for Weapons Activities, a $103 million increase from the fiscal year 2007 request, to meet the existing requirements for stewardship of the Nation's nuclear weapon stockpile, technologies and facilities, as well as to continue to revitalize the nuclear weapons complex with the goal of a much smaller size by 2030. To do so, we developed a transformation concept and vision, the cornerstones of which are "Complex 2030" and the RRW. We are moving forward to implement this strategy now, bringing us closer to achieving an even smaller stockpile that is not only safer and more secure, but one that also reduces likelihood of United States underground nuclear testing. Ultimately, this approach enables a much more responsive nuclear weapons infrastructure.

• Reduce the Risk of Weapons of Mass Destruction (WMD) Worldwide. The fiscal year 2008 budget provides $1.7 billion for Defense Nuclear Nonproliferation, for a comprehensive set of programs to meet our commitment to detect, prevent, and reverse the proliferation of WMD in close cooperation with our partners around the world. This program is an administration priority and while the funding amount shows a 3 percent decrease, this reflects accelerated completions in fiscal year 2007. Further, the request provides significant out-year growth to fulfill our international agreements and accelerate our work to reduce the risk of WMD threats. Among many advances, the fiscal year 2008 budget for example will further our work in the Megaports program by initiating the installation of radiation detection equipment at the Port of Hong Kong.

Because keeping terrorists from acquiring materials will be easier if we limit enrichment of uranium or reprocessing of spent fuel, the President proposed in 2004 a new initiative, the Global Nuclear Energy Partnership (GNEP), which would provide nations which refrain from developing or deploying enrichment and reprocessing technology assured access to the benefits of nuclear power.

• Meet Our Commitments to Public Health and Safety and the Environment. During my first days at the DOE, I announced safety as my top priority and the number one operating principle of the Department. To implement this vision, we created a new Office of Health, Safety, and Security. As I said at the time, "As Secretary of Energy, ensuring the safety of workers across the DOE complex is my top priority and this new office will go a long way in strengthening our safety and security organization. We must be world class not only in how we carry out our mission, but in the safe, secure, and environmentally responsible way in which we manage operations at our facilities across the country." The organization's fiscal year 2008 budget request of $428 million, builds on a number of actions the Department has taken over the past 2 years to increase safety of DOE workers.

The fiscal year 2008 budget includes $5.4 billion for defense-related Environmental Management (EM) programs to protect public health and safety by cleaning up hazardous, radioactive legacy waste left over from the Manhattan Project and the Cold War. Past investments have resulted in the completed clean up of 81 sites through the end of fiscal year 2006, including Rocky Flats, Colorado, and a total of 86 sites by the end of fiscal year 2007, including the Fernald site in Ohio, which was completed in January 2007. This budget allows the program to continue to make progress towards cleaning up and closing sites and focuses on activities with the greatest risk reduction.

As the Department continues to make progress in completing clean up, the fiscal year 2008 budget request of $159 million for Legacy Management (LM) supports the Department's long-term stewardship responsibilities and payment of pensions and benefits for our former contractor workers after site closure.

In light of the increased number of sophisticated cyber attacks directed at all facets of our communities, from military to civilian to private users, the Department is taking significant steps to secure the virtual pathways and mitigate the threat from cyber intrusions. Implementing these steps will be seamless and will not interrupt the availability of information systems resources while preserving the confidentiality and integrity of the information and their contents. A budget request of $170 million in fiscal year 2008 supports the Department's efforts to defend against emerging, complex cyber attacks. Through these efforts, the Department will be in a better position to effectively manage and monitor cyber risk across the complex. In fiscal year 2008, DOE will increase support on a Department-wide basis to deploy new cybersecurity tools and cybersecurity management activities to detect, analyze, and reduce the threat across the complex.

ENSURING AMERICA'S NUCLEAR SECURITY

The President, in his first days in office, was faced with the new and challenging realities of national security in the 21st century. The war on terror has substantially and fundamentally reshaped the national security programs and activities in the Department. This budget of $24.3 billion for the Department is an important component of the President's strategy to address some of these very important issues facing our Nation. Within the $24.3 billion request in fiscal year 2008, $9.4

billion or 39 percent is proposed to support DOE's contribution to the Federal Government-wide effort to ensure the security of our Nation.

The NNSA continues significant efforts to meet administration and secretarial priorities leveraging science to promote national security. The fiscal year 2008 budget proposes $9.4 billion to meet defense and homeland security-related objectives. The budget request maintains current commitments to the nuclear deterrence policies of the administration's Nuclear Posture Review (NPR). To implement those policies for the long-term, NNSA has established a new planning scenario, "Complex 2030", to guide the transformation of the complex. The fiscal year 2008 budget also continues to fund a high profile strategy to mitigate throughout the world the threat of weapons of mass destruction, and provides for the nuclear propulsion needs of the U.S. Navy. Key investments include:

- Transforming the nuclear weapons stockpile and infrastructure while meeting Department of Defense (DOD) requirements, through the RRW and other Complex 2030 initiatives;
- Conducting innovative programs in the Nations of the former Soviet Union and other countries to address nonproliferation priorities;
- Supporting naval nuclear propulsion requirements of the U.S. Navy;
- Maintaining comprehensive security for facilities, employees and information implementing and sustaining upgrades throughout the complex;
- Providing nuclear emergency response assets in support of homeland security;
- Reducing the deferred maintenance backlog and achieving facility footprint reduction goals; and,
- Providing corporate management and oversight for NNSA programs and operations.

The United States continues a fundamental shift in national security strategy to address the realities of the 21st century. The administration's NPR addressed a national security environment in which threats may evolve more quickly and be less predictable and more variable than in the past. The NPR recognizes the need to transition from a threat-based nuclear deterrent with large numbers of deployed and reserve weapons, to a deterrent consisting of a smaller nuclear weapons stockpile with greater reliance on the capability and responsiveness of the DOD and NNSA infrastructure to respond to threats. The NNSA infrastructure must be able to meet new requirements in a timely and agile manner while also becoming more sustainable and affordable. The DOE has created a plan for a revitalized nuclear weapons complex called "Complex 2030". This significantly more agile and responsive complex will allow further reductions in the nuclear stockpile by providing an industrial hedge against geopolitical or technical problems and will reduce security costs by consolidating nuclear materials. The fiscal year 2008 President's budget contains some of the resources required for transformation of the complex in ongoing base program activities that are already underway and contributing to Complex 2030 objectives. The administration is still studying plans and funding projections for other parts of the effort.

The fiscal year 2008 budget request of $6.5 billion for Weapons Activities includes all programs to meet the immediate needs of the stockpile, stockpile surveillance, annual assessment, and life extension programs. On November 30, 2006, the Nuclear Weapons Council determined that the RRW program was feasible as a means for sustaining the long-term safety and reliability of the Nation's nuclear deterrent force. This shift in strategy from a Life Extension Program to a RRW program will require substantial planning and resource realignments by the DOD and DOE. The campaigns are focused on long-term vitality in science and engineering and on research and development (R&D) supporting current and future stockpile stewardship and DOD requirements. A number of these NNSA programs and facilities also support scientific research users from other elements of the Department, Federal Government, and the academic and industrial communities. Within the Nuclear Weapon Incident Response programs, a new National Technical Nuclear Forensics R&D and operations program is established, as well as a stabilization program through leveraged render safe R&D development of first generation equipment in support of homeland security. NNSA's Safeguards and Security activities are also encompassed within the request for Weapons Activities. The Defense Nuclear Security program supports the physical security needs at NNSA sites. These activities increase by 17 percent to sustain base program increases associated with the fiscal year 2003 design basis threat (DBT) upgrades, and a revised schedule for 2005 DBT implementation at NNSA sites. Cybersecurity activities, protecting information and information technology infrastructure, increase by over 15 percent. This will provide for the first

step in a major 5-year effort focused on revitalization, certification, accreditation, and training across the NNSA complex.

Preventing weapons of mass destruction from falling into the hands of terrorists and rogue states is one of this administration's top national security priorities. The fiscal year 2008 request of $1.67 billion for nuclear nonproliferation activities strongly supports the international programs that are denying terrorists and rogue states the nuclear materials, technology and expertise needed to develop or otherwise acquire nuclear weapons. NNSA continues unprecedented efforts to protect the U.S. and our allies from threats, including $265 million for cutting-edge nonproliferation R&D for improved technologies to detect and monitor nuclear proliferation and nuclear explosions worldwide. There are additional major efforts focused on potential threats abroad. For example, in the area of nuclear material protection and cooperation the program has completed security upgrades for Russian navy nuclear fuel and weapons storage at the end of fiscal year 2006 and will complete security upgrades for Rosatom facilities by the end of fiscal year 2008. Also by the end of fiscal year 2008, the program will complete security upgrades at the nuclear warhead sites of the Russian Strategic Rocket Forces and the 12th Main Directorate. To help complete the shutdown of three Russian nuclear reactors still producing 1.2 metric tons of plutonium per year and to replace them with conventional fossil fuel power plants, this budget request includes $182 million for the Elimination of Weapons Grade Plutonium Production program.

Moreover, the RRW approach reinforces our nonproliferation commitments and objectives. Designed with more favorable performance margins that are less sensitive to incremental aging effects, these warheads would reduce the necessity of nuclear tests for the United States to diagnose or remedy a stockpile reliability problem. This will bolster efforts to dissuade other countries from testing. Furthermore, once a transformed production complex demonstrates that it can produce replacement warheads on a timescale to meet emerging geopolitical threats, or timely respond to technical problems in the stockpile, then we can eliminate many spare warheads and further reduce the nuclear stockpile. The RRW strategy will allow us to increase our warhead dismantlement rate, sending a strong message to the world that we are taking meaningful steps towards further stockpile reductions. Additionally, increased confidence in the U.S. nuclear deterrent will assure allies and obviate their need to bolster nuclear forces. Finally, the improved security features of RRW will prevent unauthorized use should a warhead ever fall into the hands of terrorists.

The budget request includes $609 million to support Fissile Material Disposition activities. Of this amount, $334 million is requested for the U.S. Mixed Oxide Fuel Fabrication Plant project at DOE's Savannah River Site in South Carolina. This facility will dispose of 34 metric tons of U.S. surplus plutonium and facilitate complex-wide consolidation of nuclear material. On April 11, the Deputy Secretary approved CD–2, the performance baseline, and CD–3, the start of construction, August 1, 2007, for the MFFF project at Savannah River Site. As per the restriction in the revised fiscal year 2007 Continuing Resolution (Public Law 20–110–5), no construction activities will be initiated prior to August 1, 2007, under the authorized limited preconstruction activities.

Various programs funded by NNSA's Defense Nuclear Nonproliferation appropriation support the President's Bratislava Nuclear Security Cooperation initiative (about $293 million) including security upgrades at Russian nuclear warhead sites, and also support the Global Partnership against the Spread of WMD ($537 million) to meet the U.S. commitment to the G8 nations. In coordination with the Office of Nuclear Energy, the budget request also includes $10 million to support the GNEP, which is focused on advanced safeguards technology development that is crucial to the ultimate success of the GNEP initiative.

NNSA continues to support the United States Navy's nuclear propulsion systems. The fiscal year 2008 request of $808.2 million is an increase of 1.6 percent over the fiscal year 2007 request level. The funding increase assists the Naval Reactors program to ensure the safe and reliable operation of reactor plants in nuclear-powered submarines and aircraft carriers and fulfills the Navy's requirements for new nuclear propulsion plants that meet current and future national defense requirements.

PROTECTING THE ENVIRONMENT BY PROVIDING A RESPONSIBLE RESOLUTION TO THE ENVIRONMENTAL LEGACY OF NUCLEAR WEAPONS PRODUCTION

The Federal Government must address the legacy of our past and our responsibility to the American taxpayers to provide a clean, safe, and healthy environment to live in. A total of $6.34 billion is dedicated in fiscal year 2008 to support the three key pillars that set the framework for the Department to reach that goal. The first

pillar is to continue our environmental cleanup ($5.4 billion) of contaminated Cold War sites across the country. The second pillar is to continue to provide site post-closure management and to carry out our responsibilities ($194 million) to our former contractor workers. The third pillar completes the framework by working to construct a permanent nuclear waste repository at Yucca Mountain ($494.5 million) to address long-term nuclear waste disposal and for authorization of which the Department will submit a License Application to the Nuclear Regulatory Commission not later than June 30, 2008. It goes without saying that my core principle of safe operations throughout the Department will be applied with vigor within this framework.

To deliver on the Department's cleanup obligations stemming from 50 years of nuclear research and weapons production during the Cold War, the EM program continues to focus its resources on the highest health, safety, and environmental risks, such as treatment of over 90 million gallons of radioactive liquid waste stored in decades old tanks; disposition of thousands of metric tons of special nuclear material (surplus weapons-grade uranium and plutonium), spent nuclear fuel, and solid waste stored in older facilities that do not meet today's environmental requirements; and remediation of contaminated soil and groundwater. Up through fiscal year 2007, DOE will have completed cleanup of 86 of 108 legacy nuclear waste sites, with another three site cleanup completions—the Pantex Plant in Texas; Lawrence Livermore National Laboratory—Site 300 in California, and the Inhalation Toxicology Lab in New Mexico—planned for completion in fiscal year 2008.

In fiscal year 2008, the budget includes $5.4 billion to continue cleanup, giving priority to those activities that offer the greatest risk reduction while staying focused on completing cleanup and closing sites. This is a reduction from the fiscal year 2007 request of $173 million, which in part reflects completion of some sites, but also reflects hard choices that must be made. Safety remains the utmost priority. EM is committed to applying my safety principles and will continue to maintain and demand the highest safety performance to protect the workers and the communities where EM operates.

In keeping with the principles of reducing risks and environmental liabilities, the fiscal year 2008 request of $5.4 billion will support the following priority activities:

- Stabilizing radioactive tank waste in preparation for treatment (about 37 percent of the fiscal year 2008 request);
- Storing and safeguarding nuclear materials and spent nuclear fuel (about 19 percent of the fiscal year 2008 request);
- Dispositioning transuranic, low-level and other solid wastes (about 16 percent of the fiscal year 2008 request);
- Remediating major areas of our sites and decontamination and decommissioning excess facilities (about 19 percent of the fiscal year 2008 request).

One of the significant cleanup challenges the EM program faces is the construction of the Hanford Waste Treatment and Immobilization Plant (WTP), which will treat highly radioactive tank waste at Hanford. WTP has encountered significant technical and project management problems, which have caused the project to slow down while the problems were addressed. With the help of senior professionals from private industry, academia and other Government agencies, EM has undertaken an intensive review scrutinizing key elements of the project, including the technology, cost and schedule, project management, project controls, and earthquake seismic criteria. In December 2006, the Department approved a revised, validated baseline of $12.3 billion for WTP. The Department believes WTP is now back on a sound technical and project management footing, and is ready to move forward.

Despite numerous accomplishments and successfully accomplishing site completions, the EM program has experienced setbacks in achieving its vision of accelerated cleanup. At the core of these setbacks are optimistic planning assumptions that have not materialized, combined with new scope and requirements that were not anticipated. As a result, EM estimates the lifecycle cost of the program could increase by $50 billion. EM continues to take steps to address challenges and improve the effectiveness and efficiency of its operation. The Department remains committed to completing this important and necessary mission.

After the EM program completes cleanup of closure sites, with no further DOE mission, post closure stewardship activities are transferred to the Office of LM. Post closure stewardship includes long-term surveillance and maintenance activities such as groundwater monitoring, disposal cell maintenance, records management, and management of natural resources at sites where active remediation has been completed. At some sites the program includes management and administration of pension and benefit continuity for contractor retirees. In fiscal year 2008, $194.2 million

is requested to carry out legacy management functions at both civilian and defense-related sites. The majority of the funding is for long-term stewardship activities and pension and post-retirement benefits for former contractor employees at the Rocky Flats, Colorado, and the Fernald, Ohio, closure sites.

CONCLUSION

I appreciate the opportunity to appear before you to present the fiscal year 2008 budget proposal for the DOE. I will be happy to take any questions that members of the subcommittee may have.

Senator BILL NELSON. Mr. Secretary?

STATEMENT OF HON. JAMES A. RISPOLI, ASSISTANT SECRETARY OF ENERGY FOR ENVIRONMENTAL MANAGEMENT

Mr. RISPOLI. Thank you, Mr. Chairman. I interpreted that you would prefer we not read our oral statements and that is fine. So I thank you, Mr. Chairman and Senator Sessions, for having us here today to go over our program.

Let me just start by addressing the overall program, if I may, and both your point on the waste treatment plant and Senator Sessions' point on the overall cleanup status.

If I may, I can start by assuring you that it is not business as usual and it is not business as before. We, too, are very concerned with the cost of the program. We are doing some things that have never been done before. For example, we are independently auditing with both the technical and financial people the cost of all the projects that make up our program. Never been done before, 56 percent of our program has passed that independent audit.

This helps us to ensure that the assumptions and the costs that we use are reasonable, and I can——

Senator SESSIONS. 56 percent passed?

Mr. RISPOLI. Yes, sir, have been passed. Now, more than 56 percent have been looked at, but we are still working to answer questions and issues on others, because part of our problem has been in the past that we have made unreasonable assumptions, and if those assumptions do not come true the costs go up, or in other cases the estimates are too high and we have to adjust them to the right amount. So this is one element that has never been done before, taking the entire EM program and subjecting it to an independent audit by outsiders that have no play in the game. They are not the normal stable of contractors. These are totally independent groups that go in and look at our projects.

On the management side, once we believe we have a handle on the costs—and again, that is a major effort, to do that—we have instituted a much more rigorous management focus using project management techniques that are standard in the country. This has not been done before. The types of elements that are in this are monthly reporting with oversight by a separate office not in my organization. A separate office looks at monthly reports and reports to my boss, the deputy secretary, on whether they think we are managing our projects well or not.

I get those reports, too. I do a quarterly face-to-face review with all of our people in the field. They either come to the headquarters for the most part or we tie them in by video teleconference, and we review each one of our projects. It is an extensive effort once a quarter. It takes the better part of 2 weeks with huge blocks of

time to review these, to make it clear to our people in the field that we have a tight rein on the way we execute these projects.

Related to that, we are currently in the midst of doing a competency assessment of our own people in the field, because our own people, although we have worked at getting them certified as project managers, they still are missing some of the competencies that we believe they need. We are in the midst of assessing that so that we can provide that type of on-site assistance to them, for example cost control or schedule control. If they do not have those things we want to provide that.

So this is not an inspector general (IG) type of a review. This is a review to provide better staffing for the feds at the site to provide better, more robust oversight of the contractors.

So the first element is the independent audits. The second is the more intense project management focus. The third is, as you might be aware, we have created a new organization for acquisitions in the Department at headquarters so that we can do a better job of writing these contracts with better incentives for the contractors to come in under budget or below cost.

