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S. HRG. 107–696, PT. 7

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2003

HEARINGS

BEFORE THE

COMMITTEE ON ARMED SERVICES
UNITED STATES SENATE

ONE HUNDRED SEVENTH CONGRESS

SECOND SESSION

ON

S. 2225

AUTHORIZING APPROPRIATIONS FOR FISCAL YEAR 2003 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

MARCH 7, 13, 20; APRIL 10, 11, 2002

Printed for the use of the Committee on Armed Services

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DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2003

THURSDAY, MARCH 7, 2002

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

BALLISTIC MISSILE DEFENSE PROGRAM AND BUDGET

The subcommittee met, pursuant to notice, at 2:57 p.m. in room SR–232A, Russell Senate Office Building, Senator Jack Reed (chairman of the subcommittee) presiding.

Committee members present: Senators Reed, Byrd, Bill Nelson, Inhofe, and Allard.

Committee staff member present: David S. Lyles, staff director.

Professional staff members present: Kenneth M. Crosswait and Richard W. Fieldhouse.

Minority staff members present: L. David Cherington, minority counsel; Brian R. Green, professional staff member; and William C. Greenwalt, professional staff member.

Staff assistants present: Dara R. Alpert and Thomas C. Moore.

Committee members' assistants present: Erik Raven, assistant to Senator Byrd; Elizabeth King, assistant to Senator Reed; Peter A. Contostavlos, assistant to Senator Bill Nelson; J. Mark Powers and John A. Bonsell, assistants to Senator Inhofe; Douglas Flanders, assistant to Senator Allard; Arch Galloway II, assistant to Senator Sessions; and Kristine Fauser, assistant to Senator Collins.

OPENING STATEMENT OF SENATOR JACK REED, CHAIRMAN

Senator REED. Let me begin the hearing. Senator Allard, our ranking member, is on his way, and I believe others may be joining us, but I want to welcome General Kadish and Secretary Aldridge. Thank you for appearing this afternoon. I will give my opening statement and when Senator Allard arrives, recognize him for his opening statement as well as other Senators. At the conclusion of our statements, we would ask General Kadish and Secretary Aldridge to make their opening statements.

Mr. Secretary, I am told you did not submit a statement for the record.

Secretary ALDRIDGE. No, sir. I have one for next week when we talk about the management issues. I just have a very short verbal presentation.

Senator REED. Thank you very much.

The Strategic Subcommittee meets this afternoon to receive testimony on the Department of Defense Ballistic Missile Defense (BMD) program and budget. Our two witnesses today are the Honorable E.C. Pete Aldridge, Under Secretary of Defense for Acquisition, Technology, and Logistics, and Lt. Gen. Ronald T. Kadish, Director of the newly organized Missile Defense Agency (MDA).

Secretary Aldridge is in charge of all major defense acquisition programs for the Department, including missile defense programs. I want to thank him for being here today to help us put the missile defense budget in the context of the overall acquisition budget. General Kadish is, of course, well-known to members of this subcommittee. I welcome you here once more, General.

This is the first of two scheduled hearings this subcommittee will have on the subject of missile defense. This hearing will focus on how the Defense Department plans to spend the $7.5 billion it has proposed for ballistic missile defense in fiscal year 2003, as well as how it intends to spend over $40 billion it has planned for fiscal years 2003 through 2007.

The second hearing, scheduled for next week, will focus on the changes in oversight and acquisition policy the Department is implementing for ballistic missile defenses. I have substantial concerns with the large scope of these changes in oversight and policy, and I believe a number of my colleagues have similar concerns. However, I would urge my colleagues to save oversight-related questions until next week's hearing. We have plenty on our plate today in establishing a fair understanding of this large and complex missile defense budget proposal.

It is, indeed, critically important to understand the budget that has been proposed for missile defense, and to make sure we are spending our money wisely and efficiently in this area. The theater ballistic missile threat to our deployed forces exists today, and it has existed for over a decade. A ballistic missile threat to our homeland could materialize as well, although the likelihood and timing of such a threat, and its magnitude, are subjects for debate.

The administration has proposed spending a prodigious sum of money on missile defense in fiscal year 2003, as it did for the current fiscal year, but spending vast amounts of money does not guarantee anything but expensive operations of government contracts. Unless that money is spent wisely, this country will not proceed expeditiously on a course to either effective theater missile defenses for our troops or an effective national missile defense (NMD) for our homeland.

Increases in funding do not guarantee success for programs as complex and difficult as missile defense, and unfortunately an example of this is the much-touted PAC–3 missile defense program. It had a string of notable test successes which led to the administration's proposing a $300 million increase in the program for fiscal year 2002, mostly to buy missiles. Congress enthusiastically added $82 million more to the administration's request, but the $382 million in additional funds did not prevent a PAC–3 system from missing two out of three targets during its last flight test on February 16.

This is not an indictment of PAC–3, but it should awaken us all to the fact that funding itself does not ensure success, and nothing can replace realistic flight tests to determine the operational effectiveness of a missile defense system. That is why I am encouraged by the administration's new focus on ballistic missile defense testing.

We must keep in mind that every billion dollars spent on missile defense is a billion not spent on counterterrorism efforts, on increased protection for our ports and borders, on biowarfare defenses, on vaccines for our citizen soldiers, on cooperative programs to reduce the threat of nuclear weapons and other weapons of mass destruction, on transformation of the Army into a more mobile, lethal, and relevant force, on our much-needed Navy ships, and on a host of other crucial programs.

Last year, the administration's missile defense program was long on funding but short on details. Despite numerous hearings on missile defense and a very long briefing that General Kadish was gracious enough to provide members of this subcommittee, we were left with a number of important unanswered questions, such as: What is the administration's overall plan for missile defense? What does it mean to say that the administration has a goal of employing a ballistic missile defense system that layers defenses to, "defend the U.S., deployed forces, allies, and friends?" When might such a vast defensive network be deployed? What would it look like? How much would it cost?

As I mentioned before, our troops overseas are facing the threat of hundreds of short- to medium-range theater ballistic missiles right now. When will effective theater defenses, such as Theater High Altitude Area Defense (THAAD), Navy Theater-Wide, and the Navy Area-Wide be deployed? How many such systems will be bought?