So it is not business as before. All of these are major focus areas for us. They are all with the purpose of getting better cost estimates to start with and then have more credible management as we go forward.

That is for the overall program. If you like, I can address the waste treatment plant as well, which is our largest single project. As you know, its estimate as validated by the Army Corps of Engineers independent review is $12.2 billion. That $12.2 billion clearly makes it the Department's largest capital project. It is an extensive plant that is designed to empty and treat liquid tank wastes in 177 tanks at the Hanford Reservation.

It costs us over $200 million a year just to manage those tanks and keep them safe. So it is not a good long-term answer, because the worry always is, of course, that the tanks may leak over time and put this radioactive liquid waste into the ground. But also, in order to once and for all end the problem, the plan is that we would process all of that waste through this plant that is under construction. It is about 30 percent complete at this time.

The plant will basically take the high-level fraction and vitrify it into glass logs that would go to Yucca Mountain, and the low activity waste fraction would also go into glass logs, for on-site disposal. So there is an element here that would remain on the site, which will save the taxpayers a great amount of money. But the amount of radioactivity left on the site would be minimized by separating the waste into the high-level waste fraction and the low activity waste fraction.

As I mentioned, that plant is now 30 percent done. It has been reviewed by the Army Corps of Engineers. We are still working through a number of technical issues, but we have had an independent team of what we call the best and brightest experts review the technical aspects of the plant. They have told us in writing that they believe the plant will work.

We are still working through some of the issues they identify, but none of them are considered to be show-stoppers. I would say that at this point in time we are a world away from where we were

last year when we were in the same cycle for the budget; I mentioned only two, but when these reviews had not yet been done.

There have been many more reviews of that plant, but I will tell you that we have a high degree of confidence that we can build this plant for the price tag attached to it. I will also tell you that $12.2 billion has a very large amount of contingency in it because the project is so long.

So the idea would be that there is enough room in there to bring it in for less than $12.2 billion, because about $3 billion of that is contingency. The idea being, again, that we want to be sure that we have enough room to solve the remaining issues, or even unknown issues should they arise, and deliver this plant as committed to in our budget to Congress.

So that is an overview of the waste treatment plant. I would be happy to answer any more detailed questions you might have on any aspect of that.

[The prepared statement of Mr. Rispoli follows:]

PREPARED STATEMENT BY HON. JAMES A. RISPOLI

Good afternoon, Chairman Nelson and members of the subcommittee. I am pleased to be here today to address and answer your questions on the President's fiscal year 2008 budget request for the Department of Energy's Environmental Management (EM) program. I want to thank the subcommittee for its support of the EM program.

The EM mission was undertaken to address the safe and successful cleanup of the Cold War legacy brought about from five decades of nuclear weapons development and government-sponsored nuclear energy research. This mission, as I pointed out last year, is both inherently challenging and innately beneficial to the American people. As this subcommittee knows the EM program has solved several cleanup challenges, including Rocky Flats and Fernald, that at one time seemed insurmountable. We are also making progress on the many other complex challenges that the program still faces. Since I last appeared before this committee, EM has been able to achieve notable results by addressing these challenges through a risk reduction and prioritization strategy and a judicious use of the resources that Congress entrusts to us. EM is implementing this prioritized, risk reduction strategy supported by the crucial tenets of safety, performance, cleanup, and closure.

The President's fiscal year 2008 budget request will allow this prioritized work on these important cleanup and closure projects to continue across the complex. For the EM program, the President's budget request for fiscal year 2008 is $5.4 billion for defense EM activities. We've been able to achieve a decrease of $26 million from the fiscal year 2007 request by employing a thoughtful balance of reducing risk and completing cleanup for the EM program. About half of our budget request will go towards our highest risks activities in stabilizing tank waste, nuclear materials, and spent nuclear fuel, and another quarter is going to clean up contaminated soil, groundwater, and unused facilities. With this request, we are continuing on our strategic course to address high-priority tank waste treatment and radioactive waste disposition while preserving our site completion and closure drive. Under this strategy, we anticipate meeting 90 percent of the approximately 210 scheduled compliance agreement milestones for fiscal year 2008. The Department remains committed to meeting its regulatory milestones and will continue to identify ways to better manage its cleanup activities. Our agreements have provisions for renegotiation of milestones and we are working with our regulators to provide the best benefit to the environment.

With this budget request, the Defense Waste Processing Facility at the Savannah River Site (SRS), the Advanced Mixed Waste Treatment Facility at the Idaho National Laboratory (INL), and the Toxic Substance Control Act Incinerator at the Oak Ridge Reservation (ORR) will continue to operate. Design and construction will continue at the Waste Treatment and Immobilization Plant (WTP) at Hanford, the Sodium-Bearing Waste Treatment Plant at INL, and the Salt Waste Processing Facility (SWPF) at SRS. Tank farm operations will continue at Hanford, INL, and SRS along with spent nuclear fuel receipt, storage, and cleanup. I would like to update you regarding two of these important tank waste projects.

The Waste Treatment and Immobilization Plant at Hanford is the Department's largest capital project. Over the past 18 months, the Department has retained a broad range of external, senior professionals from private industry, academia, and other government agencies to thoroughly review the management issues, technical approach and remaining challenges, adequacy of the design to meet the seismic criteria, and the cost and schedule elements of the WTP project. The results of these reviews, together with implementing the many recommendations, provide the Department with the assurance that the WTP can be built and commissioned as designed to treat and immobilize the high-level waste, and can be executed within the revised cost and schedule baseline.

Also related to the WTP, the John Warner National Defense Authorization Act for Fiscal Year 2007, section 3120, included a limitation on availability of funds, pending the certification by the Secretary of Energy that the Defense Contract Management Agency has recommended for acceptance the earned value management system used to track and report costs of the WTP. This limited obligation or expense of no more than 90 percent of the funds available.

A review of the earned value management system was conducted in November 2006 and eight issues were identified. In February 2007, the WTP contractor submitted corrective actions and those actions should be acceptable to resolve seven issues with only minor revisions. The last issue has proved harder to resolve and, as a result, the certification of the earned value management system by the end of the fiscal year may be in jeopardy.

Salt Waste Processing Facility will provide the high capacity treatment capability necessary for removal of actinides, strontium and cesium from the more than 33 million gallons of salt waste stored in aging underground waste tanks at the SRS. SWPF operation is critical to meeting Federal Facility Agreement commitments to remove waste from the 49 remaining SRS tanks, including the 22 tanks that do not meet modern requirements for full secondary containment and leak detection. The schedule for the project design has been slowed to address seismic issues, which should be resolved in early May. In parallel, the contractor will complete baseline development and that baseline will be validated upon satisfactory completion of an external independent review. This baseline development and validation will support a Fall 2007 Critical Decision 2 (CD–2), which will establish formally the project schedule and cost estimate, against which we report our progress, and provide approval to proceed to final project design.

At the SRS, this request will support ongoing nuclear material processing in H-Canyon and design of the plutonium vitrification project to support ultimate disposition. At Hanford, it supports consolidation of plutonium and unirradiated category 1 and 2 nuclear fuel to an off-site location, pending a consolidation decision. Consolidation of enriched uranium from INL to an off-site location, and design and long-lead procurement for the U–233 disposition project at the ORR are also supported in this request.

This request enables transuranic (TRU) waste projects to continue with priority for INL and Los Alamos National Laboratory (LANL) TRU waste. Other contact and remote-handled TRU shipments to the Waste Isolation Pilot Plant (WIPP) are also supported. Low-level radioactive waste and mixed low-level radioactive waste activities will be supported at Hanford, the Nevada Test Site (NTS), INL, SRS, and ORR.

The request will allow high-priority waste retrieval, soil and groundwater remediation, and decontamination and decommissioning (D&D) of excess facilities at Hanford, INL, SRS, ORR, and other sites. In addition, the request supports targeted technology development and deployment in support of high-level waste, soil and groundwater, and facility D&D.

With this budget request, EM will achieve our goals for risk reduction and cleanup completion at:

- Lawrence Livermore National Laboratory-Site 300, California
- Pantex Plant, Texas
- Sandia National Laboratory, New Mexico (calendar year 2008)

As cleanup work is completed at these sites with continuing missions, EM will transfer long-term surveillance and monitoring activities to the NNSA.

The fiscal year 2008 budget request will allow the EM cleanup program to reduce risk, honor commitments and produce results worthy of the investment of the American people. We are committed to ensuring strong management of this complex cleanup work to secure safe and efficient progress that protects the public, our workers, and the environment. We have shown we can deliver meaningful results. Your continued support will allow us to deliver results important for today, as well as for generations to come.

RISK REDUCTION RESULTS

Recently, we celebrated another success at the completion ceremonies for the Fernald, Ashtabula, and Columbus sites. It is the latest demonstration of our progress following the earlier completion of cleanup at Rocky Flats in Colorado, the Kansas City Plant in Missouri, and the Lawrence Livermore National Laboratory—Main Site in California. All these completions should be recognized as results that have been borne from partnerships founded on mutual respect and collaboration.

EM has also made other significant progress:

- Stabilizing and packaging for disposition all plutonium residues, metals, and oxides (SRS and Hanford);
- Producing well over 2,000 cans of vitrified high-level waste from radioactive tank liquid wastes;
- Retrieving and packaging for disposal over 2,100 metric tons of spent nuclear fuel from the K-Basins on the Hanford site to protect the Columbia River;
- Characterizing, certifying, and shipping close to 37,000 cubic meters of TRU waste from numerous sites to WIPP for permanent disposal;
- Disposing of more than 965,000 cubic meters of legacy low-level waste and mixed low-level waste (contaminated with hazardous chemicals); and
- Eliminating 11 out of the 13 high-risk material access areas through material consolidation and cleanup.

In addition, on a site-specific level, we have:

- Completed disposal at WIPP of all legacy drummed TRU waste from SRS;
- Completed demolition of the 232–Z facility at Hanford;
- Completed cleanup at the Melton Valley area; and
- Completed the first remote-handled TRU waste shipments to the WIPP from INL.

SOLVING THE CHALLENGES

First and foremost, safety is our top priority. We will continue to maintain and demand the highest safety performance. We have taken measures to fully integrate safety into our project designs at an earlier stage while assuring our line project teams have the necessary experience, expertise, and training. Safety will remain a cornerstone in the execution of our mission objectives.

We are actively engaged, both within the Department and externally with our regulators and stakeholders, in identifying issues that impact our mission objectives. We have been challenged by lower than expected performance levels, increased scope, and unrealized planning assumptions. As we identify issues that could affect future performance and regulatory commitments, we are taking significant steps to improve our operations in planning and executing our work. We are applying lessons learned to help prevent future occurrences that will impact our planning and commitments.

One of my goals as Assistant Secretary is that at least 90 percent of our "projectized" portfolio will meet or exceed our cost and schedule targets. We have begun the process of integrating our management tools into our business processes. Over the past year, I have personally conducted Quarterly Performance Reviews of all EM projects with our leadership team. I report to you that we have showed progress, but we have yet to realize the full potential of implementing our management systems and better applying risk management principles—that is, identifying project uncertainties and developing mitigation measures. Some of our projects have fallen short of expected performance, but we are engaging our field management contractors with state-of-the-practice project management methods.

Over the last year, it has become apparent that we have not yet attained our full potential in our procurements, and in our execution of projects. We have instituted measures to strengthen our emphasis on program execution. This multi-year objective already is producing results that should provide more effective management in the future. This initiative is being coupled with additional training for Federal managers and staff to enhance project management and acquisition skills. This integrated approach will deliver dividends for our managers in the long-term.

We are improving our ability to ensure that proper procurement vehicles are available to meet our acquisition strategies. We are taking a new look at contract types and fee structures within our contracts. EM must acquire the best services including those of small business, to meet our business objectives and to become a top-performing organization.

I have asked my senior leadership at Headquarters and in the field to take immediate actions to ensure that everyday operating processes reflect lessons learned.

Lastly, in conjunction with the National Academy of Public Administration, EM has undertaken a review of our organization and its associated functions and authorities. To date, the process has identified areas for improvement, along with some refinements of our organizational alignment. During the next few months, EM will be implementing the resulting recommendations to ensure we have an organizational structure that will enhance our ability to respond to the needs of the mission.

THE FISCAL YEAR 2008 BUDGET REQUEST

The Department's fiscal year 2008 budget request for defense EM activities totals $5,364 million. The fiscal year 2008 budget request reflects safety as its utmost priority. EM is committed to our safety principles and to maintaining the highest safety performance to protect the workers, the public and the environment.

The budget request reflects prioritizing program work to balance the goals of risk reduction; completing ongoing work to achieve completion at sites; and meeting our environmental commitments. For fiscal year 2008, EM's funding priorities are listed in order of risk, to best address our cleanup challenges:

- Requisite safety, security, and services across EM cleanup sites;
- Radioactive tank waste storage, treatment, and disposal;
- Spent nuclear fuel storage, receipt, and remediation;
- Other transuranic, low-level, and mixed low-level wastes treatment, storage, and disposal;
- Special nuclear materials storage, processing, and disposition;
- Soil and groundwater remediation; and
- D&D of contaminated facilities.

Examples of milestones and planned activities for fiscal year 2008 by site-specific categories are:

Hanford

Richland

- Consolidate, package, and remove spent nuclear fuel and other radioactively-contaminated materials within the K Basins (K-East and K-West).

The K Basins project is a high priority, risk reduction activity due to its close proximity to the Columbia River. The goal of this project is removal of all spent nuclear fuel, radioactive sludge, contaminated K Basin water, and radioactive debris from the K Basins. The endpoint of the K Basins cleanup will mean the removal of more than 55 million curies of radioactivity that pose a threat of leakage to the surrounding environment, including the Columbia River.

- Amplify River Corridor remediation activities for Reactor Areas D, F, and H.

The River Corridor Closure Project will complete remediation of contaminated waste sites; the D&D and demolition of facilities that are adjacent to the Columbia River; and placement of eight reactors into an interim safe storage condition. The work performed within the River Corridor Closure Project includes digging up contaminated soil, constructing interim safe storage (cocooning) of the reactors, demolishing facilities in the old reactor complexes and facilities in the 300 Area, disposing of waste in the Environmental Restoration Disposal Facility, and constructing surface barriers or caps over contaminated sites.

- Continue retrieval of contact-handled suspect transuranic waste and scheduled shipments to WIPP.

The Hanford Site contains thousands of containers of suspect transuranic waste, low-level, and mixed low-level wastes. The end point of this project will include the retrieval of contact-handled suspect transuranic waste in the low-level burial grounds, the treatment of mixed low-level waste, the disposal of low-level waste, and certification and shipment of transuranic waste to WIPP.

- Continues groundwater/vadose zone remediation activities.

Due to 40 years of weapon production processes, Hanford's groundwater has been contaminated with carbon tetrachloride, chromium, technetium-99, strontium, and uranium plumes. EM is dedicated to preventing the potential for contaminates reaching the groundwater by: decommissioning an additional 100 unused groundwater wells; monitoring 700-plus wells for contaminants of concern above drinking water standards; and, commencing design of final remediation actions to address carbon tetrachloride and technetium plumes.

Office of River Protection

- Sustain tank farm closure processes and maintain the tanks in a safe and compliant condition.

The radioactive waste stored in Hanford tank farms has been accumulating since 1944. Due to the age of the tanks, a number have leaked in the past into

surrounding soil and groundwater. In order to reduce the risk of future tank leaks into the environment, the overall objectives of this project include the stabilization of radioactive waste stored underground in tanks, including retrieval, treatment, disposal, and closure of the facilities.

• Progress on path forward for the Waste Treatment and Immobilization Plant.

The Waste Treatment and Immobilization Plant (WTP) is critical to the completion of the Hanford tank waste program by providing the primary facility to immobilize (vitrify) the radioactive tank waste at the Hanford Site. The WTP complex includes five facilities: the Pretreatment Facility, the High-Level Waste Facility, the Low-Activity Waste Facility, the Balance of Facilities, and the Analytical Laboratory. In fiscal year 2008, the WTP project team plans to complete: close-in of the Annex building in the Low-Activity Waste Facility; installation of roofing and completion of the building shell for the Analytical Laboratory; construction of the water treatment building in the Balance of Facilities; and renewal of construction for the High-Level Waste Facility and the Pretreatment Facility.

Idaho

• Transfer spent nuclear fuel from wet to secure dry storage.

Promote the safe and secure receipt, dry storage, and packaging and future transfer of the spent nuclear fuel to a Federal geologic repository at Yucca Mountain.

• Continue shipments of transuranic waste to the WIPP.

Maintain program activities that support waste characterization, packaging, and transportation of remote-handled transuranic waste to WIPP that lead to reduced surveillance and operation costs.

• Pursue ongoing sodium-bearing waste treatment facility construction, including efforts to gain necessary regulatory approvals for sodium bearing waste treatment and disposal.

The overall objective of this project is treatment and disposal of the sodium-bearing tank wastes, closure of the tank farm tanks, and performance of initial tank soils remediation work. Construction and operation of the sodium-bearing waste facility will reduce potential risk to human health and the environment by preventing the potential migration of contamination into the Snake River Plain Aquifer, which is a sole-source aquifer for the people of Southeastern Idaho.

LANL

• Characterize, certify, and ship above-grade transuranic waste inventory.

The Solid Waste Stabilization and Disposition Project includes the treatment, storage, and disposal of legacy transuranic and mixed low-level waste generated between 1970 and 1999 at LANL. Final disposal of the legacy transuranic waste from LANL will reduce risk to workers, as well as reduce security costs associated with transuranic waste.

• Promote soil and water remediation and monitoring.

The LANL Soil and Water Remediation Project's objective is to identify, investigate and remediate, when necessary, areas with chemical or radiological contamination attributable to past Laboratory operations.

In fiscal year 2008, in order to fulfill the objective of protecting and monitoring the regional aquifer, as well as long-term surveillance and monitoring to provide necessary safeguards and protection for surface and ground waters, the following activities are planned:

- Perform groundwater monitoring at all major watersheds: LA/Pueblo; Mortandad; Canon de Valle; Sandia; and in close proximity to the major waste sites;
- Conduct stormwater sampling and implement erosion control measures;
- Install and monitor four wells in Pajarito and Bayo canyons; and
- Complete construction of 260 Outfall Corrective Measures for alluvial and surface water treatment system.

Oak Ridge

• Continue design of U–233 down-blending project and begin Building 3019 modifications

Down-blending the Building 3019 inventory for disposition is in accordance with the national nonproliferation goals by making the U–233 material unsuitable for use in weapons and reducing security costs at the Oak Ridge National Laboratory.

• Ship contact-handled transuranic waste to WIPP.

Process 250 cubic meters of contact-handled transuranic debris and 170 cubic meters of remote-handled transuranic debris with shipments to the WIPP; and continue to dispose of low-level/mixed low-level waste at the NTS.

• Complete the Molten Salt Reactor Experiment fuel salt removal remediation project.