As for national missile defense, why does the administration plan appear to be at odds with its rhetoric? In testimony before the full committee last year, Deputy Secretary of Defense Paul D. Wolfowitz sounded positively alarmed about the prospect of imminent ballistic missile attacks from North Korea. He said, "in 1998, North Korea surprised the world with its launch of a Taepo Dong missile over Japan with a previously unknown and unanticipated third stage. If we do not build defenses against these weapons now, hostile powers will soon have or may have already the ability to strike the United States and allied cities with a nuclear, chemical, or biological weapon." But the administration is not building missile defenses now.

Under President Clinton's national missile defense plan, construction of an extant radar in Alaska would have been done this spring. The construction of this radar, coupled with continued flight tests and the eventual production of interceptor missiles, would have provided the best defense against North Korean missiles. Yet last year, the administration requested no funding for such a radar. It will not be built this year.

With the huge amount of funding it received last year for missile defense, why didn't the administration begin to build the best national missile defense we know how to build? Now that the ABM Treaty issue is decided, for better or worse, does the administration

intend to start building our best available defensive systems next year? Is it funded in the fiscal year 2003 request? It appears that the answer to these questions is no.

Other questions on national missile defense that remain unanswered include the following: How much might the administration's national missile defense plan cost? The Congressional Budget Office recently estimated that a layered national missile defense system could easily exceed $150 billion. How effective will the administration's national missile defense be? How will it be tested, and how realistic will the tests be? Will realistic countermeasures be used, and will our system be able to overcome them?

One reason the administration gave last year as to why they could not answer these questions was that their approach to missile defense was evolving, with no plan yet in place. How much do we want to spend just on evolution? The administration has now been in office for over a year, and is well into spending the nearly $8 billion for missile defense Congress provided in fiscal year 2002.

Secretary Aldridge and General Kadish, I hope you will provide better and more complete answers to these types of questions this year than we were provided last year.

I should add that our staff will coordinate closely with the Senate Appropriations Committee staff this year, as we did last year, so the answers you provide to our questions will also help the appropriators do their job. I would note not only the presence of my colleague, the ranking member, Mr. Allard, but also the Chairman of the Senate Appropriations Committee, Senator Byrd.

I strongly support rapid deployment of theater ballistic missile defenses for our troops as soon as we can prove these defenses will work. I also continue to support research and development of a national missile defense for our homeland, but I also want that system to be proven to work before we deploy it.

Finally, I believe ballistic missile defense funding should be balanced with other pressing national security needs. The events of September 11 have changed attitudes on our security and missile defense. The American people, both Service members and citizens, want and deserve protection from the most likely and dangerous potential threats. It is up to both the administration and Congress to be smart about how to best protect them.

Now, before we turn to our witnesses, let me recognize the ranking member, my colleague, Senator Allard, and then Senator Byrd.

STATEMENT OF SENATOR WAYNE ALLARD

Senator ALLARD. Thank you, Mr. Chairman. I want to welcome our witnesses today. Secretary Aldridge, it is a pleasure to have you here today, and General Kadish, it is good to see you again. We appreciate your willingness to take time out of your busy schedules and your efforts to assure that all Americans are protected from weapons against which we do not yet have an effective defense, ballistic missiles.

How, and even whether, we should develop and deploy such defenses has been a matter of serious controversy for nearly 20 years. In many ways, the debate on missile defense represents a fundamental difference in approach to national security. One relied on arms control and special bilateral arms control agreements be-

tween the Soviet Union and the United States as the central aspect of our defense. From this perspective, the ABM Treaty was consistently described as "the cornerstone of strategic stability."

The other view is that the United States needs to provide for its own defense and cannot afford to rely exclusively on agreements with adversaries to limit the threats it has to face. From this perspective, arms control agreements such as the ABM Treaty are less significant, and the development of military capabilities needed to meet threats, including the ballistic missile threat, is paramount.

I believe that the end of the Cold War has strengthened the argument that bilateral arms control with the Soviet Union no longer addresses our central security concerns. Ballistic missiles and weapons of mass destruction have proliferated, posing significant and increasing threats to the United States, its allies, friends, and deployed troops. An arms control agreement that prevented the development of effective defenses seems to me to be increasingly out of touch with our security needs. It was in this context that President Bush last December 13 made the courageous decision to withdraw from the ABM Treaty.

Some will no doubt continue to believe that this decision was mistaken, but the decision has been made. Russia and our allies have accepted the decision, and predictions of Russian withdrawal from other arms control agreements and an unconstrained arms race appear to have been inaccurate, and the means and the nature of the BMD debate have changed.

This is not a philosophical argument any more. The passions generated by a commitment, well-meaning and honestly held, to an arms control framework at the center of which stood the ABM Treaty must be replaced by rational consideration of how to achieve effective ballistic missile defense capabilities as efficiently and promptly as possible.

I fear, however, that the emotion of the past debates continues to play a large role in the shaping of the subcommittee agenda. The chairman has decided that we will have two hearings on the Missile Defense Agency and its budget of about $6.7 billion.

As important as the ballistic missile defense program is, I must note that the subcommittee's jurisdiction is broad, and includes many difficult issues that we need to address, some of which we will now in all likelihood give insufficient attention. Indeed, I had hoped for a separate hearing on space programs and management, since a number of space programs have run into technical, schedule, and cost challenges, and the management and oversight processes for space programs are going through a period of substantial reform. Instead, all space and strategic programs, with a combined budget of about $40 billion, will be covered in one hearing.

I am pleased, Mr. Chairman, that we have reached an agreement to schedule time to deal with issues related to the Department of Energy environmental management (EM) programs. The EM budget request for fiscal year 2003 is $6.7 billion, almost exactly the same as MDA's request, and includes a major reform initiative that promises to speed the cleanup of former nuclear weapons facilities by decades. This initiative is important not only to the Department of Energy but to all Americans who live near these sites, and it deserves our attention.

I look forward to working closely with you to find a time convenient not only to you and me but all our interested subcommittee members, Mr. Chairman. While I am still not satisfied that the subcommittee is pursuing a more balanced approach to the broad and complicated issues over which we exercise our authority, I respect the majority's right to have the hearings they want to have. I do not question in any way their motives, and I understand that they have serious concerns about the missile defense program.

Thus, we will hear over the next two subcommittee hearings many criticisms from some of our colleagues about the priority accorded to missile defense, the efficacy of missile defense programs, and the approach taken to the development of missile defense capabilities. I believe that most of these criticisms are baseless. For example, critics of missile defense often maintain that ballistic missiles pose the least likely threat that the Nation must face. This is simply false. Ballistic missiles pose the most likely threat we must face. Indeed, we face it today.

Missiles and weapons of mass destruction are meant to deter. I know my colleagues on the other side of the aisle believe this. They have often argued that our own nuclear force levels are too high, and that effective deterrence does not require that many nuclear weapons. According to the latest national intelligence estimate (NIE), our Nation faces a likely ICBM threat from Iran and North Korea, and a possible threat from Iraq. Dozens of nations have short- and medium-range ballistic missiles already in the field that threaten U.S. interests, military forces, and allies.

The clear trend in ballistic missile technology is toward longer range and greater sophistication. Once deployed, these missiles threaten the United States, its allies and friends, and its deployed troops. No one has to fire them to be effective. I want to repeat that. No one has to fire them to be effective. They are effective by their mere presence.

The NIE does conclude that other forms of attack are more likely than missile attack, but it also concludes that nations hostile to U.S. interests are developing these capabilities precisely to deter the United States, and that the likelihood that a missile with a weapon of mass destruction would be used against U.S. forces or interests is higher today than during most of the Cold War, and will continue to grow as the capabilities of potential adversaries mature.

The NIE simply reinforces the conclusion presented by our committee chairman last May when he said, "the question is not whether there is or will be a threat to the United States from ballistic missiles. There is, or probably will be soon, from North Korea." Still, some critics may continue to argue that such nations would never dare attack, knowing that our vastly superior forces could destroy them. Again, I disagree. We already know that our adversaries believe that we can be deterred from pursuing our interests.

A week ago, the Emerging Threats and Capabilities Subcommittee received some remarkable testimony from Mr. Charles Duelfer. In his capacity as the Deputy Executive Chairman of the U.N. Special Commission on Iraq, known as UNSCOM, he had the oppor-

tunity to interview senior Iraqi ministers on Saddam Hussein's perceptions of the Persian Gulf War.

Now, many of us are aware the United States threatened Iraq with extraordinary, regime-ending consequences should that nation use chemical or biological weapons against coalition forces during the conflict. The use of this threat has been seen as triumph of deterrence, but according to Mr. Duelfer, Iraq loaded chemical and biological warheads on ballistic missiles, and authority to launch those missiles was delegated to local commanders with no further intervention or control by higher Iraqi authorities, with orders to launch if the U.S. moved to Baghdad, and we never attacked Baghdad. The Iraqi regime survived, and survives to this day, and they would attribute that survival to the deterrent effect of missiles and weapons of mass destruction.

The argument that missiles pose the least likely threat, or that we can deter all of our adversaries, is a precursor to the contention that Missile Defense Agency funding could better be spent on other defense programs. This, too, I think is incorrect. How should we compare it? We have only very limited capability to defend against ballistic missiles, and the current BMD program is attempting something that we have never done before: an effective missile defense system that integrates the capabilities of dozens of projects.

We propose to spend $6.7 billion this year to do this, less than requested last year by about $300 million. We have substantial legacy capabilities in every other mission area, yet the budget request proposed to spend over $35 billion to counter the terrorist threat. We will spend $11.3 billion on three tactical aircraft programs in 2003, and probably about $350 billion over the lifetime of these programs. We will spend about $20 billion on space programs in 2003.

I do not argue that funding other systems is unjustified. Indeed, I support robust programs in all of these areas. I argue that spending on missile defense is not out of line, given the magnitude of the challenge and the severity of the threat. I confess that the logic of the argument that we are short of ships and airplanes so we do not need missile defense escapes me.

Again, to quote our committee chairman, Senator Levin, speaking specifically about our national missile defense system, "I do not believe that cost will be a major impediment," but that raises another point of the critics that we may hear today, that the focus within the missile defense program is wrong. Thus, we need to spend less on national missile defense and focus more on theater missile defense that would protect our allies, friends, and deployed troops.

Of course, last year, our colleagues sought to cut $1.3 billion from missile defense, about half of which could be reasonably defined as theater missile defense, but fundamentally we have to recognize that there is no clear dividing line between national missile defense and theater missile defense. A system like THAAD, the theater system for the United States, might be the German national missile defense, or perhaps THAAD will contribute to the U.S. national missile defense mission by protecting U.S. territories, or if the system is upgraded, protecting the U.S. from long-range missiles.

What we used to call the ground-based national missile defense system could, depending on where it could be based, defend Northern Europe from intermediate-range missile threats from the Middle East. Some boost-phase systems could shoot down missiles at any range. The whole notion behind the proposed ballistic missile defense program is to develop a single integrated missile defense system that can deal with threats of all ranges, and an architecture that is determined by threat assessments and technical maturity, and we need to move beyond terms that have largely lost their meaning.

There is no doubt that we will hear from many members concerns about specific programs. No doubt the missile defense program will have its share of failures, as well as successes. I would remind my colleagues that very few programs are strengthened by deep funding reductions. While the challenge of producing effective missile defense is daunting, I would also remind my colleagues of the statement by our committee chairman, "do I believe we can achieve an operationally effective national missile defense system?" and his answer was, "I do."

Finally, I understand that the chairman's intent is to focus this week's hearing on Missile Defense Agency budget and programs, and next week's hearing on MDA organization and management processes. Mr. Chairman, I will try to abide by your desires. Nevertheless, as MDA management processes are reflected in its programmatic request, we will quite possibly hear criticisms of these processes today as well. I am afraid these criticisms will devolve into a fundamental disagreement that some of our friends on the other side of the aisle may have with the direction of the entire Department of Defense.

The Department is embracing capabilities-based spiral development as a means of putting militarily useful capability into the hands of the warfighter faster than we have in the past. This is an approach based on commercial best practices, and it is endorsed by GAO in studies solicited by this committee.

My colleagues who take issue with capabilities-based spiral development may find themselves in the awkward position of endorsing the old Pentagon acquisition system, complete with a rigid, demanding requirements process that leads to concurrent development of systems and technology, high technical risk, schedule delays, cost increases, and weapons-systems cycle times measured in decades—a system that for years this committee has sought to improve.