Upon completion of active remediation, surveillance and maintenance activities of the Molten Salt Reactor Experiment facility will be provided until decontamination and decommissioning of the site has occurred.

Savannah River Site

• Consolidate on-site Plutonium to K Area.

In order to meet the Department's Design Basis Threat criteria, plutonium at SRS is being consolidated into one Category 1 Special Nuclear Materials Storage Facility. The receipt, storage, and disposition of these special nuclear materials at the SRS allows for deinventory and shutdown of other DOE complex sites, while providing substantial risk reduction and significant mortgage reduction savings to the Department.

• Ship all legacy transuranic waste to WIPP and treat low-level waste and mixed low-level waste.

In fiscal year 2008, SRS plans to dispose of transuranic waste previously characterized as mixed low-level waste; dispose of low-level waste and newly generated waste, including soil, groundwater and decontamination and decommissioning wastes; dispose of mixed low-level waste inventory and newly generated waste; and dispose of hazardous waste inventories, thus reducing potential exposure to project workers.

The end-state for this project is the shipment of all legacy transuranic waste to the WIPP, the treatment of PUREX waste, and the elimination of all legacy inventories and disposition of newly generated low-level waste, mixed low-level waste, and hazardous waste.

• Continue groundwater corrective actions across the Site.

SRS is working to prevent the spread of contamination into adjoining groundwater aquifers and nearby surface waters. Existing contamination in vadose zones, groundwater and surface water sediments are currently being cleaned up, thereby reducing the risk to site workers, the public and the environment.

• Treat, stabilize, and dispose legacy radioactive waste stored in underground storage tanks.

The continuation of the design and construction of the Salt Waste Processing Facility will aid the Defense Waste Processing Facility in the process of safely disposing of the liquid tank wastes. The Salt Waste Processing Facility will separate the high-activity fraction from the low-activity fraction of the salt waste stored in the underground tanks at the SRS. The completion of the Salt Waste Processing Facility will support the mission of SRS in meeting its Federal Facilities Agreement commitments for waste tank disposition.

WIPP

• Operate the WIPP in a safe manner to support disposal capabilities for transuranic waste.

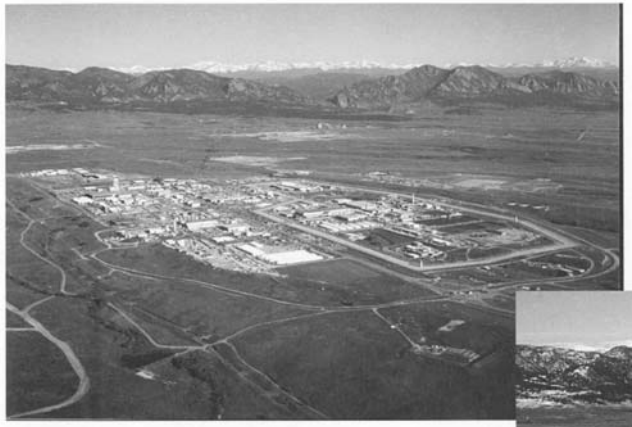
The WIPP in Carlsbad, New Mexico, is the Nation's only mined geologic repository for the permanent disposal of defense-generated transuranic waste. All of the defense-generated transuranic waste from eligible generator sites must come to WIPP for receipt, handling, and disposal.

CONCLUSION

The fiscal year 2008 budget request enables risk reduction to continue. Challenges lie ahead but we are focused on our objectives and our strategy. Safety, performance, cleanup, and closure underpin our actions and initiatives. We are committed to work with all interested parties to resolve issues. We look forward to continuing to work with this subcommittee and Congress to address your concerns and interests. Our success relies on our effective partnerships with our regulators, the communities, and our contractors to produce progress in accomplishing meaningful results for the American public.

I look forward to a continuing dialog with you and the subcommittee. This concludes my formal statement for the record. I will be pleased to answer any questions at this time.

Rocky Flats Site

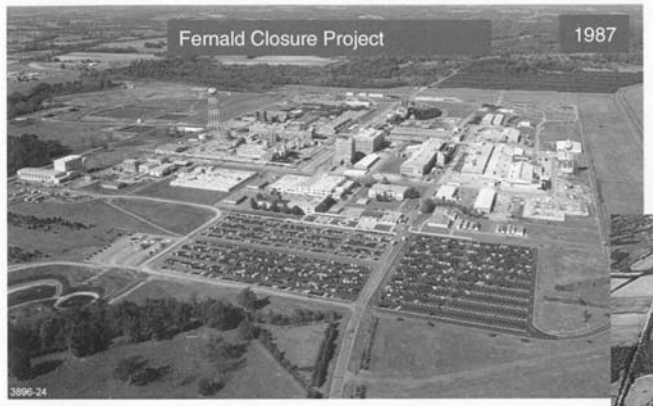


EM Environmental Management

safety ❖ performance ❖ cleanup ❖ closure

www.em.doe.gov

Fernald Closure Project



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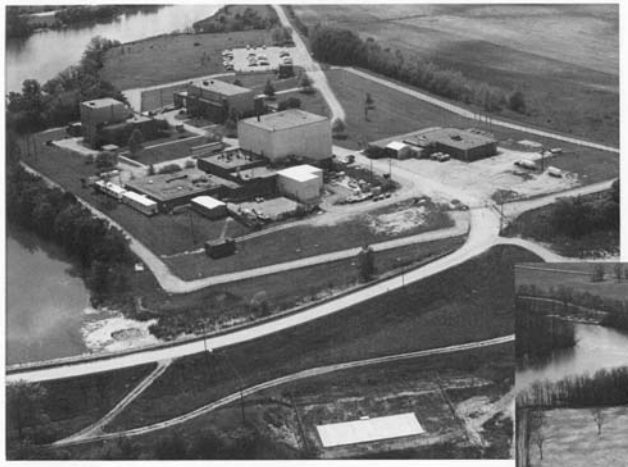
Columbus Closure Project



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Ashtabula Closure Project

EM Environmental Management

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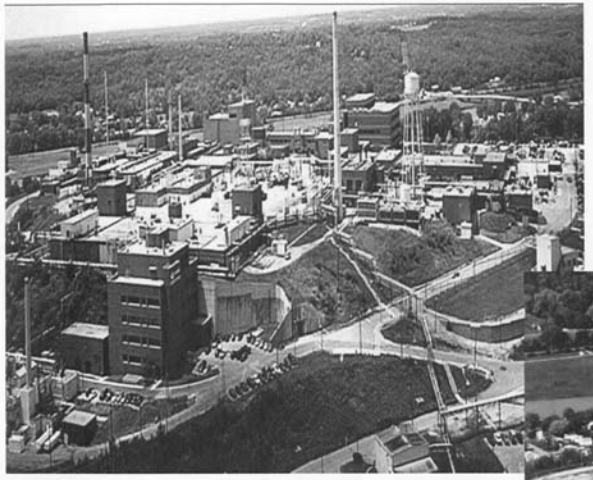
Miamisburg Closure Project



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Oak Ridge Reservation - Melton Valley

Completed September 30, 2006

EM Environmental Management

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Savannah River T-Area

First Remote-Handled Transuranic Waste Shipment to Waste Isolation Pilot Plant

EM Environmental Management

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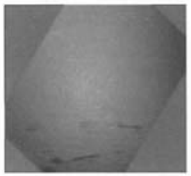
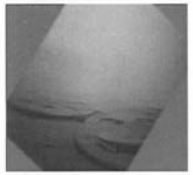
K East Sludge Containerization

After

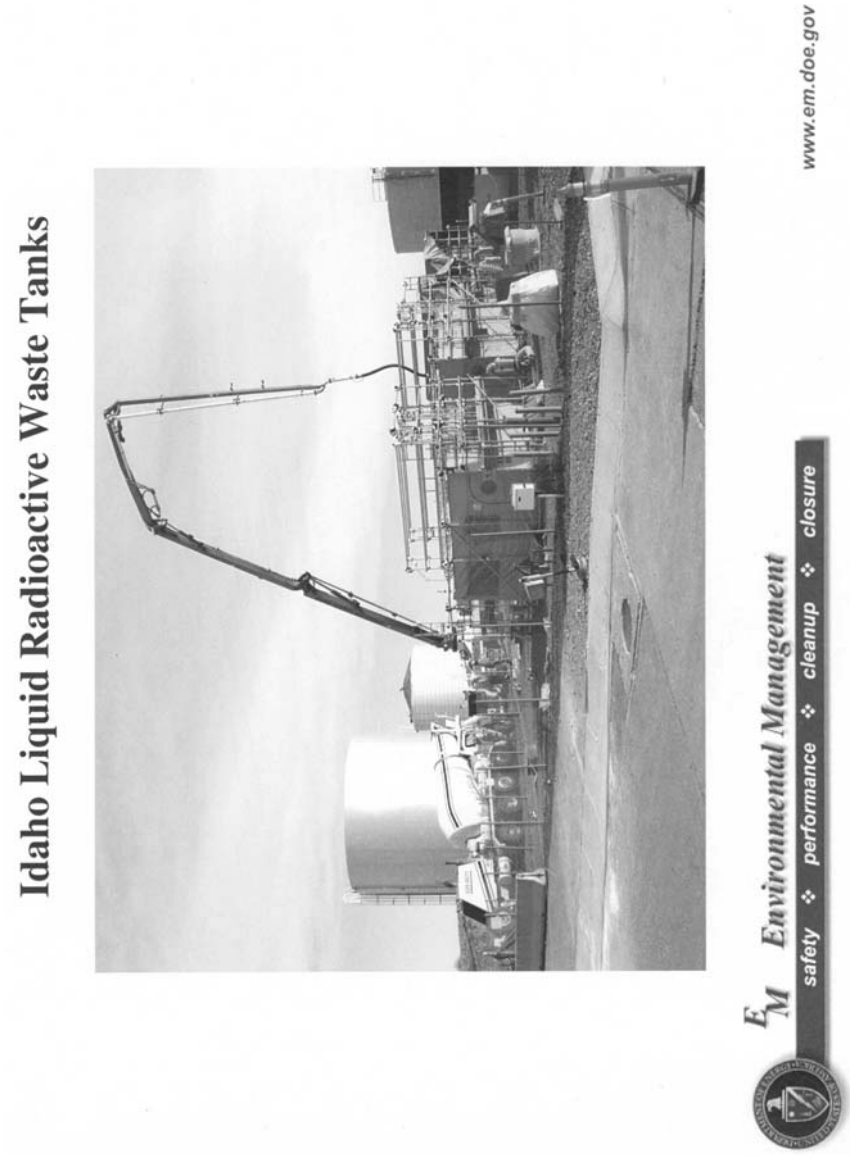


East Bay



West Bay Floor

Center Bay



Senator BILL NELSON. Let me just ask you. You have been reviewing the earned value management system and the Defense Contract Management Agency (DCMA) has changed its valuation methods, so there is a new approach. Now, if this new approach were to be applied to the waste treatment project then there would be another delay. So can you explain what is the problem and is there a way to resolve the situation with the DCMA?

Mr. RISPOLI. Yes, Mr. Chairman. I have visited with the director of the DCMA and your information that they have changed their approach is, in fact, true. They have essentially ratcheted up their interpretation of how to implement the American National Standards Institute criteria. There are 32 criteria for earned value management systems.

The DOD has ratcheted up, to their credit, the way they interpret that those criteria should be established, and their approach is geared more towards a weapons system, like an airplane or a ship. They do not do a lot of reviews of construction projects. In fact, when we asked them to give us an example of another construction project that met their expectation, they could give us no example.

I should back up a moment. This committee sponsored language last year in statute that requires the DCMA to certify our earned value management system. We are still working toward that end. Meanwhile, the Department has brought in another contractor separate from EM, separate from my organization that does this as part of their business, reviews earned value management systems.

In fact, they have been recognized, this company has been recognized, by the Defense Department as being preeminent in their field. I can share that with you after the hearing if you would like, the web site that shows that.

We are using that company to give us an independent look at the earned value management system at the project. They are out there this week, in fact. They have been there all week for their second visit.

So we are taking, you might say, a dual track approach. One is to continue to work with the DCMA to see if we can satisfy their concerns about the way they interpret the criteria, meanwhile going to this other company that is also recognized by the Defense Department as a preeminent expert in the area to see what they think about our earned value management system.

The earned value management system is one of several project management tools that we rely on to gauge the success and the health of a project as it goes forward. That is why this is an important element of what we look at, the earned value management system.

Senator BILL NELSON. What is the name of that company?

Mr. RISPOLI. The name of that company is Tecolote. They are based in Santa Barbara, California, and, as I indicate, they are one of the preeminent companies identified by the Department of Defense (DOD) as being expert in their field.

Senator BILL NELSON. The DCMA was close to completing its review of the Bechtel earned valve management (EVM) system when it changed its approach. The current law requires them to make a recommendation to the Secretary on the EVM system. In the absence of the DCMA, would you have some outside review of the EVM system?

Mr. RISPOLI. Our intent, Mr. Chairman, is to keep your staff apprised of the progress of our activities with both the DCMA and this company called Tecolote, and as we go forward you, this committee through your staff, will know how we are doing on both fronts, both with the DCMA and with Tecolote. Of course, it would

be within your purview to change the requirement that there be independent certification, without that certification necessarily being the DCMA.

I can assure you that we want the same thing. We want assurance that the system that we are using and relying on is legitimate. So by bringing in Tecolote—the Department chose them, not my organization. But they are a recognized front-runner in this field, and again I can share that information with your staff.

Senator BILL NELSON. Jeff, you jump in.

Senator SESSIONS. The waste treatment plant, the design has been approved and the contract is in the course of being executed, is that correct?

Mr. RISPOLI. Yes, sir, that is true.

Senator SESSIONS. You have an extra $3 billion contingency money there?

Mr. RISPOLI. Yes, sir, that is correct.

Senator SESSIONS. Well, my experience is if the contract is everybody thinks there is a $3 billion contingency there, some of it might get used. Are you confident that you are going to do everything possible to preserve every penny of that $3 billion?

Mr. RISPOLI. Senator Sessions, our intent is, we are in the midst now of renegotiating that contract. The Government is preparing its position and our intent is to provide strong incentives. You, I am sure, are aware of the Rocky Flats contract, where we delivered 14 months early and quite a bit below the Government's estimate. We would use the same lessons learned as we negotiate this contract to provide a very strong incentive for the contractor to deliver both early and under budget. So that would be our intent.

I would also point out that if you take away the $3 billion in contingency from the $12.2 billion, the actual hard cost estimate this time is based upon nearly 80 percent design. So the estimate was, for the most part, a bottoms-up cost estimate. It took the Army Corps of Engineers a year to review the contractor's cost estimate with 30 people on site. It is a huge project.

So we have a great degree of confidence that the estimate this time is much more sound than it was years ago when the estimate was based upon very immature engineering. This time, as I say, we are nearly 80 percent designed and the project has gone through an intense review by the Army Corps.

Senator SESSIONS. That part of it is sort of a done deal. I mean, that contract is let and it is going forward. Then the additional cost will come as the waste liquid is brought in and processed, is that right?

Mr. RISPOLI. Yes, sir.

Senator SESSIONS. Let me just say, I remember in Alabama at the Anniston Army Depot, when we went through the destruction of poison gas. There were serious differences of opinion. There was a chemical reaction where it could be poured, a chemical could be poured over, and this was supposed to neutralize the gas, or burning, and we went through that. I am not sure how smart we were, but it was all discussed.

Have there been any other suggestions? Has any effort been made to ascertain if some other sharp person could develop a different way of handling this waste, rather than something that is

going to cost us $173 billion, to be sure that all the other options—when you talk about that big a commitment, I think it is incumbent on us to ask ourselves rigorously, is there any other option to this.

Mr. RISPOLI. The answer to that is, I believe, Senator Sessions, that when the choice was made to go with this vitrification process for both the high level and the low activity waste, there was a very significant scrub, if you will, of what options were available. I have been in this position since August 2005 and I have heard of no suggestion that any other technology would work better.

The reason is that we have experience with vitrification both at West Valley, New York, where we built a plant, operated it, and then closed it down because it finished its job on a much smaller scale, and the one in Savannah River in South Carolina is still operating reliably after a number of years, at least 5 that I am aware of.

So we are confident that the technology is proven and reliable and that we can use it to process the waste.

Senator SESSIONS. It is proven and reliable, I do not dispute. But it is expensive. What about the effort in Savannah River? Senator Graham is a member of this committee. He was very pleased. As I recall, South Carolina worked with the DOE and a plan was developed that was substantially less expensive than some of the earlier estimates. Are you aware of that history?

Mr. RISPOLI. Yes, sir.

Senator SESSIONS. How much difference did it turn out to be? I have forgotten how much it saved. Do you know how many billion dollars less it turned out to be?

Mr. RISPOLI. I do not know how much that initial vitrification plant cost. As I indicated, it has been operating for a number of years. But that vitrification plant in South Carolina will only handle 3 million out of 37 million gallons of waste at that site. So there is other construction in design today, not yet built, that has already been presented to Congress and it is well known as an upcoming project, to build what I would call the balance of the plant needed, to kind of duplicate what is at Hanford. But because it is a much smaller number of gallons to go through it, the plant will be smaller and it does not have to be sized as big or as robust.

Senator SESSIONS. Well, let us just pursue that. Are you saying that the net cost per gallon of product processed is going to be equal in South Carolina to the Hanford site?

Mr. RISPOLI. I do not know the net cost per unit. I can get that to you. I could take that question.

[The information referred to follows:]

The cost per unit is reflected on the chart on page 279.

Senator SESSIONS. In addition to that, of course, just processing the liquid, then you have to do things, you have to consider what to do about the site itself, correct?

Mr. RISPOLI. Yes, sir.

Senator SESSIONS. Can you give us an estimate of how much goes into processing the liquid and how much would be in processing and cleaning up the site, as planned in this project?

Mr. RISPOLI. At Hanford, after the plant is built and fully operational, which is in around the 2019 timeframe, we are envisioning operating all the way into the 2030s with that plant. So it will be many years of operation of that plant to process the waste out of the 177 tanks.

Now, we are already taking waste and concentrating it so that we can try to get some tanks, the higher risk tanks, empty——

Senator SESSIONS. Is there a cost figure on that processing the liquid waste and then a cost figure on cleanup of the site in addition? Are there additional funds to be spent on that?

Mr. RISPOLI. Yes, there is. But again, I would have to get that to you for the record. You mean the life cycle cost to clean up the Hanford site. Senator, I will get you that for the record.