The capabilities-based spiral development approach, as I understand it, is intended to be an incremental, disciplined, and realistic approach to the development and deployment of weapons systems. As it pertains to the Missile Defense Agency, the process is not devoid of oversight by the Office of the Secretary of Defense, and will not deny Congress insight into missile defense project activity, but these are not issues unique to the missile defense program.

I am grateful that we have Secretary Aldridge with us today, and next week as well, to deal with these Department of Defense acquisition issues. I know I have taken more time than usual for my statement, Mr. Chairman. I thank you and the members of the

subcommittee for their patience. Again, welcome to the witnesses, and I look forward to hearing your testimony.

Senator REED. Thank you, Senator Allard.

As Senator Allard indicated, we are trying to concentrate in this hearing on the budget applications and in the next hearing on management. With that, Senator Byrd, do you have a statement?

Senator BYRD. I do not have a statement, Mr. Chairman. I have some questions. Shall I wait?

Senator BILL NELSON. Mr. Chairman, I have a 25-minute opening statement. [Laughter.]

Senator REED. Senator Nelson, forgive me. Go ahead.

Senator ALLARD. Mr. Chairman, I do not know the nature of Senator Byrd's questions, but I wonder if maybe we should not hear the testimony from the witnesses first.

Senator REED. I understand that. I thought the Senator might have questions that he would make in lieu of the statements. Obviously, we will wait until after the statements.

General Kadish, your testimony, or Secretary Aldridge. Who prefers to go first?

STATEMENT OF HON. E.C. "PETE" ALDRIDGE, UNDER SECRETARY OF DEFENSE FOR ACQUISITION, TECHNOLOGY, AND LOGISTICS

Secretary ALDRIDGE. Mr. Chairman, I will go first if you do not mind.

Mr. Chairman, Ranking Member Allard, members of the subcommittee, Senator Byrd, Senator Nelson, it is an honor to have the opportunity to appear before this subcommittee to discuss the President's fiscal year 2003 defense budget request as it pertains to ballistic missile defense. I am most fortunate to be here today with Lieutenant General Kadish, Director of the Missile Defense Agency and, consistent with his newly defined authority, I will defer questions on program and budget to him. I have read his written testimony and fully endorse it.

Because the hearing on acquisition policy and oversight will be held next week, I will be pleased to provide written testimony on those topics at that time. I have a very short opening oral statement today, sir.

Last year, the President announced our intention to withdraw from the Antiballistic Missile (ABM) Treaty. He observed the self-evident fact that our greatest threats no longer come from Russia but from terrorists who strike without warning, or rogue states who seek weapons of mass destruction. He also said that these new enemies actively seek the ability to deliver death and destruction to our doorstep via a missile.

The four priorities of our missile defense program speak to these dangers. They are: (1) to defend the United States, deployed forces, allies, and friends from ballistic missile attack; (2) to employ a ballistic missile system that layers defenses to intercept missiles in all phases of their flight, i.e., boost, midcourse, and terminal, and against all ranges of threats; (3) to enable the military departments to field elements of the other ballistic missile defense systems as soon as practicable; and (4) to develop and test technologies, use prototypes, and test assets to provide early capability, if necessary,

and improve the effectiveness of deployed capability by inserting new technologies as they become available, or when the threat warrants an accelerated capability.

These objectives are challenging, but by no means impossible. We have experienced significant and meaningful successes in hit-to-kill technologies, the latest generation Patriot missile, and the Airborne Laser (ABL) program. We have also had some problems, as should be expected in any effort to develop new kinds of technology to counter new kinds of threats.

As for my role as the defense acquisition executive, let me just say that the starting point for further testing and implementation successes is this fiscal year 2003 budget. I have every confidence that it will advance our efforts as we work to solve these technical challenges and to mitigate these very real threats.

I would like to turn the floor over to General Kadish, and if you desire, we can respond to questions after his testimony.

Senator REED. Thank you, Mr. Secretary.

General Kadish.

STATEMENT OF LT. GEN. RONALD T. KADISH, USAF, DIRECTOR, MISSILE DEFENSE AGENCY

General KADISH. Mr. Chairman, it is a pleasure to be here today to explain our fiscal year 2003 missile defense budget. To allow more time for questions, I would like my prepared statement entered into the record. We have made considerable progress in our programs since I last testified, and we spent the past year testing key technologies and their integration, and restructuring our program to better address the challenges we face.

Since I will be here next week to address some of the changes in our restructured program, I will confine my remarks this afternoon to testing. I would like to provide a quick video report card, as awkward as it is in this forum, on the moneys that were spent last year and this fiscal year on our test results. I would also like to discuss the objectives of the missile defense program. Those objectives that Secretary Aldridge has outlined have not changed.

Our goal is to develop a single integrated ballistic missile defense system to defend the populations and forces of the United States, its allies, and friends against all types and ranges of missiles. Based on the results of last year's missile defense review, the Department has moved away from an independently managed element-centric approach and established a single program to develop an integrated system.

This system will consist of elements configured in layered defenses for integrated and autonomous operations and mutual support. This will give us multiple engagement opportunities, along the threat missile's flight path in boost, midcourse, and terminal phases. Our testing program is currently focused on individual elements, their performance within the proposed BMD System, and their testing is certainly gaining momentum. We conduct many kinds and levels of tests during the development of this technology, including models and simulations, ground testing, risk reduction flights, intercept flights, and system-wide tests and exercises. We have done almost a test a month since I was here last summer, and

we expect to stay at least on that pace this year, testing in a very aggressive way.

Now, with your indulgence, I would like to show a relatively short film, a little over 8 minutes long on our test results last year.

[The information referred to follows:]

[Copy retained in committee files.]

It will include some ground testing of the Airborne Laser, as well as some flight testing of all the different activities that we have. It will also show some of our failures this past year.

What you will see here in the beginning is a description of the types of threat missiles we face, and the time span is from January 2001 through January 2002. You can see the layered defenses and the way the threat missiles are constructed. I would like to just point out right now you have boost phase, when it is boosting, midcourse, when it is coasting to the target, and terminal, when it is actually attacking the target, and you get long-range, medium-range, and short-range threats. No one system as we currently understand it can attack in each one of those phases.

The first test is a ground test of the Airborne Laser, which is in the boost phase of the attack, and we had something called first light, and what you are going to see here is not very spectacular, but it is to an engineer. It is the actual heating up of the surfaces of the different lenses of the laser, and we got significant performance out of that laser the first time we lit it up, so that is on track.

We had a Patriot test, and this was very complex. We shot two Patriot 3s and one Patriot 2 at incoming missiles, and you can see the Patriots, both the 3 and 2, actually doing the intercepts.

Now, we have had some failures in Patriot, as was noted in your opening remarks, Senator Reed, but I believe that those are at the edge of the envelope, and we will be able to structure those tests in the future to be effective.

I also include Arrow here, because we spent a considerable amount of investment in the Arrow system, and we did a test of the Arrow, which is a system in the terminal phase against shorter-range missiles. The target was launched from an F–15 off the coast of Israel, and you will see the Arrow rising to the intercept point.

This is a blast fragmentation warhead, but is almost accurate enough to be hit-to-kill. The crosshairs are on the Arrow interceptor rising to meet the target, and you can see the target there, and it was destroyed, so the investment in Arrow was and continues to be fairly effective.

Now I would like to talk about a non-intercept test against long-range missiles in the midcourse, where we are developing the booster to actually boost to kill vehicles. We have done two tests of this technology, one last August and one in December. This is the August test, and this is basically the booster, the rocket stack, if you will. It was successful. We did not have any intercept tied to it, but that encouraged us.

As you might recall, we were behind in this development, and this test was pretty effective. However, in December of this past year we did another test just of the booster without an interceptor attached to increase our confidence, and to our chagrin we were not

successful in this test. I would like to show you what an unsuccessful booster test looks like.

This is about 13 seconds into flight. As you can see, it will self-destruct, basically, in the process, and then tumble to Earth. We believe we know what caused that. That is why we do testing, and we will fix it in the process.

Now I would like to talk about the two ground-based tests we have done. They are identical. We are three-for-five in these types of tests. The last two were successful. This was the one done in July last year. You can see the interceptor rising to meet the target that was launched from Vandenberg Air Force Base, about 4,800 miles away, and the intercept occurred about 140 miles into space, and this is a view that we have not shown you before of the actual interceptor video as it came in and hit the target.

This is another view from a different sensor, and the radar track on the right confirmed the actual intercept.

The test we did after that was in December. We are starting to build a track record on this. It was identical to the one we did in July to confirm our confidence in the hit-to-kill technology. I will note that we have the next one scheduled for March 15 of this year and right now we are just a few days away from that intercept test.

Again, the target launched from Vandenberg and the interceptor from the South Pacific, and it rose to meet the target, and you can see the things the seeker saw. This is the way it approached the actual target at 7½ kilometers per second. That is the last thing you saw before it hit, and we confirmed the actual intercept through other sensors, and you can see that here.

Now, I am pleased to show the first sea-based intercept by a standard missile. This is in the midcourse against medium or intermediate-range missiles. It is done from an Aegis cruiser. We did this test twice, once last year, and we did not have an intercept attempt, it basically flew by the target to gather data, and that is what this shows right here. This is a fly-by. We were going to do it again this January, a year later, but we were able to get the missile in such a position that it actually intercepted the missile that you will see here in a minute, although that was not the primary objective of the test.

The target was launched out of Kawai in the Hawaiian Islands, an intermediate-range target. The Aegis cruiser with a standard missile was about 450 kilometers away. You can see the launch of the standard missile to rise and meet that missile in outer space, a very exciting launch from that standpoint. This is what the kill vehicle actually saw as it was coming in for the intercept, so you can see how accurate we are getting in the overall approach that we are using.

So that video report card shows how we have been spending the money Congress has allocated to us over the past year to year-and-a-half, and you can see, our tests were some obvious successes and some failures, but from a testing point of view we learn a lot from our failures as well.

Both the pace and complexity of our testing are going to pick up, and we will have 12 more flight tests scheduled for the remainder of this fiscal year, together with 14 ground tests and 13 system-wide tests.

Now, just a brief word about the budget. As you pointed out, the fiscal year 2003 budget is substantial, but it continues in the same range as last year to provide us the stability we need in this aggressive development program, and in so doing it supports our program objectives. We have asked for a total of $6.7 billion for fiscal year 2003, which is slightly less than last year. This amount reflects the decision by the Department to transfer to the Army all the funding for fiscal years 2003 to 2007 for Patriot 3 and the other program called MEADS.

We plan to continue PAC–3 operational testing in our development of THAAD and ground and sea-based midcourse defense as well as the Airborne Laser. I expect that experimental work, especially in the area of boost-phase defense, will continue aggressively, and our 2003 funding will help us reach our goal for initial test bed capability for the ground-based system by calendar year 2004.

In the interest of time, Mr. Chairman, I will conclude my remarks. The details of our program have been provided to you and the rest of the members and staff. Over the past year, we have made some significant strides in our development, as some of our major test events have shown, yet we also have some significant challenges ahead to ensure our missile defenses will become effective as soon as possible, and will remain so throughout their life. With your continued support and that of the American people, I have every confidence we can do it.

Thank you, Mr. Chairman.

[The prepared statement of General Kadish follows:]

PREPARED STATEMENT BY LT. GEN. RONALD T. KADISH, USAF

Good morning. It is a pleasure to appear before you today to present the Department of Defense's fiscal year 2003 missile defense program and budget.

The Department of Defense is developing effective missile defenses for the territories and deployed forces of the United States, allies, and friends. Ballistic missiles already pose a threat to the United States and to U.S. interests, forces, allies, and friends. The missiles possessed by potential adversaries are growing in range, reliability, and accuracy. The proliferation of ballistic missile technologies, materials, and expertise can also occur in unexpected ways, enabling potential adversaries to accelerate missile development or quickly acquire new capabilities. Missiles carrying nuclear, biological, or chemical weapons could inflict damage that far surpasses what we experienced last September 11. The events of that day underscored the vulnerability of our homeland, even to assault from distant regions.