[The information referred to follows:]

LIFE CYCLE COST TO CLEAN UP HANFORD

The life-cycle cost estimate for processing the 53 million gallons of high level waste at Hanford is $56.5 billion which includes construction of the Waste Treatment Plant ($12.3 billion) and tank waste retrieval, treatment operations, storage of the high-level waste canisters, onsite disposal of the low activity waste canisters, decommissioning and decontamination of the Waste Treatment Plant, and closure of the 177 high level waste tanks ($44.2 billion *). The life-cycle cost includes costs beginning in 1997 through 2042. From 1997 through 2007 the Department has expended $8.6 billion; $4.8 billion for the Waste Treatment Plant construction and $3.8 billion for tank farm operations and infrastructure improvements, demonstration of tank waste retrieval systems, and construction of a high-level waste canister storage facility. The cost to complete the remaining work includes $7.4 billion to complete construction of the Waste Treatment Plant; $10.4 billion for waste processing; $25.5 billion for tank farm operations, waste retrieval, high-level waste canister storage, and low activity waste disposal; $1.1 for decommissioning and decontamination of the Waste Treatment Plant; and $3.4 billion for closure of the 177 high level waste tanks.

The life-cycle cost estimate for cleaning up the remaining portion of the Hanford reservation is $29.6 billion which includes $12.5 billion for nuclear facility decontamination and demolition, $11.8 billion for nuclear material, spent nuclear fuel and solid waste stabilization, $2.1 billion for soil and ground water remediation, $2.3 billion for safeguards and security, and $0.9 billion for other support activities. $8.8 billion has been expended on these activities through 2007.

A table summarizing the life-cycle cost for each portion of the Hanford Site cleanup is provided below.

* The Deputy Secretary of Energy approved an increase in the life-cycle cost from $26.2 billion to $44.2 billion for this project baseline summary, ORP–0014 Tank Farm Operations, subsequent to the submittal of the fiscal year 2008 Congressional Budget Request.

LIFE-CYCLE COST FOR THE HANFORD SITE
Costs in thousands of dollars

Office of River Protection	1997-2007 Cost	2008-2042 Cost	Life-cycle Cost
Waste Treatment Plant Construction	4,839,613	7,423,387	12,263,000
Waste Treatment Plant Operations	-	10,391,000	10,391,000
Tank Farm Operations, Tank Waste Retrieval, Storage of HLW Canisters and Disposal of Low Activity Waste Canisters	3,800,285	25,505,119	29,305,404
Waste Treatment Plant Decommissioning and Decontamination	-	1,132,000	1,132,000
Closure of 177 HLW tanks		3,392,593	3,392,593
Total Office of River Protection	8,639,898	47,844,099	56,483,997

Richland Operations Office	1997-2007 Cost	2008-2042 Cost	Life-cycle Cost
Nuclear Facility Demolition	2,791,105	9,680,315	12,471,420
Solid Waste Stabilization	1,461,557	4,986,456	6,448,013
Nuclear Material Stabilization	1,362,200	1,624,055	2,986,255
Spent Nuclear Fuel Stabilization	2,044,421	320,645	2,365,066
Safeguards and Security	453,622	1,819,337	2,272,959
Soil and Ground Water	492,512	1,647,501	2,140,013
Regulatory Support	143,056	658,881	801,937
Disposal Operations	65,037	15,948	80,985
Total Richland Operations Office	8,813,510	20,753,138	29,566,648
TOTAL HANFORD SITE	17,453,408	68,597,237	86,050,645

Senator SESSIONS. Could you explain to me what Senator Lindsey Graham meant last year when he said that South Carolina worked with the DOE and they agreed on a cleanup method that saved a considerable sum of money? What was he talking about?

Mr. RISPOLI. I presume that he was talking about the project that is now under construction, that will enable us to take the remaining low-activity waste and dispose of it on site. This committee itself was the instrumental committee in the 2005 National Defense Authorization Act that gave us authority for the Secretary to make a waste determination to leave low activity waste on site. That determination is called section 3116 of the 2005 National Defense Authorization Act and it applies to South Carolina and to Idaho.

So what this committee did, and Senator Graham was one of those instrumental in it, was give us the authority for the Secretary to make a determination, in consultation with the NRC, that we could leave the low activity waste on site in South Carolina.

Senator SESSIONS. Is that planned in Hanford?

Mr. RISPOLI. The current plan at Hanford is that we will leave the low activity waste on site, yes, sir.

Senator SESSIONS. In the same fashion?

Mr. RISPOLI. It will be vitrified, but it will be on site, yes, sir.

Senator SESSIONS. Is that the same fashion as South Carolina did it?

Mr. RISPOLI. The waste form is different in that. It is going to be a grout waste form in South Carolina and a glass waste form in Hanford. But it is the same outcome in that we are leaving low——

Senator SESSIONS. Is that a factor in the different cost?

Mr. RISPOLI. I will get that for you, and I will reduce it to per unit so that you can see per unit.

[The information referred to follows:]

The cost per unit is reflected on the chart on page 279.

Senator SESSIONS. I would just say to you, $173 billion is almost what it costs to fight the Iraq war for 2 years. It is a lot of money.

Senator BILL NELSON. Let me ask about Savannah River. So are you saying there are plans for moving materials outside of Idaho or South Carolina?

Mr. RISPOLI. The statute that was originated with this committee enables us to leave—to make a determination to leave low activity waste on site. At Savannah River site, that low activity waste determination that we have already made would actually put it into on-site vaults in a grout form. In the future we would expect to be using that authority to also grout the empty tanks, which is the same intent at Hanford, that we would grout the empty tanks once they are emptied.

So the overall approach is very similar. The difference is, and you picked up on this, is that the low activity waste at Hanford will be vitrified. The low activity waste at Savannah River will be put into a saltstone form, which is a grout, and into vaults. But yes, the answer is the low activity waste will be left on site in both. That is the intent. The intent also is that the tanks once emptied would be grouted to protect the public and the environment, so that the tanks are one monolithic entity from that point forward.

Senator BILL NELSON. The high activity waste eventually would be encased in glass and sent to——

Mr. RISPOLI. Yucca Mountain.

Senator BILL NELSON. —Yucca?

Mr. RISPOLI. Yes, Mr. Chairman. At all three—at West Valley, New York, at the Savannah River site, and also at Hanford.

Senator BILL NELSON. You just need Congressional authorization to send it to Hanford?

Mr. RISPOLI. Actually, we are okay. We meet all of the acceptance criteria for sending the waste to Yucca. Yucca in its present legal limit of how much it can accept already can accept all the waste from the Savannah River site. In its present legal limit, not physical limit, it would not be able to accept all the waste from the Hanford site. Physically, it could, but there is a legal cap on how much could go to the Yucca Mountain site.

Senator BILL NELSON. Do not worry, Mr. Podonsky; we are getting to you.

Mr. PODONSKY. I am waiting patiently.

Senator BILL NELSON. Well, on this consolidation of the materials, tell us what is the status of the effort to complete the nuclear materials consolidation study?

Mr. RISPOLI. Yes, Mr. Chairman. In 2005 the Department established an across-the-Department committee, you might say a cross-cutting committee, to look at for all elements that have nuclear materials, such as plutonium, what could be done to consolidate that material. The committee has basically presented an approach that would in fact consolidate all of that special nuclear material, most

of it, to the Savannah River site, with the intent of actually running it through a disposition process at the Savannah River site, such that it could either go through the MOX plant, which would make it usable as a nuclear reactor fuel, or disposition it in some other way.

So we have already announced what the intent would be. Now, there is more work to be done; we would have to still finish all of the other requirements, such as the National Environmental Policy Act—but the intent would be that the special nuclear materials at Hanford, for example, would be taken out of Hanford, which would save the Department an enormous amount of money, both initial capital construction to enhance the security, to meet the required security parameters, as well as the extra guns and guards that would have to continue to protect that material at Hanford if we did not move it.

So from our programmatic perspective, we are very eager to implement this consolidation approach, to get that special nuclear material out of Hanford, to save the money at that site.

Senator BILL NELSON. That is plutonium 239?

Mr. RISPOLI. Yes, sir, all plutonium and also some uranium materials.

Senator BILL NELSON. When will that material be shipped from Hanford?

Mr. RISPOLI. It would all hinge on the final approval of the overall plan, because there is another Federal statute that basically provides that until the Department can demonstrate a disposition path for all the plutonium that would go into South Carolina, we cannot bring the material into South Carolina. Right now we are awaiting the ability to begin construction at the MOX plant, which is not in my program. It is in the Nuclear Nonproliferation side of the house. We would then be able to demonstrate the ability to disposition all this material.

I might mention that only today, a report was delivered to the appropriate committees here in Congress, including yours, a business case analysis that shows the approach for dispositioning this material at the Savannah River site. I do not think you would have had a chance to, or your staff, to digest it, but I have a copy that I could leave if your staff would like it after the hearing.

Senator BILL NELSON. Mr. Podonsky, is that going to be safe, to move it from Harford to Savannah River?

STATEMENT OF GLENN S. PODONSKY, CHIEF HEALTH, SAFETY, AND SECURITY OFFICER, DEPARTMENT OF ENERGY

Mr. PODONSKY. We would be happy to inspect Mr. Rispoli's activities to let you know whether they are safe or not. But that is part of what we do, independently assess the performance of the Department in a number of areas.

If I might, Mr. Chairman——

Senator BILL NELSON. Yes, please.

Mr. PODONSKY. —I would like to first, of course, thank you, Mr. Chairman and Senator Sessions, for inviting me to testify.

I think it is important to just take a moment, if you will allow me, to talk about the Health, Safety, and Security Office. It was just created 7 months ago by Secretary Bodman to incorporate a

new way of doing management within the Department, especially in the two biggest areas of what we call the mortgage payment of the Department, safety and security.

Within my office, we are responsible for establishing the policy for the entire Department for environment, safety, health, and security including the National Nuclear Security Administration (NNSA). We also do independent oversight, independent of the line. So in other words, we inspect Mr. Rispoli as well as all the other assistant secretaries that have facilities in the Department. We inspect them for their performance with the standards and requirements from the Department in all the areas of environment, safety, health, safeguards, security, cybersecurity, and emergency management.

Our office is also responsible for technical assistance to the field in areas where they are having difficulties in all of the areas I just mentioned, as well as we have the Office of Classification. We also are responsible for training. We have a training center out in Albuquerque that does the professional training for safety and security professionals.

The other part that we also have, which is very important, is the enforcement function, which enforces the civil penalties for DOE Orders 824, which is on security, the worker health and safety rule, 851, and also the Price-Anderson, nuclear safety rule, which is 820.

So part of our responsibilities for the Secretary is evaluating the performance of the Department in all of those areas. So when you ask the question, will it be safe to move from one facility to another, we would look at what the program offices plan to do and then we would actually inspect them against their plans. The way we inspect them is we actually bring in trained adversaries that are comparable to Delta Force, Navy SEALs, for our environment, and make sure that they can in fact fend off any attempt to steal the nuclear material or to divert it or any number of issues that we want to test.

Again, we test them against what they say they can do and we test them against the performance of the requirements that they are supposed to perform to.

[The prepared statement of Mr. Podonsky follows:]

PREPARED STATEMENT BY GLENN S. PODONSKY

INTRODUCTION

Chairman Nelson, Ranking Member Sessions, and members of the subcommittee, thank you for inviting me to testify today on the Department of Energy's fiscal year 2008 budget request for the Office of Health, Safety and Security (HSS). On October 1, 2006, the Secretary of Energy established HSS to integrate certain Department of Energy (DOE) Headquarters-level functions for health, safety, environment, and security into one unified office. This new organization reflects the Department's commitment to maintain a safe and secure work environment for all Federal and contractor employees and the surrounding communities and stresses the importance of delineating clear roles and responsibilities and line management accountability for these programs. Since its creation, this new office has begun the process of strengthening these important functions through increased clarity in the assignment of responsibilities and accountability. The fiscal year 2008 HSS budget request includes the funding of the former Environment, Safety, and Health (EH) program within the Energy Supply and Conservation and Other Defense Activities appropriations, and the funding of the former Security and Safety Performance Assurance (SSA) program within the Other Defense Activities appropriation. The HSS program

provides a highly focused and integrated corporate-level analytical capability to identify problem areas and to provide the basis for line management to implement effective Department-wide solutions in the areas of health, safety, environment, and security.

As the Department's central organization responsible for health, safety, environment, and security, HSS provides corporate-level leadership and strategic vision to coordinate and integrate these programs. It provides the Department with effective and consistent policy development, technical assistance, education and training, complex-wide independent oversight, and enforcement for health, safety, environment, and security programs. HSS integrates worker health, safety, environment, and security functions to address crosscutting Departmental issues, increase collaboration and sharing of technical expertise, and increase management accountability for health, safety, environment, and security responsibilities. This integrated approach and functional alignment of responsibilities reduces overlap in reporting and provides consistency in developing policy and guidance and providing technical assistance, while increasing the effectiveness of communication and accountability for worker health, safety, environment and security. As the Chief Health, Safety, and Security Officer, I advise the Deputy Secretary and the Secretary on a wide range of matters related to health, safety, environment, and security across the complex.

Before addressing the HSS budget request and priorities, we want to make clear that one of the primary objectives in creating HSS was to build upon the dedicated efforts, and positive impact made by the previous EH and SSA organizations and to continue their work in a more integrated and effective manner to further strengthen these important functions. For example, the HSS Office of Independent Oversight continues to have a rigorous and multi-faceted oversight program. At the time of the recent security problems at Los Alamos National Laboratory (LANL), HSS was conducting a combined safeguards and security, cybersecurity, and emergency management independent oversight inspection at LANL. Subsequent to that inspection, HSS conducted a Personnel Security Follow-up Review of the NNSA Service Center Personnel Security Program that included an extensive review of all case files for the timeframe of interest. Additionally, as directed by the Secretary of Energy, HSS led a task force to review the Department's Personnel Security Program to determine whether there are deficiencies in the program or program implementation throughout the Department. Further, in November 2006, HSS initiated a security enforcement investigation under the provisions of 10 CFR 824 (Procedural Rules for the Assessment of Civil Penalties for Classified Information Security Violations) into the recent LANL security event, the first such investigation undertaken by the Department.

The Secretary of Energy is ultimately responsible and accountable for the performance of DOE, including NNSA. Through HSS, the Secretary establishes Department-wide environment, safety, health, and security policy, which also applies to NNSA. The Secretary relies on HSS to conduct corporate independent oversight of all safety and security disciplines, and expects NNSA to respond to all findings with effective corrective actions to eliminate weaknesses. As a result, it is imperative for HSS to maintain a close working relationship with NNSA. The roles of certain elements within NNSA, such as the Office of Defense Nuclear Security, are complementary to HSS in providing policy, assistance, training, and oversight. The role of the Office of Defense Nuclear Security is to provide a line management oversight function by advising the Administrator, NNSA, on the status of security within NNSA.

FISCAL YEAR 2008 BUDGET REQUEST OVERVIEW

The Office of HSS's budget request for fiscal year 2008 of $428.358 million includes $328.315 million for HSS Programs and $100.043 million for Program Direction. A summary of the HSS programs and activities proposed to continue in fiscal year 2008 with this funding request include:

Health and Safety Policy, Standards, and Guidance ($4,203,000)

DOE issues policy, standards, and guidance to ensure workers and the public, property, and the environment are adequately protected from the hazards of DOE activities. For most DOE facilities, DOE assumes direct regulatory and enforcement authority for safety and health in accordance with the Atomic Energy Act of 1954, as amended. Safety policy, standards, and guidance must therefore take into account the nuclear, chemical, and industrial hazards posed by DOE operations and must be current with worldwide technologies, knowledge and experience. Environmental programs at DOE sites are, for the most part, driven by Federal, State, and local regulations. However, environmental direction and assistance are provided to DOE sites, especially in the areas of pollution prevention and Environmental Man-

agement Systems development and implementation. The fiscal year 2008 budget request provides for HSS to:

- Strengthen implementation of 10 CFR 851, Worker Safety and Health Program
- Continue to support training for Nuclear Executive Leadership, Senior Technical Safety Managers, and Environment, Safety and Health Project Managers
- Strengthen worker health and safety, nuclear safety, radiation protection, and environmental policies and standards, including Integrated Safety Management and Environmental Management Systems
- Continue implementation of the Federal Employee Occupational Safety and Health program via training, guidance, and other communications methods
- Strengthen liaison with the Institute of Nuclear Power Operations and the commercial nuclear power industry
- Provide support to the U.S. and international regulatory community by maintaining standards associated with the release of contaminated property and response to events involving radiological dispersal and improvised nuclear devices
- Continue to assist DOE sites to implement Environmental Management Systems and the DOE Environmental Compliance Management Improvement Plan
- Continue implementation of the Human Performance Improvement Initiative to identify and close human performance gaps
- Develop and issue the DOE Annual Site Environmental and National Environmental Standards for Hazardous Air Pollutants Reports
- Conduct and support cultural resource and environmental protection program workshops, lessons-learned programs and guidance and tools, including those related to implementation of environmental management systems requirements under the new Executive Order 13423 (Strengthening Federal Environmental, Energy, and Transportation Management) as well as those for continued compliance with environmental laws

DOE-Wide Environment, Safety, and Health Programs ($3,976,000)

DOE-Wide Environment, Safety, and Health Programs improve worker and nuclear facility safety, and protect the public and the environment. Activities under these programs develop state-of-the-art analysis tools and approaches specific to the nature and mix of radioactive, hazardous, and toxic materials at DOE facilities. Efforts include construction safety; work planning activities and techniques to identify, evaluate, and eliminate hazards; methods for reducing or eliminating release of pollutants; and the identification of technologies and innovative adaptations of existing practices. The fiscal year 2008 budget request provides for HSS to:

- Continue providing assurance that worker radiation exposures are accurately determined through the DOE Laboratory Accreditation Program
- Prepare the Annual DOE Occupational Radiation Exposure Report
- Continue to promote pollution prevention through DOE Pollution Prevention (P2) Star Awards and improve pollution prevention data reporting and analysis
- Assist sites in maintaining safe operations throughout the life-cycle of their nuclear facilities
- Strengthen and expand the implementation of the DOE Voluntary Protection Program (VPP), including continued development of the electronic VPP
- Assist in the implementation of Environmental Management Systems and provide Status Report to the U.S. Environmental Protection Agency
- Strengthen the implementation of the Enforcement Program Plan to integrate enforcement protocols for both nuclear and worker safety and health
- Improve the Noncompliance Tracking System to strengthen report generation and address feedback received from end users
- Continue the enforcement of 10 CFR 851, Worker Safety and Health Program
- Update 10 CFR 850, Chronic Beryllium Disease Prevention Program to reflect lessons learned and advances in technology since its promulgation in 1999

Corporate Safety Programs ($7,111,000 less $990,000 from prior year balance for a fiscal year 2008 request of $6,121,000)

Corporate Safety Programs serve a crosscutting safety function for the Department and its stakeholders in assuring excellence and continuous improvement in en-

vironment, safety and health in the conduct of its missions and activities. Elements that comprise Corporate Safety Programs include: Performance Assessment, the Quality Assurance Program (which includes the Corrective Action Management Program), Filter Test Facility, the Facility Safety Program (which includes Accident Investigations and Corporate Safety Basis), Price-Anderson Enforcement, and the Analytical Services Program. The fiscal year 2008 budget request provides for HSS to:

- Strengthen trending and analysis of DOE's safety performance in protecting the public, workers, and the environment through advanced analytical tools
- Analyze the effectiveness of site suspect or counterfeit items programs and prepare the DOE Annual Suspect or Counterfeit Items Activities Report
- Continue to improve the safety-related DOE Quality Assurance Program through updated directives, assessments, technical assistance, and maintenance of the Corrective Action Management Program
- Operate and maintain the High Efficiency Particulate Air Filter Test Facility
- Support and conduct Type A investigations for serious incidents and oversee the conduct of Type B investigations via the Accident Investigation Program
- Participate in Operational Readiness Reviews and Readiness Assessments, and associated program training, at Category 1, 2, and 3 nuclear facilities prior to the startup or restart of those facilities
- Continue implementation of the Nuclear Safety Enforcement Program in accordance with the Price-Anderson Amendments Act
- Implement the Analytical Services Program by developing corporate-level environmental sampling protocols and conducting quality assurance audits of environmental laboratories used by the sites in support of environmental compliance programs

Health Programs ($40,803,000)

Health Programs support domestic and international health studies including the Former Worker Program (a nationwide program of medical screening to identify work related health effects) and studies to investigate and identify work related injury and illness in the DOE worker population and populations surrounding DOE sites. The benefits of these projects and programs include discovery and documenting health effects outcomes that provide the scientific basis for national and international worker protection policy and standards. These radiation protection standards and practices, in turn, provide levels of protection appropriate for the risk posed to workers by hazards present at DOE sites. The fiscal year 2008 budget request provides for HSS to:

- Continue to conduct international health and environmental monitoring programs associated with:
  - the atomic blasts above Japan—Radiation Effects Research Foundation
  - resettling atolls in the Marshall Islands affected by the U.S. thermonuclear "Bravo" test
  - the accidental dispersal of radioactive materials in Palomares, Spain
  - nuclear weapons production activities in Russia
- Continue to implement the Former Worker Medical Surveillance Program by conducting medical screening to determine potential health issues (which screening has been done for over 46,000 individuals to date and will continue)
- Provide rapid medical expertise, response, and physician training in response to accidental exposure to radiation via the Radiation Emergency Accident Center and Training Site
- Collect and analyze medical and industrial hygiene data on current workers exposed to beryllium, plutonium, and other hazards
- Continue to conduct studies to determine the effect of DOE operations on surrounding populations and communities

Employee Compensation Program ($3,000,000)

This activity funds DOE's efforts in support of the implementation of the Department of Labor (DOL) Energy Employees Occupational Illness Compensation Program Act. DOE assists DOL, the National Institute of Occupational Safety and Health (NIOSH), and the Advisory Board on Radiation and Worker Health by providing access to all available records and information needed to support claims filed by DOE contractor employees and to enable DOL to fulfill its statutory responsibilities. The fiscal year 2008 budget request provides for HSS to:

- Provide DOL, the NIOSH, and the Advisory Board on Radiation and Worker Health, access to all available records and information needed to support such claims in a timely manner
- Maintain improved communication and coordination with DOL and NIOSH through weekly conference calls and periodic meetings with Advisory Board on Radiation and Worker Health
- Work with line management to identify field contacts to improve program implementation

Safety and Security Training ($14,756,000)

Funding develops and maintains the proficiency and competence of DOE safety and security personnel through standardized training, education, and professional development services. Funding also provides for the conduct of workforce analyses and career development programs required for the protection of the environment, safety, and health of the public, the Departmental workforce, and critical assets and national security. The DOE National Training Center, in Albuquerque, NM, is the designated DOE Center of Excellence for safety and security training and the primary resource for performing these functions. The fiscal year 2008 budget request provides for HSS to:

- Conduct the Leadership Development Institute courses
- Host the semi-annual Federal Technical Capabilities Panel
- Increase focus on safety and security training interface, based on the safety and security expertise within HSS
- Increase utilization of the Integrated Safety and Security Training and Evaluation Complex
- Enhance Tactical Response Force Course by providing performance oriented training
- Conduct safety and security training needs assessment surveys to identify training requirements for new security and/or safety technologies

Security Operational Support ($14,345,000)

Security Operational Support activities provide technical expertise to support the implementation of Department-wide security requirements. The fiscal year 2008 budget request provides for HSS to:

- Continue evaluation of the Design Basis Threat (DBT) Policy and Security Directives (Policy) Zero Base-line Review
- Enhance rules of engagement in support of force-on-force performance exercises and for response to security events
- Continue implementation of the Elite Protective Force Initiative (the Department believes that the current contractor security force model is working well. There are certainly pros and cons to the Federalization question, but the Department has reviewed this option and concluded that the contractor model, coupled with our Elite Protective Force Initiative, provides the security posture that we expect in protecting our facilities and assets)
- Maintain the Human Reliability Program and continue implementation of Personnel Security Program Review recommendations
- Continue support for sharing methods and products to satisfy regulatory security requirements through the Security Awareness Special Interest Group
- Maintain security related data systems, e.g., Safeguards and Security Information Management System, Incident Tracking and Analysis Capability
- Provide risk management, vulnerability assessment, and security system performance evaluations, verifications, and validations for identification and clarification of threats to departmental assets
- Continue support for the Foreign Ownership, Control or Influence and Foreign Visits and Assignments programs and associated data management systems
- Maintain the Nuclear Materials Management and Safeguards System (NMMSS) and other nuclear and radiological material tracking programs in support of international treaties and Nuclear Regulatory Commission initiatives

Headquarters Security Operations ($24,942,000)

Headquarters Security Operations supports the security protective force and systems designed to provide protection of DOE Headquarters facilities and assets. The fiscal year 2008 budget request provides for HSS to:

- Maintain physical protection and access control for DOE operations in the National Capital Area (Washington, DC, and Germantown, MD)

- Manage the Technical Surveillance Countermeasures (TSCM) Program for DOE Headquarters and contractors in the Greater Washington, DC, area
- Maintain security alarms and access control systems
- Conduct security briefings for DOE Federal and contractor employees; other personnel granted DOE access authorizations, and non-DOE personnel granted unescorted access to DOE Headquarters facilities

Security Technology Development and Systems Deployment ($15,840,000)

The Security Technology Development and Systems Deployment activity provides technology-based solutions to known security vulnerabilities throughout the DOE complex as an alternative to costly increases in manpower needed to implement the DBT Policy, and provides technologies to counter threats for which no current defensive capability exists. The activity identifies and evaluates commercial technologies to ensure that system performance is commensurate with operational security requirements before such technologies are purchased and deployed to protect critical national security assets. Funding also provides for the modification of existing technologies, deployment of technologies, and technical assistance to meet security requirements in the most cost-effective manner possible.

Classification, Declassification, and Controlled Information ($11,678,000)

This activity ensures that the Department meets its statutory responsibility to implement the U.S. Government-wide program to classify and declassify nuclear weapons-related technology (i.e., Restricted Data and Formerly Restricted Data), and to implement the requirements of Executive Order 12958 to classify other information that is critical to the national security (i.e., National Security Information). This program identifies information controlled under statute to protect national security (i.e., Unclassified Controlled Nuclear Information) and other governmental, commercial, and private interests (e.g., Official Use Only). This activity also provides for the training and certification of DOE and other U.S. government Department and Agency personnel.

Security Investigations ($37,836,000)

This activity manages funding for background investigations to provide access authorizations to DOE Federal and contract personnel who, in the performance of their official duties, require access to classified information or certain quantities of special nuclear material. Background investigations are required by section 145 of the Atomic Energy Act of 1954, as amended, and EO 12968 (Access to Classified Information). The investigations are performed and access authorizations granted based on 10 CFR Part 710, Criteria and Procedures for Determining Eligibility for Access to Classified Matter or Special Nuclear Material. The centralized management of access authorizations and related data is performed in a cost-effective, efficient manner using electronic databases and Internet-capable tools that comprise the electronic DOE Integrated Security System (eDISS+). These electronic tools support and track the adjudication process from the beginning to the disposition of the access authorization request. Either the Federal Bureau of Investigation or the Office of Personnel Management performs the background investigations as required by law or DOE requirements.

Program Direction ($100,043,000)

Program Direction provides the salaries, benefits, travel, working capital fund and other related expenses for the 437 Federal employees as well as other resources and associated costs required to provide overall direction and execution of HSS programs. It provides for implementation of the Independent Oversight program of evaluating the Department's performance in safeguards and security; cybersecurity; emergency management; environment, safety and health; and any other subject areas as dictated by the Secretary and Deputy Secretary and support to the Departmental Representative to the Defense Nuclear Facilities Safety Board.

Specialized Security Activities ($150,815,000)

Funding is provided to identify and communicate information necessary to ensure adequate protection of the Department's national security assets.

HSS PRIORITIES FOR FISCAL YEAR 2008

As the Chief, HSS Officer, I am constantly aware of the vital role and significant responsibilities HSS has to ensure the HSS functions of this department are strengthened. To meet this commitment, one of our major priorities is to institu-

tionalize our activities. Additionally, other key HSS priorities for fiscal year 2008 to ensure we meet our commitment are to:

- Improve the quality and timeliness of safety and security policy and directives
- Enhance worker health and safety based on priorities developed from operating experience, health studies and surveillance data, independent oversight results, enforcement activities, and other stakeholder feedback
- Enhance Federal expertise in the area of line management oversight of field operations and the effective application of resources
- Improve issues management to provide a foundation for continuous improvement and preventing recurrences of adverse events
- Improve interface with the DNFSB
- Improve the worker health, safety, and security interface
- Implement the Elite Protective Force
- Increase Emphasis on Security Technology Deployment
- Continue and Enhance Independent Oversight

CONCLUDING REMARKS

Mr. Chairman and members of the subcommittee, the Secretary of Energy created HSS to strengthen worker health, safety, environment, and security functions within the Department. Since its creation, HSS has received strong and continual support from the Secretary, the Deputy Secretary, and the Department's leadership. In the past 6 months, we have made significant strides towards improving the health, safety, environment, and security functions of the Department, including better alignment of responsibilities associated with these functions. We are confident that with the continued support of DOE management, our stakeholders, and Congress, we can expand on the accomplishments of the past 6 months and further strengthen the Department's health, safety, environment, and security functions. This strengthening will better ensure that all DOE workers, the public, and our national security assets are safe and protected.

HSS Accomplishments

October 2006 – March 2007

The First 180 Days

During the first six months following the establishment of HSS, HSS has worked to place the proper people with the necessary skills and expertise in the proper functions in the new organization. HSS has also focused on ensuring that we effectively apply the resources Congress has provided to best serve DOE workers and the American people and to better secure our national assets. We have made a good start, and with support of the President's FY 2008 Budget, we will be able to build upon that foundation. In support of the HSS FY 2008 budget request, recent HSS activities include:

Site visits by HSS senior management to over 21 locations and organizations, as well as meetings with Headquarters program offices during the first four months: HSS senior management conducted visits around the DOE complex to meet with program office, site office, and contractor management and union representatives, as well as external organizations, to provide information on the creation of HSS and its roles and organization, and to obtain feedback on issues related to health, safety, environment and security. Meetings were held with the: Idaho Operations Office (ID), Hanford, the Office of River Protection (ORP), Pacific Northwest National Laboratory (PNNL), Pantex, Site, the NNSA Service Center, Sandia National Laboratories (SNL), the Office of Secure Transportation (OST), Nevada Test Site (NTS), the Y 12 National Security Complex (Y-12), Yucca Mountain, Oak Ridge National Laboratory

(ORNL), the Oak Ridge Office (OR), Kansas City Plant (KCP), the Hazardous Materials Management and Emergency Response (HAMMER) Training Center, Lawrence Livermore National Laboratory (LLNL), Stanford Linear Accelerator Center (SLAC), Lawrence Berkeley National Laboratory (LBNL), Savannah River Site (SRS), Los Alamos National Laboratory (LANL), Brookhaven National Laboratory (BNL), the Director of the National Institute for Occupational Safety and Health (NIOSH) and the Associate Director for Mining, NIOSH, as well as the Government Accountability Project (GAP), the Project on Government Oversight (POGO), and the Building Trades Commission of the AFL-CIO. These initial visits/meetings have resulted in an ongoing dialogue between HSS, the field, and external stakeholders to enhance policy development, provide site assistance, and facilitate the resolution of a number of health, safety, environment and security issues.

Benchmarking meetings: HSS senior management conducted meetings with organizations and agencies that are responsible for high-risk activities similar to those at DOE. As part of an overall effort to analyze and improve the Department's current safety management programs, HSS conducted meetings to gain insight into how the private sector or other government agencies measure, manage and improve safety. HSS held meetings with the U.S. Air Force (USAF) Assistant Secretary for Environment, Safety and Health; DuPont safety executives; the National Security Agency; and the Naval Safety Center. The visit to the Naval Safety Center included an HSS demonstration of the DOE Occurrence Reporting and Processing System (ORPS), the DOE Computerized Accident and Injury Reporting System (CAIRS), and the DOE Lessons Learned Database. HSS conducted follow-up meetings with Air Force staff, at their request, to assist in their efforts to achieve safety excellence. Follow-up discussions focused on

developing safety excellence models, developing performance expectations for safety for DOE Federal and contractors, and integrated safety management (ISM).

Communicating/Interfacing with the Institute of Nuclear Power Operations (INPO): HSS met with INPO in January to discuss their technical assistance process and application in the commercial nuclear industry and at DOE. HSS is planning follow-up discussions to discuss how to best utilize INPO's technical assistance capabilities to foster improvements at DOE.

Improving Defense Nuclear Facilities Safety Board (DNFSB) Interface and Cooperation: HSS is working to improve DOE interface with the DNFSB by increasing HSS communication with the Board. Improved coordination is continuing to address safety in design and construction, nuclear risk assessment policy, nuclear material packaging, and quality assurance program efforts throughout the Department.

Revision of Regulatory Language: Rules referencing the former Assistant Secretary, EH, were amended. A Federal Register Notice was published on November 28, 2006, amending various regulations to transfer the applicable health, safety, environment and security functions to HSS that previously were carried out by EH and SSA.

Health, Safety and Security Managers Focus Group: HSS formed the integrated Health, Safety and Security Managers Focus Group composed of senior HSS managers to solicit, discuss, and address topics and issues of interest to DOE managers and stakeholders. HSS conducted the first monthly Focus Group meeting on February 12 with the Acting Administrator,

NNSA, and senior NNSA safety and security managers and a second meeting on February 26 with the Under Secretary for Science and senior Office of Science (SC) managers and a third meeting on March 27 with the Yucca Mountain Program. Meetings are being scheduled with other program offices and invitations for participation are being extended to union representatives and interested stakeholders.

Develop and Implement a Policy on Differing Professional Opinion (DPO): HSS finalized DOE P 442.1, *Differing Professional Opinions on Technical Issues Related to Environment, Safety and Health*, to facilitate dialogue and resolution on DPOs related to environment, safety, and health aspects of DOE facilities and activities. This Policy provides a process for technical issues to be resolved when there is disagreement with line management. The process requires the employee to identify the issue and its basis and to give that information to the DPO manager within HSS or NNSA. Implementation of the DPO process also includes educating DOE managers and employees on the program.

10 CFR Part 851, Worker Safety and Health Program: Implementation of this program has re-invigorated the Departments focus on workers as a valuable asset and is being facilitated through assistance and outreach by:

- Conducting monthly conference calls and office-to-office contact with DOE Federal and contractor staff to assist in the development, review, and approval by site management of contractor worker safety and health programs,
- Issuing DOE Guide 440.1-8, *Implementation Guide for use with 10 CFR 851 Worker Safety and Health Program*, on December 27, 2006, to provide supplemental information and

describe implementation practices to assist contractors in effectively developing, managing and implementing required worker safety and health programs,

- Maintaining a 10 CFR 851 web site as a comprehensive source of assistance for implementation of the Rule,
- Revising DOE Order 440.1, *Worker Protection Management for DOE Federal and Contractor Employees* currently in the DOE review and approval process, to remove contractor requirements contained in 10 CFR 851, and
- Developed an electronic web based variance process (now available on the 10 CFR 851 website) to ensure that HSS provides timely review of applications for variances and provides recommendations to the cognizant Under Secretary.

Injury and Illness Surveillance Program (IISP): The IISP is the only source of information about the health of the current contractor workforce. It covers 80,000 workers at 13 DOE sites. The program's goal is to monitor morbidity and assess the overall health of the workforce, identifying those groups that may be at risk of occupational illness or injury. The program provides a focus for intervention that can reduce or eliminate that risk. Surveillance data also provide a means to evaluate the effectiveness of that intervention.

Energy Employees Occupational Illness Compensation Program Act (EEOICPA): HSS has strengthened and enhanced the implementation of EEOICPA through:

- Working cooperatively with and assisting the Department of Labor (DOL) to process claims filed by DOE Federal and contractor employees by providing DOL, the National Institute for Occupational Safety and Health (NIOSH), and the Advisory Board on Radiation and Worker

Health access to all available records and information needed to support such claims in a timely manner;

- Maintaining improved communication and coordination with DOL/NIOSH through weekly conference calls and periodic meetings with the President's Advisory Board on Radiation and Worker Health;
- Working with line management to identify field points of contact to improve EEOICPA implementation;
- Increasing efforts to recover records that may assist workers / former workers in EEOICPA claims; and
- Supporting a DOL initiative to develop a site exposure matrix detailing the hazards and potential resulting illnesses for each DOE site to assist DOL adjudicate EEOICPA Part E claims.

Enhance Integrated Safety Management (ISM): The November 1, 2006 approval of the ISM Manual will provide clearer policy guidance and focused leadership. The Deputy Secretary designated the Director, Office of Health and Safety, HSS, as the DOE Champion for ISM to drive implementation throughout the Department in coordination with the program and field offices. Vesting this level of responsibility within the policy office that is primarily responsible for worker safety is essential for improving ISM implementation across the DOE complex.

Safety and Security Interface: HSS is capitalizing on the synergy implicit in its creation to improve the policy interface between the security measures needed to counter the threats to Departmental security assets and the safety measures necessary to protect the health and safety of

DOE workers and the public and to protect the environment. This effort is currently focused on resolving the safety and security issues that have arisen with the implementation of enhanced security measures needed to respond to modifications to the Department's Design Basis Threat (DBT). In addition:

- HSS is providing technical assistance to integrate safety and security design considerations early in the construction process. DOE O 413.3A, *Program and Project Management for the Acquisition of Capital Assets*, was revised to incorporate security. This directive has historically focused on the incorporation of safety into capital asset construction planning and renovation projects. The addition of security language will allow for clearer integration of security and safety functions in field project planning and design. HSS is now participating on crosscutting Departmental teams to develop DOE functional guides to accompany the recently revised directive.
- HSS is providing assistance to resolve issues in security training implementation, with the goal of identifying potential conflicts between safety performance goals being established for protective forces and effective training methods.
- Through participation in the Government Electronics & Information Technology Association Safety System Committee, HSS is working to improve the integration of environment, safety, and health considerations into the process for conceiving, producing, deploying, and supporting weapons systems.