Defensive capabilities to counter this threat cannot be deployed overnight. We also recognize that the threat is continually changing. So we are taking an approach to build missile defenses that will allow us to put capabilities "in play" as soon as practicable to provide the best defenses possible against the projected threat, based on technological progress and success in testing. After nearly a decade of steady developmental progress, we are deploying the first Patriot Advanced Capability-3, or PAC–3, missiles to give our forces protection against short-range threats. In the coming years we plan to introduce new capabilities to defeat medium- and even longer-range ballistic missiles.

Over the past year, we have made considerable progress in demonstrating key missile defense technologies and integration concepts. This past January we took a significant step forward and broke new ground with the successful midcourse intercept of a medium-range ballistic missile target using a sea-based interceptor. Following successful intercepts of long-range targets in July and December of last year, we gained further confidence in our Ground-based Midcourse Defense (GMD) design and capability. With the Airborne Laser, or ABL, we are making steady progress in the development of directed energy technologies by achieving record power levels in the last two tests and successfully completing the final lasing test for Laser Module-1.

Some of our tests showed we need more work to achieve our design objectives. The third test late last year of the boost vehicle under development for the GMD

element failed to launch as planned. Because a faster ground-based interceptor will increase significantly our engagement envelope, we are focusing intently to resolve the associated development problems. Recently, PAC–3 began a series of operational tests. In mid-February, PAC–3 teamed up with PAC–2 in a multiple simultaneous engagement test to intercept three air-breathing targets, but intercepted just one. Despite some setbacks, we continue to make remarkable strides, Mr. Chairman, and we grow increasingly confident in our ability to deliver effective missile defense capabilities over the next few years. Yet, we should all recognize that there remains a long road ahead.

APPROACH TO MISSILE DEFENSE

The Missile Defense Agency (MDA) will develop incrementally a Ballistic Missile Defense (BMD) System that layers defenses to intercept ballistic missiles of all ranges in all phases of flight—boost, midcourse, and terminal.[1] These increments will be transferred to the Services for production and deployment as soon as practicable. We are working with the warfighters, the CINCs, and the Services throughout this process.

Based on the results of last year's rigorous missile defense review, the Department has moved away from an independently managed, element-centric approach and established a single program to develop an integrated BMD System. The BMD System will consist of elements configured into layered defenses to provide autonomous and mutual support, including multiple engagement opportunities, along a threat missile's flight path. The missile defense program supports numerous risk reduction activities, including flight tests, ground simulations, and hardware-in-the-loop demonstrations.

Engineering complexities and operational realities associated with missile defense require operational and system integration as well as an ability to operate elements autonomously. Therefore, a key tenet of the missile defense program is robust, realistic testing within the BMD System Test Bed. This Test Bed is an integrated set of components that are widely dispersed among operationally realistic locations primarily throughout the Pacific and continental United States. While its specific components have independent utility, the Test Bed is designed to support development of missile defense elements and demonstrate an integrated, layered missile defense system. We will use the Test Bed over the next few years to validate the midcourse, boost, and terminal elements, including supporting sensors, and the necessary BM/C^2 and communications components. This Test Bed was most recently used to test the Standard Missile-3 interceptor for Sea-based Midcourse Defense (SMD) and in fiscal year 2002 it will host additional GMD and SMD intercept flight tests and a major System Integration Test.

The BMD System Test Bed includes prototypes and surrogates of the System elements as well as supporting test infrastructure to provide trajectory, sensing, interception, and BM/C^2 and communication scenarios that resemble conditions under which the system might be expected to operate. It will enable testing against faster, longer-range target missiles than we are using today, and it will allow us to test using different geometric, operational, and element configurations.

As they become available, we could use prototypes and test assets to provide early capability, if so directed. A decision to employ test assets would depend upon the success of testing, the appropriate positioning of Test Bed components, the availability of test interceptors and other assets, and the international security environment. Our test infrastructure, in other words, will have an inherent, though rudimentary, operational capability.

Our program is now entering a new phase, moving from technology development to system engineering, and we face a very significant challenge of integrating many diverse elements into one system. We employ thousands of individuals throughout the United States. We are also collaborating extensively with all of the Military Departments and the Joint Staff as we investigate different basing modes and deal with associated operational and planning challenges. Our approach to managing resources is clearly an important element of our approach to missile defense. This committee's support for the President's Freedom to Manage Initiative will reduce statutory requirements that can restrict management flexibility, allowing us to more efficiently and effectively execute the Missile Defense program.

[1] On January 2, 2002, the Secretary of Defense established the Missile Defense Agency to manage the development of effective missile defenses.

ACQUISITION STRATEGY

The BMD System is highly complex, so we are using an acquisition approach that capitalizes on advances in missile defense technology and continually adjusts to changes in external factors (e.g., threat, policy, and priorities) as appropriate. We are following an aggressive research, development, test, and evaluation (RDT&E) acquisition strategy that allows us to respond to changes in the threat, manages changes in system technologies, and ensures progress in development and testing.

The BMD System architecture will take shape based on periodic decisions and assessments within the MDA and the Department's Senior Executive Council (SEC). Annual assessments will include evaluations of element test performance, system architecture, technological and basing alternatives, and the threat. The initial goal is to provide limited protection against long-range threats for the United States and potentially our allies within the 2004–2008 timeframe, while delivering more advanced capabilities against shorter-range threats.

The traditional requirements process has not worked well for missile defense. Missile defense is a cutting-edge development effort and an area where we have very little operational experience. The requirements definition process typically leverages operational experience to set system specifications many years before actual deployment, a process that can lead to a less than optimum deployed capability that does not take advantage of the most advanced technologies.

Let me illustrate what I mean. The B–52 bomber that first flew in 1952 is hardly the same aircraft that dropped bombs over Afghanistan in the war against terrorism. The original B–52 design, which gave us an early intercontinental bombardment capability, was enhanced over time through hardware and software improvements to meet evolving operational challenges. It may look the same, but today's B–52 is a very different aircraft.

Similarly, we enhanced over many years the Patriot batteries we saw in the 1991 Gulf War. Although its capability to defend small areas was improved during Operation Desert Shield, performance against Iraqi Scuds was not impressive. As a result, the Department initiated a follow-on enhancement program and replaced the original missile with a completely new interceptor.

These examples illustrate that in today's dynamic security environment, a requirement written in a system's development phase can quickly become irrelevant or a one-way street that leads developers into a technological cul-de-sac. Five years ago, nobody could have written a requirement for today's Internet and gotten it exactly right.

We, therefore, have modified our acquisition approach. In line with the Secretary's decision to cancel the current Operational Requirements Documents (ORDs) related to missile defense, we are using the ORDs as reference documents, but not as the final measures of development progress. Instead of developing a system in response to a clearly defined threat from a known adversary, we are looking at missile capabilities that any adversary could have in a given timeframe. We also continually assess missile defense technology options and availability. Using a capability-based approach to ensure that a militarily useful BMD System can be deployed as soon as practicable, we are setting initial capability standards and engaging the CINCs, Services, and industry. This acquisition approach supports the effective engineering and integration of the BMD System and ensures a transition of effective, threat-relevant system capabilities to the Services for production, deployment, and operations.

While we are moving away from some of the rigidities associated with the traditional acquisition process, we are not abandoning discipline in development. Capability-based acquisition requires continual assessment of technical and operational alternatives at the element and BMD System levels. We will build what we can technologically, and improve it as rapidly as possible. Configuration management and risk management will continue to guide the engineering processes.

In a capability-based approach that pursues parallel development paths, a risk management program is essential. To execute BMDS level risk management, we are identifying risk issues and an analytical basis for modifications and enhancements. This disciplined risk management process supports the annual review and assessment of the BMD System and accommodates significant user participation at the appropriate times during development.

The missile defense acquisition strategy engineers and tests the system using a 2-year capability "block" approach, with the initial introduction of elements into the expanded Test Bed starting as early as fiscal year 2004. The initial BMD System capability (Block 2004) will evolve as technologies mature and are demonstrated satisfactorily in the BMD System Test Bed. This capability will be increased incrementally in future blocks through the introduction of new sensor and weapon components, and by augmenting or upgrading existing capabilities.

Each BMD System Block is comprised of selected element configurations integrated into the overall System BM/C2. There will be annual decision points at which time assessments will be made on the basis of: effectiveness and synergy within the system; technical risk; deployment schedule; cost; and threat. This assessment of progress will determine whether a given developmental activity will be accelerated, modified, or terminated. Implementing changes expeditiously and prudently maximizes value from our investments and allow more rapid program adjustments based on threat projections and technological progress.

Each subsequent block will build on and be integrated into the capabilities provided by predecessor blocks that make up the BMD System. This evolutionary strategy allows us to put the high performance technologies "in play" sooner than would otherwise be possible. Once they have been demonstrated, elements or their components will be available for emergency use, if directed, or for transfer to the Military Departments for production as part of a standard acquisition program.

PROGRAM DESCRIPTION

Our approach to developing missile defenses builds on the technological, engineering, and integration progress we have made to date. We are currently pursuing parallel development efforts in order to reduce risk in the individual RDT&E efforts and aggressively demonstrating technologies for integration on land, sea, air, and space-based elements. When a capability is sufficiently validated, that element or component will be ready for a decision regarding transition to production.

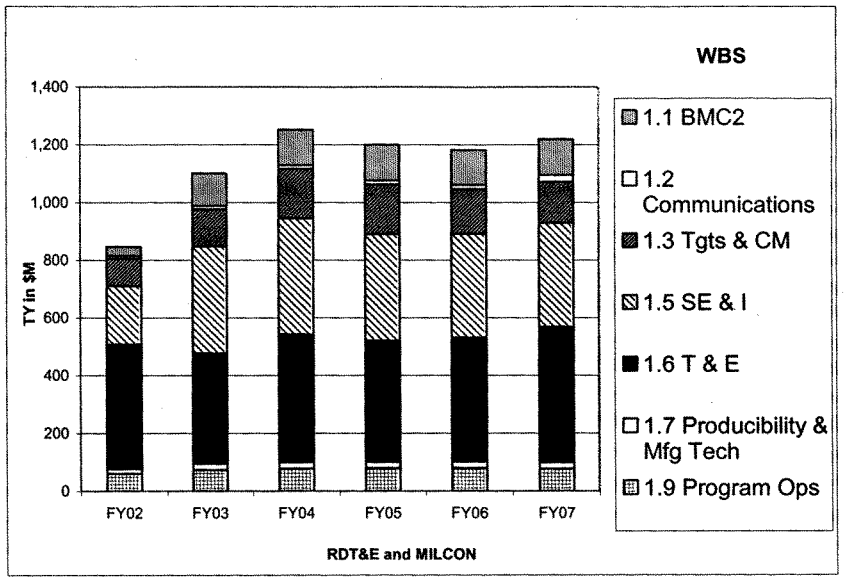
We are also exploring new concepts and experiments for the development of advanced sensor suites and kinetic and directed energy kill mechanisms for potential sea, ground, air, and space deployment. In line with our disciplined walk-before-you-run, learn-as-you-go approach to testing, we are incorporating more realistic scenarios and countermeasures into the missile defense development test program. The Test Bed will be expanded to accommodate this aggressive and robust testing approach.

FY03 Budget Allocation by Work Breakdown Structure (TY $Million)*

WBS	FY02	FY03	FY04	FY05	FY06	FY07
1.0 BMDS	846	1,101	1,252	1,200	1,182	1,219
2.0 Terminal Defense Segment	2,026	1,128	927	1,078	1,149	1,499
3.0 Midcourse Defense Segment	3,762	3,193	3,074	3,016	2,969	2,596
4.0 Boost Defense Segment	600	797	1,390	1,400	1,591	2,275
5.0 Sensor Segment	335	373	489	1,146	900	1,008
6.0 Technology	139	122	155	130	143	147
MDA Total	7,709	6,714	7,287	7,970	7,934	8,743

The Missile Defense Program allocates resources required for the BMD System, including the integration of individual elements into a single, synergistic system to defend the territories and deployed forces of the United States, allies, and friends. The BMD System segment comprises System Engineering and Integration (SE&I), BM/C2, communications, targets and countermeasures, test and evaluation, producibility and manufacturing technology, and program operations (which includes Management Headquarters and the Pentagon Reservation). Funding in this segment provides resources to define, select, test, integrate, and demonstrate the elements in the Terminal Defense, Midcourse Defense, Boost Defense, and Sensor segments. The tasks included in this segment are those that will benefit the entire BMD System, not just a particular element or program. This segment also includes management efforts to ensure architectural consistency and integration of missile defense elements within the overarching missile defense mission.