Crosscutting Issues: HSS is working to identify and prioritize crosscutting worker safety and health issues, which HSS will use to provide assistance to program and field elements. HSS is also working to develop a DOE-wide process for identifying and addressing crosscutting issues,

e.g., worker safety aspects of protective force activities especially in light of elite force implementation and safety aspects of deployed security technologies.

Strengthen the rigor of the Voluntary Protection Program (VPP): HSS has promoted a renewed awareness of the significance of this program by the Deputy Secretary and other senior managers. HSS is revising processes and procedures to emphasize performance-based evaluations and plans to incorporate the VPP program into the DOE Directives System to strengthen the program's rigor and formality. To involve a larger portion of the DOE contractor workforce, HSS is working to expand the positive impact of the VPP program through senior management involvement, application of various incentives, and outreach through national VPP organizations and meetings.

Pandemic Influenza Preparedness Planning: HSS is providing coordination and support to the Department, through education and awareness training and close coordination with NNSA, to ensure that pandemic response is incorporated in the DOE COOP plan and program office and field COOP implementation plans. HSS has established the Biological Effects Monitoring Team (BEMT) to coordinate Department-level planning and response. HSS is coordinating with the Site Occupational Medical Directors to assist in their pandemic preparedness planning.

Former Workers' Records: Data will be maintained from a 1981 Naval Shipyard Study (Naval Reactors project) conducted by Johns Hopkins Bloomberg School of Public Health (JHSPH).

International Health Studies: HSS is strengthening the relationships with the applicable governments as well as the conduct of the international health and environmental monitoring programs associated with the Radiation Effects Research Foundation; Marshall Islands; Palomares, Spain; and Russia.

Integration of Safety into the Design Process: HSS is working with NNSA, EM, and the DOE Central Technical Authorities to develop safety design criteria for seismic design and co-located worker safety-significant structures, systems, and components that involve radiological thresholds. As with security issues discuss earlier, HSS is also providing assistance to ensure seamless integration of safety into DOE O 413.3A, *Program and Project Management for the Acquisition of Capital Assets*, by coordinating the development of a new DOE Standard, DOE STD-1189, with those developing DOE O 413.3A guidance.

Maintenance Management Program for DOE Nuclear Facilities: HSS is leading and coordinating a DOE Working Group to address crosscutting implementation issues associated with DOE O 433.1, *Maintenance Management Program for DOE Nuclear Facilities*. On February 13, the Working Group addressed a series of crosscutting implementation issues. The subgroups have revised their charters to address funding needs, data collection time, time period for data analysis, and formulation of recommendations.

Operational Readiness Review (ORR) Program: HSS is working with DOE elements to develop needed changes to the DOE ORR Order (DOE O 425.1C, *Startup and Restart of Nuclear Facilities*), guidance, and training curriculum, as well as to identify processes for the

sharing of effective ORR-related practices, with the goal of creating continuous improvement in the DOE ORR and Readiness Assurance processes.

Environmental Management System (EMS) Implementation Status Annual Reporting: The report, incorporating analysis and a summary of comments provided by sites, was submitted to the Environmental Protection Agency (EPA) on February 2 by the Chief Health, Safety and Security Officer, as DOE's Agency Environmental Executive.

DOE 2007 Pollution Prevention (P2) Awards Program: As DOE's Agency Environmental Executive, HS-1 nominated the Department's Best-in-Class selections as the Department's entries to the White House Closing-the-Circle competition based on the Department's Best-in-Class nominees. The Best-in-Class selections will also serve as entries for the DOE *P2 Star* awards that HS-1 will present in recognition of exemplary achievements in pollution prevention during the Earth Day 2007 celebration in April.

Pollution Prevention Data Reporting and Analysis: HSS developed a summary of its preliminary findings based on its evaluation of pollution prevention and environmentally preferable purchasing data submitted by DOE program and field elements. These findings, as well as other findings from the review of this P2 data, will be used to identify opportunities for providing technical assistance to improve site- and program-specific performance in the pollution prevent area.

Integration of Enforcement Activities: The HSS Office of Enforcement has integrated nuclear

safety (Price-Anderson Amendments Act, [PAAA] Part 820); security (Part 824); and worker safety and health (Part 851) enforcement programs to provide a consistent and proven approach for conducting enforcement activities. The Office is working on enforcement and successive implementation of 10 CFR Part 851, the worker safety and health rule. Key initiatives include frequent workshops, conferences, and teleconferences that engage policy, implementation and enforcement issues. In addition, HSS is conducting the first Part 824 security enforcement investigation of the facts and circumstances that resulted in the recent LANL security incident.

Corporate Safety Performance Indicators: HSS is focusing on solving systemic causes of deficient performance to reduce and prevent events by examining leading as well as lagging performance indicators. HSS has developed a Corporate Safety Indicator "dashboard" to provide senior management with the status and trends of DOE safety performance that can be utilized as an effective tool to focus, on a monthly basis, senior management dialogue and attention on areas of safety and health priority.

DOE Operating Experience Program Council: HSS is expanding the DOE Operating Experience Program, to include all DOE Federal and Contractor Operating Experience Program Coordinators, to communicate operating experience and lessons learned across the Department more effectively. An Operating Experience Council made up of DOE Federal and DOE contractor managers, as well as, managers from "Best in Class" industries, will help ensure the use of valuable lessons learned from within, and outside of the Department.

National Training Center (NTC): HSS is acting to enhance and integrate safety and security training throughout the Department. Efforts to date include:

- Conducting the fourth Leadership Development Institute course in March 2007;
- Hosting the semi-annual Federal Technical Capabilities Panel meeting in December 2006;
- Increasing focus on safety and security training interface based on the safety and security expertise within HSS;
- Conducting a new Senior Technical Safety Manager (STSM) Overview course in February 2007, consisting of lecture, discussion, activities, and sample exams with questions similar to those presented on the actual STSM qualification exam;
- Dedicating the Integrated Safety and Security Training and Evaluation Complex (ISSTEC) in December 2006;
- Developing a new Tactical Response Force Course to provide enhanced performance-oriented training that includes an additional two weeks of tactical operations and weapons skills;
- Conducting the first new ten-week Tactical Response Force Course, completed on March 16, 2007, at the ISSTEC;
- Conducting Tactical Leadership Course at the ISSTEC for protective force supervisory personnel from across the DOE complex to enhance their leadership skills in responding to potential threats against DOE resources; and
- Conducting a safety and security training needs assessment survey to identify training requirements for new security and/or safety technologies.

Enhancement of Management Systems Supporting Employee Assistance: The Employee Assistance Task Force, led by HSS, was established to review and assess incidents that raise issues associated with employee concerns. HSS is developing a plan to implement recommendations resulting from this special review, DOE has also benchmarked, discussed, and compared such issues of workplace/workforce reliability, against with the chemical/petrol sector, the military, defense contractors and the National Security Agency.

Independent Oversight: To increase DOE's health, safety, and security posture, HSS has a rigorous performance-based independent oversight program that assesses safeguards and security; cyber security; emergency management; and environment, safety and health programs across the Department. Independent oversight inspections focus on many areas, including contractor self-assessments, DOE line management evaluations, and worker performance in order to continuously evaluate DOE's safety and security posture. HSS has a strong capability to identify weaknesses in safety and security programs and program implementation through mechanisms such as program reviews, limited-scope performance testing, and large-scale force-on-force exercises. The effectiveness and value of HSS's assessments enable DOE sites to take timely corrective actions, or when necessary, immediate compensatory action to address any weakness.

FY 2007 Independent Oversight Inspections conducted to date include:

- Combined Security and Cyber Security Inspection at the Strategic Petroleum Reserve;
- LANL Combined Safeguards and Security, Cyber Security and Emergency Management Inspection;

- NNSA-SC Personnel Security Follow-Up Review;
- Classification and Information Control Inspection of Oak Ridge Operations Office (OR), ORNL, and East Tennessee Technology Park (ETTP);
- Continuing unannounced Cyber Security Penetration Testing of selected DOE/NNSA sites;
- Cyber security site assistance visits;
- NTS Combined ES&H and Emergency Management Inspection;
- OST Emergency Management Inspection;
- SLAC ES&H Inspection;
- LLNL ES&H Inspection; and
- Technical Surveillance Countermeasures (TSCM) Special Review.

Personnel Security Program Review: The Chief Health, Safety and Security Officer served as the chairman of the task force, composed of staff from HSS, the Under Secretary of Energy, Under Secretary for Science, and Under Secretary for Nuclear Security (Administrator, NNSA). This task force examined the Department's personnel security policies and procedures, quality assurance and line oversight, training, and organizational structure for access authorizations and provided the Secretary of Energy with their results and recommendations.

Enhance security policy in coordination with efforts to revitalize health and safety policy: HSS has begun a complete review of security policy to include identifying current security requirements, identifying those that respond to requirements levied upon the Department from external sources, identifying the protection need that each requirement under review was intended to meet, and assessing the effectiveness of the current requirement in meeting that need.

HSS, in coordination with the DOE program and site offices, will create a revised set of requirements that is more performance-based, is presented in a way that increases the utility of the directive, and that is significantly more concise than the current directives set.

Design Basis Threat (DBT) Annual Review: HSS coordinated and led the 2006 review of the DBT policy.

INL Zero-Baseline Review of Security Protection Measures: HSS conducted a review (referred to as a "Super Site Assistance Visit") to demonstrate that the deployment of security technologies, complemented with modifications to protective force tactics, can help sites meet the DBT Policy requirements in a cost-effective manner.

Revised Vulnerability Assessment (VA) Methodology: The results of the INL Super Site Assistance Visit, and subsequent validation activities and process review, led to the development of a draft VA methodology that more closely reflects a representative risk assessment metric than the current worst-case VA methodology.

Security Technology Deployment: HSS has proceeded with a multi-faceted approach to deploy security technologies at DOE and NNSA facilities to improve the effectiveness of their protection systems while minimizing recurring costs and impacts to site operations and ensuring the safe operation of the new technologies. HSS has established agreements with several sites to deploy specific technologies in 2007. HSS has also worked extensively with these sites and various vendors, other government agencies, and testing laboratories to select, procure, and

deploy technologies that represent the best possible investment for the Department to protect critical assets and that adhere to safety principles.

Performance Test and Analysis: Performance Test and Analysis Center activities focus on enhancing overall security performance testing effectiveness throughout the complex. Force-on-Force Performance Testing Protocols and Rules of Engagement were developed, extensively field tested, and recently approved by senior management for distribution and implementation. At the request of certain field elements, HSS has reviewed protection strategies to facilitate the deployment of new security technologies; reviewed critical pathways identified by VAs; developed adversary scenarios to use for their performance testing program; and observed force-on-force performance testing exercises to assist the field element enhance their protection strategies.

ANSI Voluntary Consensus Standards: In December 2006, the ANSI N-15 Committee, *Methods of Nuclear Material Control,* was re-accredited under the American National Standards Institute (ANSI), along with the Institute of Nuclear Materials Management (INMM) as Secretariat. This is a major milestone under ANSI. Re-accreditation lays the foundation for current and future development of ANSI voluntary technical standards relating to nuclear material control, including physical protection and associated safety impacts. HSS staff members participate and hold Board positions on the ANSI N-15 Committee. The ANSI writing groups and subcommittees provide a means for continued collaborative work between DOE, the Nuclear Regulatory Commission (NRC), government and commercial entities, and the international community on many different issues related to nuclear material control.

Radiation Source Protection and Security Task Force: HSS participates on the task force established under the Energy Policy Act of 2005, and led by the NRC, to 1) evaluate radiation source protection and security in the United States, and 2) provide recommendations for appropriate regulatory and legislative changes relating to the security of radiation sources.

Classification and Declassification Training, Technical Guidance and Document Reviews: Recent HSS efforts include:

- Completion of review of DOE historic records slated for declassification by December 31, 2006, under EO 12958.
- Review of previously released records at the National Archives in order to recover and report inadvertent releases of Restricted Data and Formerly Restricted Data as required under Public Laws 105-261 and 106-65. This effort is near completion with a 25th report to Congress anticipated in May of this year.
- Review of Other Agency Records referred to DOE and Quality Control Reviews of Other Agency Records for identification of Restricted Data and Formerly Restricted Data records as required under Public Laws 105-261 and 106-65. These efforts are ongoing and anticipated through at least calendar year 2009.
- Courses for Historical Records Restricted Data Reviews for various government agencies to assist them identify potential Restricted Data and Formerly Restricted Data information in their documents and prevent the inadvertent release of sensitive nuclear technologies.

- Additional resources dedicated to reviews of classified documents requested under the Freedom of Information Act (FOIA) and the mandatory provisions of EO 12958 for various DOE elements and other government agencies.

Senator BILL NELSON. The protective force at the Pantex plant had a strike a couple of weeks ago. With one exception, the security forces that protect those weapons and materials are all contractors. So the issue that was raised at Pantex is a recruitment and retention issue, the ability to meet their physical and training require-

ments. It's pretty much age-dependent. So tell us, what do you think we ought to do about this as the security force ages?

Mr. PODONSKY. First I will clarify. None of the protective forces, contractors or the small group that are Federalized out of the Office of Secure Transportation, are part of our program, but they are supposed to follow our policies and we do inspect them.

The strike at Pantex is extremely unfortunate. But the issue of Federalization—and you are correct, the entire guard force all across the complex are contract, either proprietary contract or subcontract, with the exception of the Office of Secure Transportation folks. In order to understand the full issue, if you will indulge me, Mr. Chairman, let me explain what former Secretary Spence Abraham wanted us to do in 2003. He wanted to set forth some initiatives in a post-September 11 environment to strengthen the posture of security throughout the Department.

So, one of those 14 initiatives was looking at an option of whether Federalization of the Guard force would make it a more effective force. What we did with the former Administrator Linton Brooks and myself and other parts of the Department, we constituted a protective force working group. What that working group did, for about 6 months, they examined all the options and they concluded that the contract force model combined with an Elite Force Initiative, which I will explain in a moment, would provide the protection strategies that we need at some of our most sensitive facilities.

But the concept of Federalization in some sectors became something of a misnomer as to what that meant. What we discovered and what former Administrator Linton Brooks and myself said in correspondence to then-Deputy Secretary Kyle McSlarrow—was that, while that might prove to be an option that is favorable down the road, for the expedience of getting the safeguards security posture to the level that we need in the post-September 11 environment, we really need something quicker and more definitive.

The working group discovered that the contract model together with the elite force concept was the best way to go.

But the issue of taking care of our security forces, taking care of our first responders, is still very much there. Within the training requirements, which have been there since the 1980s, we have various levels of expectations for the security officers and we have built into the requirements that if they are injured on the job or if they are getting older, like Mr. Rispoli and myself, and cannot perform any more, then there is a place for us to retreat to within the Guard force.

What we think needs to happen—and I have talked to the acting Administrator, Bill Ostendorf, as recent as this morning—is we think that not only down at Pantex, but our entire security forces, need to be dealt with in a fashion that they feel like they are being taken care of. They are putting their lives on the line and we do think that the policies are there to help them. But, I think it would be helpful for us to examine further what else the Department can do in that regard, because there may be retreat capabilities back into corporations that they are working for or other solutions.

Senator BILL NELSON. Well, you were recently at Pantex. What is your assessment of their capabilities?

Mr. PODONSKY. We were asked by the Secretary and the acting Administrator to send an independent group down and they went down last week. To the credit of the Pantex site office, they did an extremely outstanding job standing up a contingency force. Our folks, 10 days into the strike, felt that the security forces were providing competent security at the levels that we would expect.

Our biggest concern, Mr. Chairman and Senator Sessions, is the sustainability. With the number of hours that the security officers are working, with the amount of time that they are going to put in, not knowing when the strike might be over, we are concerned about the level of security over the long haul.

So at the 10-, 11-, 12-day period when my inspectors were down there, I have every confidence to tell you that nuclear material is protected. But beyond that, we become very concerned, and we have expressed this to the acting Administrator and we have expressed this to the Secretary.

Senator BILL NELSON. This temporary protective force that was assembled was pulled from other areas. What is the effect on the other sites and transportation requirements?

Mr. PODONSKY. We have not gone out to assess it. But in talking to the safeguards and security directors at those sites, for the short haul, which they consider is the 30-day period, they do not feel that their safeguards security posture will be adversely affected. But we, from an independent standpoint, again feel the sustainability is going to be the question.

So it is not just going to be the Pantex safeguards and security posture that we are going to be concerned about, but it is going to be these other sites, Mr. Chairman, as you point out, where they provided security officers who are working extended hours. They are going to have to be rejuvenated when they go back to their own sites. So there is a long line of concerns that exist with every passing day.

Senator BILL NELSON. Who is in charge of security at Pantex today?

Mr. PODONSKY. It is a guard force out of BWXT, which is the main contractor. Then they report to BWXT, and of course BWXT reports to the NNSA through their site office.

Senator BILL NELSON. Well, Federal forces cannot be under the authority and direction and control of contractors.

Mr. PODONSKY. That is correct.

Senator BILL NELSON. How have you avoided that here?

Mr. PODONSKY. What NNSA has avoided is that the Office of Secure Transportation, those couriers that went to help supplement the security forces, they are under the supervision of the Federal site office, is what I am told. So they avoided the Federal couriers being directly supervised by the contract guard force. It seems to be working, but that also is an awkward way to operate.

Senator BILL NELSON. You jump in at any point here.

I will conclude this part. What about these other protective force contracts as they are coming up for negotiation? Are we anticipating any strikes there?

Mr. PODONSKY. Mr. Rispoli, for example, at Savannah River has a protective force contract that is coming up. It is my understanding, using his site as an example, is that they have agreed to

hold off on the renewal of the contract, and we believe that this is going to be the theme throughout the complex. People are watching to see what the results are out at Pantex.

So there is no doubt, Mr. Chairman that the reverberation is going to be more than just Pantex.

Senator BILL NELSON. Do you think that DOE could manage a temporary protective force at more than one site?

Mr. PODONSKY. I am not a labor law expert, but I do believe that from a standpoint of how many security officer strikes we can handle. I think we are going to be stretched just with the one that we are working on now.

Senator BILL NELSON. Then the next question that is begged is—when does work slow down or stop as a result of the security concerns?

Mr. PODONSKY. Well, we plan to go back down to Pantex, for example. If they go beyond the 30 days, we plan to go back down to see what the effect is long term. Our recommendation may, in fact, be to the Administrator and to the Secretary that they may have to curtail operations.

Senator BILL NELSON. In the past, DOE has looked at management options for the protective forces. Do you know anything about those reviews in the past and could you summarize for the Committee the findings and the conclusions?

Mr. PODONSKY. There has been a number of studies over the last 20 years on security of the DOE. All of them resulted in what I would summarize from my personal and professional belief is that a concern in terms of the rigor in which security is being focused on by management.

Part of the organization that I manage, the predecessor that was created from Security Operations, which was policy, and the Office of Security and Safety Performance Assurance, which was oversight—former Secretary Abraham pulled those two offices together and we saw in the last 3 years quite an improvement in performance of security based on putting the policy and the overseers together so they were not at conflict and they could check out how effective the security forces were and how effective the policy was, because, quite honestly, Mr. Chairman, the security policies as well as the safety policies need to be reviewed so that they are better understood and the implementation can be made in a way that is not so costly.

One of the issues that Secretary Bodman saw, as I mentioned at the beginning of my opening statement, we also saw the problem with the safety. I would conclude it this way after a number of years in the Department. It is not rocket science. It is a matter of managing the resources and taking care of the people and making sure that they can take care of the mission.

Senator BILL NELSON. Well, let us know if you need any legislation on this whole matter of security.

Senator SESSIONS. Mr. Podonsky, as I understand it the striking employees are employees of a private contractor.

Mr. PODONSKY. Yes, sir.

Senator SESSIONS. The strike is to call on not the contractor, but the Federal Government, to make them Federal employees? Is that what the issue is?

Mr. PODONSKY. I have to be somewhat cautious since there are negotiations going on between the company and the union. As I understand it, there are a number of issues at play. One of the issues that seems to be a prevailing issue that has been written about in the newspapers and talked about in a number of sectors was this issue of Federalization. I think, Senator Sessions, when you were out I talked about Federalization.

But briefly, I will just tell you, we did in fact for former Secretary Spence Abraham do a special review of the option of Federalization, which was not the intent. Federalization was an option possibly to improve the posture of how we have our protective forces. What I mentioned to the chairman is that the committee that was both field experts as well as headquarters, both NNSA and the Department, concluded that the contractor model together with what we call an Elite Force Initiative provided us the posture of security that we needed throughout.

Senator SESSIONS. But is that not a basis for the strike? I just do not know.

Mr. PODONSKY. I believe, in my personal opinion, that it is an understanding by the security forces that Federalization might provide them job security, which they do not currently have. That is what their view is.

Senator SESSIONS. That is, I am sure, because it is hard to leave the Federal Government, except for us. We can be voted out like that.

Mr. PODONSKY. After this hearing, Senator, I might be out too.

Senator SESSIONS. Maybe not. Thank you.

Well I am sorry we have had that strike. I have been through those processes and had some that worked out where we privatized things like lawn care at military bases and other things have been privatized. Other things have not proven to be effective to privatize. So it is a matter worthy of consideration.

Mr. Rispoli, thank you for your testimony. You seem to be in command of the facts and figures of these issues and I respect that. For example, the $3 billion contingency fund that you hope not to spend, if the DOE does not spend it who gets that money?

Mr. RISPOLI. That $3 billion, of course, is spread out over the entire construction period for the project, which goes to 2019. So as we enter each year and we have that contingency amount set aside, if it is not spent then we would be required to come back to Congress under the current reprogramming rule if we wanted to move it anywhere else.

I will also mention to you that because of the significance of this project, Deputy Secretary Clay Sell has asked me to brief him once a month on this project. Part of that briefing will be a focus not only on the performance of the contractor, but also whether or not any of that contingency needs to be used in a month-by-month basis. So we are keeping a very close hold on the use of that contingency.

Senator SESSIONS. But it does not redound to the benefit of the DOE. It really would either go back to the DOD or be spent otherwise on some DOD program in the DOE.

The only point I was making with that, as I indicated to you earlier, is that one of the things I think, Mr. Chairman, that is a bit

dysfunctional in this process is that DOE manages these programs. But, unlike the DOD, let us say they save money on a missile system or aircraft, they can spend it on some other program. If he saves money on a cleanup, he does not get it; it goes. So I think the DOE has less of an incentive than you would like to rigorously manage these contracts.

But I raised this for Secretary Bodman last year. It does appear you have taken a number of aggressive steps, I have to say, and I am thankful for that. How did you discover there was a $50 billion underestimate of the cost?

Mr. RISPOLI. We found that primarily in two ways. One is that there had been an artificial wall, you might say, that precluded or kept out of our program known cleanup, much of it at Oak Ridge, much of it at Los Alamos, but really throughout the complex. You may recall that at one time the Department had proposed creating an office called the Office of Future Liabilities. The idea was to lock down the EM program to just this, period, this looking back, and all these future needs coming up would go to another office.

Well, this wall had been placed that shut out known work at Oak Ridge, Los Alamos, and other sites. So a large segment of what has to be added to the program is that artificial wall that kept these projects out.

Senator SESSIONS. You are sure these are legitimate, these are going to be necessary costs? When was this miscalculation effectuated? Before your time?

Mr. RISPOLI. It was before my time in this position. But the Deputy Secretary issued a program decision memorandum in August 2006, that essentially established my organization as the office that would take on future liabilities such as those. So that prior decision was reversed in August 2006. But I do not want to mislead you. The other part of the program growth is due to, for example, the waste treatment plant at Hanford and the resulting cost of having to operate that tank farm for many years more than we originally thought. So it is a mix of——

Senator SESSIONS. Why is it many more years than you originally thought?

Mr. RISPOLI. The waste treatment plant was——

Senator SESSIONS. Somebody should have thought about this, should he not?

Mr. RISPOLI. The waste treatment plant was envisioned to come on line much sooner and because it cannot come on line sooner, but it is sized to process so many gallons per year, that means that since it cannot begin on time. It therefore has to extend its functioning for so many more years in the future.

Senator SESSIONS. Is it entirely settled with the State of Washington what amount of waste might be left in the tanks? It that something firmed up?

[The information referred to follows:]

The Office of Environmental Management has confirmed that the 99-percent target figure is correct.

Mr. RISPOLI. The State of Washington knows how much we endeavor to remove from the tanks. If I am correct—and if I am not I will correct myself for the record—but 99 percent is the target; to remove 99 percent of the waste from those tanks and process it

through this waste treatment plant. The balance of the waste in that tank, the intent would be to grout those tanks to stabilize them so they would not collapse, and you would protect the public and the environment from whatever residual is left inside those tanks, the remaining small percentage.

Senator SESSIONS. The matters are complex. I know there are lawsuits pending. The State of Washington is making a number of demands and some of those actions have delayed matters, which increases costs. You would think that they would want to proceed as rapidly as possible. I know there are just a lot of difficulties there and I do not minimize it. I have been through cleaning up poisonous gas and I know how people in communities care about it.

But ultimately it is the responsibility of, I guess the two of you, what is safe, and what is sufficient. It is not over with me in terms of, if we could do this cleanup, which is a very vague thing in my mind—I am not sure how exact it is—you save 10 percent that is $17 billion, that is real money here.

So I hope that you will continue to manage this as closely as you can. I intend to study it more myself.

Mr. RISPOLI. Yes, Senator. If I may, again the keys are better estimates with a better evaluation of assumption of risk, stronger Federal management and oversight of our contractors, and the way we structure the contract to incentivize exactly what you are talking about, and that is saving money and saving time. Those are the elements that we are pushing on to implement as we go forward.

Senator SESSIONS. I just have to tell you that to have an announcement that we have a $50 billion error in our accounting is one of the biggest errors maybe in the history of the Republic. I do not know, but that is a lot.

Mr. RISPOLI. Yes, sir.

Senator SESSIONS. So somehow we need to watch it closely.

Thank you, Mr. Chairman.

Senator BILL NELSON. There has always been disagreement over the future for the EM and whether or not we are going to clean up past contamination and contaminated facilities, or if we are going to set an arbitrary date to stop work and other programs are going to assume the responsibility for that cleanup.

Now, the arbitrary date was not realistic. Is there, Mr. Secretary, a process for understanding and planning additional cleanup and decommissioning activities, particularly as the NNSA begins to consolidate the weapons complex further?

Mr. RISPOLI. Mr. Chairman, that is a very significant question, and in fact the August 2006 reference I made to a program decision by the Deputy Secretary essentially answers that question. The answer to that question is that as any program, whether it be the NNSA or the Office of Science or the Office of Nuclear Energy, which is in Idaho, for example. As they complete their use of facilities, if those facilities are contaminated they would become the programmatic responsibility of my program.

That is part of the reason why there is program growth, because one way or the other those facilities will have to be taken care of. The Department has chosen to put them into the EM program rather than have three or four entities on the same installation.

Let us take Oak Ridge: has EM, it has the Office of Science, and it has the NNSA. If each one were doing their own cleanup, it would be very, very hard to really recognize the full cost of cleanup and it would I think be confusing for the regulator and the State to have to deal with three separate entities doing the same type of work.

So I personally believe the decision by the Deputy Secretary, as concurred in by all of the planners in a recommendation to him, is the correct one. That is that all of these future liabilities should be turned over to the Office of Environmental Management, who would build the expertise and the contract tools to do it.

So it is program growth, but we have to recognize that part of that program growth is future liabilities that have to be added to the program. Otherwise, as you asked in your question, the NNSA would be doing some and the Office of Science would be doing some. I am not sure that would be the best way to manage this effort at a given installation.

Senator BILL NELSON. Did you ask for this job?

Mr. RISPOLI. No, sir. I was invited to this job and I am honored to be here.

Senator BILL NELSON. Mr. Podonsky, your office issued the most recent Design Basis Threat (DBT) analysis. When must all the DOE sites come into compliance with your design basis threat analysis, DBT analysis?

Mr. PODONSKY. Mr. Chairman, if you will again allow me, let me explain. I will answer your question. The DBT is not a threat assessment from the Intelligence Community. It is advised by the Intelligence Community and they give us what they consider to be concerns that we should be putting in our planning.

The DBT then becomes a tool for the security planners on strategies to be deployed, and moneys to be planned. It is a very important process. The November 2005 DBT was signed by Deputy Secretary Sell, and the agreement was that everybody would be in compliance by the end of fiscal year 2008. In fact, there are multiple sites that are moving successfully towards that completion. They have proven to be successful in the fact that the 2003 DBT, they had to be completed by the end of fiscal year 2006, which we just passed, and everybody was meeting up to those numbers.

What the Deputy Secretary also considered is that there are some sites that have special considerations that need to be planned for and budgeted for. So there are one or two sites that will not be compliant by that date of 2008, but they have exceptions from the Secretary.

What we are doing as an independent arm of the Department is we are assessing how progress is being made. Quite candidly, in a post-September 11 environment we are very concerned about how fast we lay out our protection strategies and meet those strategies.

As I have said in my opening statement, we are currently comfortable to state to you and the committee that the security assets at the Department are in fact being protected. But it is an evolving threat that we face and with an evolving threat we also have to keep in mind that we have to continue assessing the performance at those sites.

Those sites that will not be compliant by 2008, we are looking for compensatory measures to be in place so in fact nothing is going to be more vulnerable than we intended it to be.

Senator BILL NELSON. Other than Hanford, what are the ones that are not going to make your deadline?

Mr. PODONSKY. The other one as I recall is, I want to say Savannah River. They are on track, but we are watching. Off the top of my head, and I will give you a more complete answer for the record, but from the NNSA sites, Pantex, Y–12, most all of their facilities are on track. The facilities that are not on track, obviously Hanford was one, and I will have to double-check which is the other one. There are only two, I believe.

Senator BILL NELSON. Let us know for the record, and when you expect them to come into compliance.

[The information referred to follows:]

2005 DESIGN BASIS THREAT POLICY

The Department of Energy recently completed its annual review of the Design Basis Threat (DBT) Policy, which resulted in the affirmation that the 2005 DBT continues to balance complex safeguards and security, operational, fiscal, and safety planning factors to achieve a stable and long-term security planning base. Additionally, based on the lessons learned from the successful implementation of the 2003 DBT, the annual review and subsequent Departmental guidance acknowledges that the Program Offices, in conjunction with their site elements, should determine "how" and "when" the 2005 DBT will be implemented. This additional provision allows for the prudent consideration of each site's unique operational and security planning variables, and supports the most efficient means of implementation through the relocation and/or consolidation of special nuclear material and/or the application of security technologies. Based on these factors, implementation will be accomplished in a phased manner with unique and well defined milestones for each site. As an example, Pantex, the Office of Secure Transportation (OST), and Lawrence Livermore National Laboratory (LLNL) will implement the 2005 DBT by the end of fiscal year 2008, whereas Y–12 is already compliant with the 2005 DBT at one facility, and their remaining facilities will be compliant following the construction and transfer of special nuclear materials to the Highly Enriched Uranium Materials Facility (HEUMF). HEUMF illustrates the efficiencies (e.g., cost, increased survivability, etc.) that can be attained by integrating advanced security technologies in the facility design process, versus the continued reliance on manpower to address security challenges presented by antiquated facilities.

Background

For each site with a proposed implementation date beyond the end of fiscal year 2008, each site is required to systematically address their current system performance, the feasibility of compensatory and interim security measures, and the level of performance and risk over the out-years based on cost-benefit analyses. These factors combined with and coordinated among other budgeted programmatic initiatives (e.g., line-item construction projects) provided the necessary information for senior decision makers to ensure the feasibility and appropriateness of the long-term DBT implementation goals.

Status of sites:

Y–12—As noted in the National Nuclear Security Administration (NNSA) 2003 DBT Implementation Report, the 2005 DBT was fully implemented at one Y–12 facility. The remaining Y–12 facilities are scheduled to be compliant by the end of fiscal year 2011, which corresponds to completion of the HEUMF. This deferral of implementation is consistent with sound risk management principles and will result in avoidance of costly and temporary security enhancements (e.g., hiring additional protective force personnel) for those materials that will ultimately be relocated to HEUMF.

Pantex—Implementation of the 2005 DBT is scheduled to be completed by the end of fiscal year 2008.

Lawrence Livermore National Laboratory—Implementation of the 2005 DBT is scheduled to be completed by the end of fiscal year 2008.Nevada Test Site—Due to

the cost and complexity of the proposed 2005 DBT upgrades, NNSA is scheduled to implement the 2005 DBT at NTS by the end of fiscal year 2009.

Los Alamos National Laboratory (LANL)—Implementation of the 2005 DBT at LANL is scheduled for the end of fiscal year 2011. This milestone corresponds to the completion of the Nuclear Materials Safeguards and Security Upgrades Project II (NMSSUP Phase II) which provides the permanent security upgrades needed to meet the DBT requirements in a cost effective manner.

Sandia National Laboratories (SNL)—Technical Area—V at SNL will be de-inventoried below a category I/II SNM quantity by the end of fiscal year 2008 thereby eliminating the need for any additional enhancements or upgrades to meet the 2005 DBT.

Office of Secure Transportation—OST is scheduled to implement the 2005 DBT by the end of 2008.

Oak Ridge National Laboratory (ORNL)—The Under Secretary of Science rendered a non-enduring facility status determination for the ORNL facility on April 9, 2007, with notifications to the Deputy Secretary. As such, the site will maintain appropriate security measures associated with the 2003 DBT and will add additional security enhancements above this level as required.

Idaho National Laboratory—The Idaho National Laboratory has requested an extension until August 17, 2007, for submitting its implementation plan for the 2005 DBT.

Savannah River Site (SRS)—Implementation of the 2005 DBT is scheduled to be completed by the end of fiscal year 2008.

Hanford—The site is currently operating on an approved deviation, which supports relocating select materials by the end of fiscal year 2009 and delaying full implementation of the 2005 DBT. The site is using risk management principles to maximize the cost-benefit of resource allocations while providing the greatest long-term security.

Senator BILL NELSON. Senator Thune?

Senator THUNE. Thank you, Mr. Chairman, and I want to thank the panel for your work and for the recognition by your agency and by Secretary Bodman of the importance to our national security of expanding our Nation's use of renewable fuels by requiring the use of 35 billion gallons of renewable fuels by 2017.

I represent a State that has the ability to be a major contributor to this effort through the production of ethanol as well as other sources of alternative energy. I have often described my State as the Saudi Arabia of alternative sources of energy, particularly wind. We have lots of wind.

But your work on the issue is no doubt going to help us advance the cause of national security by us promoting energy security, and so I thank you for your efforts on that important issue.

Just a couple of questions if I might. This question has to do with your agency's counterproliferation programs. I would like to ask this question and respond to it if you can, but my understanding is that Russia is currently producing about 1.2 metric tons of weapons grade plutonium per year in three of its nuclear reactors. I also understand that we are working with the Russians to turn these reactors into fossil fuel power plants through the elimination of the weapons grade plutonium production program as part of our nonproliferation efforts.

When do you anticipate that this transformation from nuclear reactor to fossil fuel plant will occur, and why is it that the Russians continue to manufacture what seems to be a needlessly large amount of weapons grade plutonium and simply increasing the risk that it could fall into the hands of terrorists?

Mr. RISPOLI. Senator Thune, thank you for that question. I am familiar with that program from a prior position in the Department. I know about the initiative in two of the former Russian nu-

clear cities to replace the weapons-producing reactors with fossil power plants. Unfortunately, that program is not part of my purview, so I can take that question for the record, but I cannot answer that question.

[The information referred to follows:]

- The three remaining Russian plutonium-production reactors, which are graphite-moderated reactors built in the 1960s, provide essential heat and electricity to the nearby cities of Seversk and Zheleznogorsk. They also, as a function of their operation, produce weapons-grade plutonium. Plutonium production is a byproduct of the production of heat and electricity. One action cannot occur without the other.
- DOE/NNSA's Elimination of Weapons Grade Plutonium Production (EWGPP) program, which is being conducted under the auspices of the Plutonium Production Reactor Agreement between the United States and Russia, seeks to eliminate the production of weapons-grade plutonium from these reactors. Under the EWGPP program, the United States is working with the Russian Federation to build fossil fuel power plants that will provide replacement heat to the cities surrounding the plutonium-producing reactors. In exchange, the Russian Federation has agreed to permanently shut down the reactors.
- It is anticipated that the first two reactors will permanently shut down by December 2008 when the fossil fuel plant will come on line in Seversk. Weapons grade plutonium production will decline from approximately 1.2 metric tons per year to approximately 0.4 metric tons per year. The last reactor in Zheleznogorsk is scheduled to be permanently shut down by December 2010 with the last fossil fuel plant beginning operation at that time, ending weapons-grade plutonium production in the Russian Federation.

Senator THUNE. That would be great if you could.

Do either of you happen to know, and I just ask this question, how much weapons grade plutonium the U.S. manufactures annually?

Mr. RISPOLI. I believe the answer to that is zero today, yes, sir.

Senator THUNE. That was my assumption.

Mr. RISPOLI. Now, of course, my program is working together with the weapons side of the house, the NNSA, to disposition the excess plutonium that is in our departmental inventory, with the purpose of reducing the potential for proliferation into the wrong hands. So we and our NNSA partners are working toward that and, as I mentioned a little while ago, we just delivered today to this committee and others a business case analysis of the approach for disposing of surplus weapons grade and weapons usable plutonium. This is the most current thinking as to how we would do that. Basically, we would do that at the Savannah River site in South Carolina.

Senator THUNE. Mr. Podonsky, in terms of personnel security, I also want to touch on the issue of the October 2006 case of the classified documents that were removed from Los Alamos by a contractor. From what I understand, the security lapse would probably not have been discovered had it not been for a domestic disturbance at the contract employee's home. It turned out that this contractor has classified files at her residence, and we have also learned that the contractor had been using illegal drugs within 30 days of her security clearance being approved.

Given the emphasis on safety and security within your agency, could you perhaps inform us on the steps that are being taken to correct the personnel security deficiencies at Los Alamos?

Mr. PODONSKY. Yes, Senator. Secretary Bodman initiated two task forces. One was looking at the cybersecurity. That was headed

up by our Chief Information Officer, Tom Pike. The other was the task force on personnel security that he asked the three under secretaries and myself to head up, with my office taking the lead.

What we concluded and made recommendations to the Secretary that he agreed to is that the security professionals that are in the business of making the determinations on security clearances, we needed to have a more robust training and a certification, which was not taking place previously. We needed to do an implementation of a more rigorous drug testing program within the Department. We needed to take a look at the policy for personnel security to make sure that it was consistently applied, and in order to do that redouble our efforts for quality control over the decisions that were being made out in the field elements.

Then the final one was to develop an organization where all the personnel security functions came into one organization. The Secretary finally decided, with the Deputy Secretary, that that organization would reside within my office. So we are moving out to look at the setting up of that program, and are making sure that we have the policies in place that are going to be fully implemented and understood.

Our national training center, which also falls under us, we have a training program and a certification program being set up right now as we talk. We have instructed our inspectorate to make sure that they redouble their efforts in terms of inspecting what they are doing out there in the personnel security environment.

The other thing that we also are doing is doing a complete review of the case files during that time period of the subject review. We did an initial review while we were there. Coincidentally, when we were at Los Alamos at the time that this broke, we were already doing a regular scheduled inspection. Part of our inspectorate went down to Albuquerque service center and took a look at the cases, and in a closed session I can tell you what we found. But we did find that the steps that the Secretary agreed to were very important to take.

Senator THUNE. Let me just ask you one other question. You are the Chief Health, Safety, and Security Officer for the Department. Regarding another issue I guess you could argue on personnel security and cybersecurity within the agency, but the Federal Emergency Security Management Act, which establishes procedures to ensure information security within all agencies of the Federal Government. I assume you are probably aware that that annual scorecard that is issued by the House Government Reform Committee ranking member last year graded your agency as an F in information security, this year has upgraded to a C-minus.

Obviously, as the steward of our nuclear stockpile, top-notch information security is absolutely critical. I appreciate the fact that you are obviously taking significant steps to improve cybersecurity and I think that is reflected in the improvement in your FESMA score. But I wonder if you could tell us your thoughts on your agency's score, what steps you plan to take to further improve security at your agency. My understanding is that, as you said, the task force has been established, and if you could just elaborate a little bit on that.

Mr. PODONSKY. Mr. Pike is our chief information officer and he is responsible for the policies for cyber. Those are the only policies that we do not have in our organization. We are responsible for the independent oversight and we are working very closely with Mr. Pike because over the last decade we have seen a number of issues with cybersecurity throughout the complex. We have seen some improvements in terms of the understanding of what their implementations are, but we have a long way to go.

In fact, the entire Government has a long way to go. I would tell you, Senator, it is not the physical security part of our Department or any other agency that I worry the most about. I worry mostly about our cyber world. We have a cyber penetration lab out in Germantown, Maryland, and at one point we actually moved it here to the floor of the House to do a live demonstration of how easy it is for hackers to get into unclassified arenas.

We have a red team, which is a no-notice penetration team, that if you rank order kiddie hackers at, say, a level 3 and more sophisticated hackers at a level 2, and then nation states—and I will not go into classified here—that are really sophisticated, we are at a high level 2, and we are constantly challenging the Department and its capabilities. So when we talk about the improvements, there have been improvements under Mr. Pike's leadership and with Secretary Bodman's encouragement and support. But we also continue to do active security attacks ourselves using our penetration lab to still continue to plug the holes.

Part of the problem for the entire Government, not just the Department, is how fast the dynamics of the threat is in the cyber world. No sooner do we plug a hole, fix vulnerability, than they figure out another way to come. So it is a real challenge.

The rating systems that are in the Government Reform—and it is notable that the Department moved up, but it would be much better for our agency to be at a much higher level, considering all that we are protecting.

Senator THUNE. I assume that we are trying to hire all the best counter-hackers to make sure that we are meeting the skill sets and the level of capability that the hackers have to get in? I mean, you are absolutely right, this is a very serious threat and it is the world we live in. If there are resource issues associated with that, that we need to address, certainly let us know what those are, because I, like you, am very concerned, not only with your agency, which because of its stewardship of the nuclear stockpile is critical, but I think in every agency of Government this is a very serious, again, real world threat that we face.

Mr. PODONSKY. Senator, if I might add, and Mr. Chairman, from a classified, our classified network is very well protected. It is the other areas, the research and development. It is the unclassified arena that we are all very concerned about, and I think every one of us in Government should be concerned about the cyber world.

Senator THUNE. Thank you.

Thank you, Mr. Chairman.

Senator BILL NELSON. Secretary Bodman's statement will be made a part of the record and the record will stay open for 4 days.

The hearing is adjourned. Thank you.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR BILL NELSON

RELIABLE REPLACEMENT WARHEAD

1. Senator BILL NELSON. Secretary Bodman, one of the most difficult decisions that Congress will face this year with respect to your Department is whether or not to begin the research funds for the Reliable Replacement Warhead (RRW). How important is it in your view that funds be made available for the phase 2A study on the RRW?

Secretary BODMAN. Funding for the RRW Phase 2A Design Definition and Cost study is very important. The 18-month study conducted in 2005 and 2006 determined that development of replacement warheads with larger performance margins and certifying them without additional underground nuclear testing are feasible. The Phase 2A study will develop the detailed cost, scope and schedule baseline for the RRW which is needed by National Nuclear Security Administration (NNSA), the Department of Defense (DOD), and Congress in order to make informed decisions on whether and how to proceed to the engineering development phase.

2. Senator BILL NELSON. Secretary Bodman, in testimony before the House Armed Services Committee, former Senator Sam Nunn said, with respect to the RRW, "I believe that this will be misunderstood by our allies, exploited by our adversaries, and complicate our work to prevent the spread and use of nuclear weapons." Senator Nunn went on to say that the RRW would be better received in the context of a ratified Comprehensive Test Ban Treaty. What consultations have occurred with other nuclear weapons states such as Russia, France, the United Kingdom, and China, as well as non-nuclear weapons states who are friends and allies, and with what result?

Secretary BODMAN. In advance of the announcement of preferred RRW design, the Department of State and the Department of Energy (DOE) consulted with allies of the United States to ensure that they would have accurate information relating to the RRW.

Specifically, the Department of State consulted with the North Atlantic Treaty Organization (NATO) countries, Japan, South Korea, and Australia, and also with Russia, Ukraine, and China in advance of the joint DOD–DOE March 2, 2007, announcement of the selection of the preferred RRW design. Information about the March 2 RRW announcement was also sent to other U.S. diplomatic posts for use if asked by other governments. In addition, both before and after the March 2 announcement, DOE officials met in Washington with officials from the embassies of the United Kingdom, Japan, France, Germany, and Denmark, at their request, to discuss RRW and proposed plans for the Complex 2030 transformation. All feedback received from foreign governments was positive and none have expressed any concern with regard to our plans for RRW.

ANNUAL CERTIFICATION PROCESS

3. Senator BILL NELSON. Secretary Bodman, the annual certification process includes a review of each weapon in the stockpile by the laboratory directors, the Commander of the Strategic Command, you, and the Secretary of Defense. You are just in the process of finishing an annual review for 2006. Is the stockpile safe, secure, and reliable?

Secretary BODMAN. Yes, the 2006 report will reflect that the stockpile is safe, secure and reliable and that resumption of underground nuclear testing is not required at this time.

4. Senator BILL NELSON. Secretary Bodman, any decision to build or deploy an RRW is years away. But in thinking about the RRW and the ongoing annual certification process, how would you think about establishing an annual certification process for the RRW?

Secretary BODMAN. If an RRW design is eventually produced and placed into the stockpile, it will be reviewed in the annual assessment process along with the other warheads in the stockpile. The NNSA design laboratories would employ the same broad approach used to verify the continued performance of existing warheads. The approach employs tools developed under the Stockpile Stewardship Program, including a combination of extensive experiments, computational tools, data analysis from past nuclear tests, and peer review. The RRW will be designed so that key performance parameters are farther away from failure points (have greater margin) than current warheads designed for high yield to weight. Improved warhead performance margins that will be incorporated into the design will reduce uncertainty due to

aging, and reduce the likelihood that underground nuclear testing will be required in the future to resolve a technical problem in the stockpile. The quantification of margins and uncertainties for key performance parameters will aid in understanding the limits of the performance and be the basis for the laboratory directors' certification of a RRW design. Engineering and non-nuclear components will have a rigorous testing program and the design for these features will consider life-cycle surveillance needs. This approach will give designers higher confidence in their ability to certify the design without underground nuclear tests.

5. Senator BILL NELSON. Secretary Bodman, does the Office of Science play a role in the annual certification process? If so, what role and why?

Secretary BODMAN. The Deputy Administrator for Defense Programs has primary responsibility for the coordination and work involved in the annual assessment process for the nuclear stockpile. The role of the Under Secretary of Science in that process is to serve as an independent advisor to the Secretary and to provide his independent advice and recommendations.

PROJECT MANAGEMENT

6. Senator BILL NELSON. Secretary Bodman, the DOE builds first-of-a-kind, or one-of-a-kind, technically-complex projects. In many instances these projects have experienced significant cost overruns and schedule delays. The Office of Engineering and Construction Management (OECM) was established to help provide an independent review and assessment of the cost and schedule baseline for these projects. Initially this office reported directly to the Deputy Secretary of Energy and had independent budget authority, and had started to require independent cost estimates (ICEs) for projects. I am concerned that the flexibility of the office, as well as the rigor and the funding for the office has diminished. The funding is provided from program offices and the ICEs have been replaced by cost reviews—reviews of the contractors costs but not an independent cost development. How is the funding provided to OECM in the fiscal year 2008 budget request?

Secretary BODMAN. ICEs have not been replaced by independent cost reviews (ICR). As part of an External Independent Review (EIR), the OECM determines whether an ICE or an ICR is conducted based upon the respective project's complexity and risk profile. In fiscal year 2008, the DOE Programs fund OECM's EIRs.

7. Senator BILL NELSON. Secretary Bodman, must the OECM rely on any program office, also known as working capital funds, for funding?

Secretary BODMAN. The Department had plans to fund EIRs through the DOE Working Capital Fund (WCF), but was unable to implement this arrangement due to the continuing resolution in fiscal year 2007, Currently, the DOE Programs continue to provide funding for their respective EIRs directly to OECM.

8. Senator BILL NELSON. Secretary Bodman, does the OECM still review NNSA projects?

Secretary BODMAN. Yes, DOE Order 413.3A, Program and Project Management for the Acquisition of Capital Assets, applies to NNSA capital asset projects having a Total Project Cost greater than or equal to $20 million. As required by this order, OECM still reviews applicable NNSA projects.

9. Senator BILL NELSON. Secretary Bodman, when was that last time the Institute of Project Management reviewed the DOE project management process and are any future reviews scheduled?

Secretary BODMAN. To the best of the Department's knowledge, the Project Management Institute has not reviewed the DOE project management process and no reviews are planned. However, the National Research Council has reviewed project management at DOE several times, the last report being issued this year. Also, the Government Accountability Office has reviewed the Department's project management processes and issued a report in May 2007 (GAO–07–51S, Department of Energy: Consistent Application of Requirements Needed to Improve Project Management). The report found that, although the Department needs to improve project performance by ensuring that its project management requirements are consistently followed, DOE has improved its approach to project management by addressing weaknesses in key areas. The Department's OECM has ratcheted up its efforts to enforce compliance across the agency.

10. Senator BILL NELSON. Secretary Bodman, will the OECM review projects to determine if the project includes and addresses all safety concerns including nuclear operating safety?

Secretary BODMAN. The Department is committed to performing all work so missions can be accomplished with adequate controls in place to protect the public, workers, and the environment. DOE's project management process is documented in DOE Order 413.3 A, Program and Project Management for the Acquisition of Capital Assets. The OECM recently updated this order to enhance the Department's integration of safety early into design and construction. One enhancement was to require a Technical Independent Project Review as part of Design Reviews for high-risk, high-hazard and Hazard Category 1, 2, and 3 nuclear facilities. The order also requires that hazards be identified and safety be appropriately addressed throughout the life cycle of a project as part of the safety management systems for the project. As part of its EIRs, OECM assesses whether projects have reasonably considered and addressed all Nuclear Regulatory Commission (NRC) and Defense Nuclear Facilities Safety Board (DNFSB) issues. If not, the EIR team identifies the outstanding issue(s), ascertains when they will be resolved, and determines what risks they pose.

11. Senator BILL NELSON. Secretary Bodman, how will the OECM and the DNFSB engage so that OECM is fully aware of all nuclear operating safety issues raised by the DNFSB?

Secretary BODMAN. The Department continues to enjoy a productive relationship with the Defense Nuclear Safety Board (DNFSB). As part of its EIRs, the OECM assesses whether Hazard Category 1, 2, and 3 nuclear facilities projects have reasonably considered and addressed all DNFSB issues. If not, the EIR team identifies the outstanding issue(s), ascertains when they will be resolved, and determines what risks they pose.

QUESTIONS SUBMITTED BY SENATOR JEFF SESSIONS

CONTROLLING CONTRACTOR HEALTH CARE AND PENSION COSTS

12. Senator SESSIONS. Secretary Bodman, last year, I supported an initiative you began, to try to control the costs for medical and pension benefits being provided by DOE contractors. The costs of these contractor benefits are born solely and entirely by DOE as a pass-through cost under DOE contracts. Analysis at that time indicated that the costs DOE was reimbursing for pension and medical expenses were higher than industry norms. Under substantial pressure from Members of Congress representing DOE sites, you suspended the effort to reform these costs reimbursements. Where does this effort to bring contractor costs for these benefits in line with industry averages now stand?

Secretary BODMAN. During the suspension of this initiative, we have been meeting with DOE stakeholders, including Members of Congress and other interested parties in an effort to seek their input and/or concerns as we consider alternatives to meeting the challenge posed by increasing costs and liabilities associated with contractor employee pension and medical benefits. In addition, on March 27, 2007, the Department published a Federal Register notice to seek public comments and/or recommendations on how DOE should address this challenge. Currently, we are reviewing over 400 comments in response to the Federal Register notice. These comments will be taken into consideration as the Department seeks to determine how to best balance its responsibility for funding important national missions while providing contractors sufficient flexibility to offer benefits that will both attract and retain qualified new workers and treat incumbent contractor employees and retirees and their beneficiaries fairly.

YUCCA MOUNTAIN NUCLEAR REPOSITORY

13. Senator SESSIONS. Secretary Bodman, this subcommittee authorizes the defense funding which goes toward the development of the national high-level waste repository at Yucca Mountain. This defense funding, in the amount of about $300 million in fiscal year 2008, is added to the approximately $200 million in civilian funding from the electric bills of customers in areas with nuclear power plants. The disposal program, however, is well behind its statutory deadline of 1998 for an operating repository. Why should electricity consumers and other citizens have confidence that the waste repository is on a path to opening eventually?

Secretary BODMAN. The administration is strongly committed to having a repository, which is vital to the Nation's energy and national security needs, operational as soon as possible. The Director of the DOE Office of Civilian Radioactive Waste Management has put into place an effective plan to submit a high-quality license application to the NRC on or before June 30, 2008, and to move forward with the licensing, construction and operation of the repository. To ensure that the repository can commence operations as soon as practicable, I urge Congress to pass the administration's proposed legislation which addresses many of the uncertainties beyond the Department's control that could significantly delay the receipt of an NRC construction authorization and the repository's opening.

14. Senator SESSIONS. Secretary Bodman, what year does DOE project the repository will begin to accept the waste that is piling up around the Nation?

Secretary BODMAN. In fiscal year 2006 the Department released a "best-achievable" schedule for the start of repository operations in 2017 which is contingent on a number of factors, including enactment of the administration's proposed legislative package, appropriations consistent with estimated costs, timely issuance of all necessary authorizations and permits, and the absence of litigation-related delays.

15. Senator SESSIONS. Secretary Bodman, for the last 3 years, since fiscal year 2005, Congress has supported, on a bipartisan basis, the continued study of the RRW. DOE's budget for fiscal year 2008 requests funding of $88 million to continue design and cost studies. This year, outside critics and anti-nuclear groups are becoming very vocal against any continued study. I believe that my chairman, Senator Nelson, and I have worked together in the best spirit of bipartisanship on the RRW—to advance the RRW in a measured and thoughtful way, with careful study and deliberations. I hope we will continue to do so. Have you personally involved yourself in the evaluation of the RRW and does this program have your personal commitment and active support?

Secretary BODMAN. I have been briefed by the NNSA Administrator and his staff on the results of the RRW Feasibility Study. I agree with and support the Nuclear Weapons Council determination that the RRW should be pursued to sustain the Nation's nuclear weapons stockpile for the long-term without the need for underground nuclear testing. I also support the Council's decision to conduct a Phase 2A Design Definition and Cost study to develop the detailed cost, scope and schedule baseline for the RRW which is needed by NNSA, the DOD, and Congress in order to make informed decisions on whether and how to proceed to the engineering development phase.

16. Senator SESSIONS. Secretary Bodman, why do you believe the RRW program is needed?

Secretary BODMAN. The RRW program is needed to assure long-term confidence in the reliability of the nuclear weapons stockpile. An RRW-based stockpile has the potential to significantly reduce the size of the country's nuclear stockpile while transforming the nuclear weapons complex into a smaller, more responsive enterprise.

Specifically, the RRW program will enhance the security of nuclear weapons through the use of state-of-the-art technology to prevent unauthorized use by terrorists, rogue nations or criminal organizations; improve the safety of the stockpile through upgrades, such as the use of insensitive high explosives rather than conventional high explosives; help develop a more responsive nuclear weapons infrastructure by using replacement components and assemblies that are easier lo manufacture and maintain; exercise critical nuclear weapons design and production skills; enable a reduced stockpile size by increasing confidence in the infrastructure to produce weapons if and when they are needed; and decrease the likelihood that a nuclear test will be needed in the future to confirm weapon performance.

[Whereupon, at 3:54 p.m., the subcommittee adjourned.]

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