The President's budget requests $1.1 billion in fiscal year 2003 for RDT&E in the BMD Segment, an increase of $255 million over the fiscal year 2002 enacted funding level. RDT&E and military construction funding in this segment across the fiscal years 2003–2007 FYDP is about $6.0 billion.



As the central engineering component within MDA, the Systems Engineering and Integration activity provides the overall system engineering development and integration of the BMD System. SE&I activities will define and manage the layered BMD System collaboratively by providing detailed systems engineering and integration across the entire spectrum of system capabilities. Capability-based acquisition requires continual assessment of technical and operational alternatives at the component, element, and system levels. The systems engineering process involves setting BMD System Technical Objectives and Goals; addressing existing, emerging, and postulated adversary capabilities; assessing and determining system design and element contributions; synthesizing system blocks; introducing new technologies and operational concepts; conducting system risk analyses; and considering impacts of potential foreign contributions to BMD System capabilities.

The BM/C^2 activity will develop and integrate the BM/C^2 and communications functions for the BMD System. To provide maximum flexibility to the warfighter, this activity includes the development of specifications needed to ensure Terminal Defense, Midcourse Defense, Boost Defense, and Sensor segments are properly integrated and interoperable with external systems, to include those of allies. Communications funding consolidates and refines BMD System-wide communication links to allow components of the BMD System to exchange data and to permit command and control orders to be transmitted to weapons and sensors.

The Targets and Countermeasures program provides capability-based ballistic missile targets, countermeasures, and other payloads to support system-testing as well as element testing across the segments. Standard interfaces are being defined between payloads and boosters, so that we can introduce different targets into BMD System flight test scenarios with greater efficiency. Beginning in fiscal year 2002, we are establishing an inventory of target modules (boosters, reentry-vehicles, countermeasures, and instrumentation) to shorten the build-cycle and support more frequent flight tests.

The Test and Evaluation program includes the test and evaluation infrastructure, tools for program-wide use, and execution of system-level testing. Individual BMD System elements will conduct risk reduction, developmental, and operational testing. System level tests go beyond these, testing synergy, interoperability, BM/C^2 and communication links across the elements. Also resourced are those tests conducted for the purpose of making critical measurements required across the missile defense regime, for example, measurements of adversary missile characteristics such as plume signatures, lethality measurements, and characterization of potential countermeasures. Such data collection becomes an important input to the design and development of effective defenses.

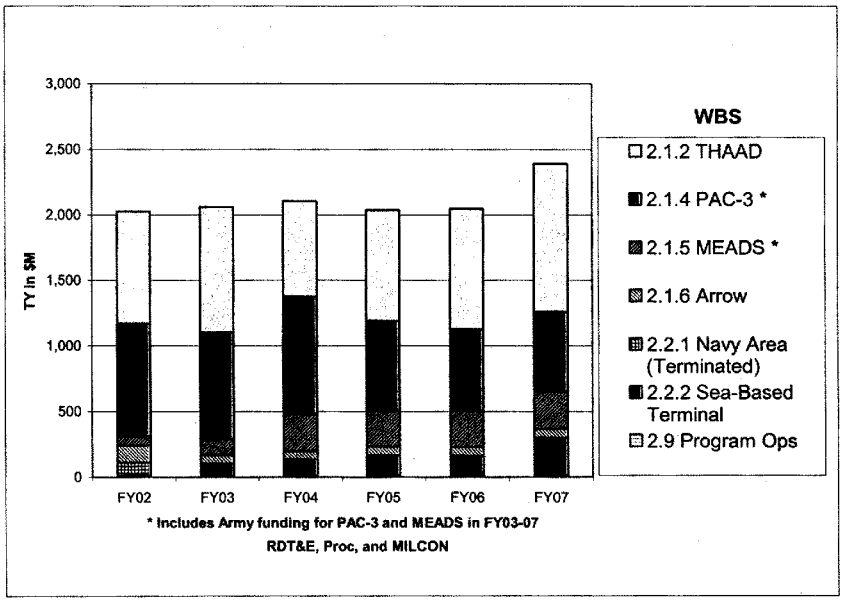
Supporting robust, realistic testing requires a significant investment in the development and maintenance of the requisite test infrastructure, analytical tools, and computational capabilities. Because this supports both the system and all of its elements, it is resourced centrally at the system level. The BMD System test infrastructure includes a number of critical, specialized ground test facilities, test range facilities, launch capabilities, and instrumentation, such as several airborne sensor platforms and other mobile capabilities unique to missile defense testing. Core models and simulations, both for engineering and integration purposes, are also developed, validated, and maintained. These range from detailed phenomenology and lethality codes used by all the system elements to large-scale wargaming simulations required for BM/C^2 and operational concept of operations development. A number of computational facilities, data libraries, and simulation facilities are also resourced at the System level.

Terminal Defense Segment (TDS)

The Terminal Defense Segment involves development and upgrades of missile defense capabilities that engage short- to medium-range ballistic missiles in the terminal phase of their trajectory. The missile or warhead enters the terminal phase when it reenters the atmosphere. This is a short phase, lasting less than a minute. Elements in this defense segment include Theater High Altitude Area Defense (THAAD), PATRIOT Advanced Capability Level 3 (PAC–3), Medium Extended Air Defense System (MEADS), and a sea-based terminal concept definition element (successor to the Navy Area activities). Additionally, other elements funded by the MDA are the Israeli Arrow Deployability Program, which includes the Israeli Test Bed (ITB), Arrow System Improvement Program, and studies via the Israeli Systems Architecture and Integration effort.

The MDA budget allocation for TDS activities in fiscal year 2003 is $1.1 billion, which includes funds for RDT&E and military construction. The MDA budget includes about $5.8 billion in fiscal year 2003–2007 for the terminal defense segment. These figures reflect a decision by the Department to transfer to the Army all funding for PAC–3 and MEADS from fiscal year 2003 to fiscal year 2007.

Congress returned PAC–3 and MEADS to MDA for fiscal year 2002 pending the fulfillment of congressionally mandated requirements. Upon satisfaction of all congressional directives, we will transfer the PAC–3 to the Army.



TDS Elements

THAAD is designed to defend against short- to medium-range ballistic missiles at endo- and exo-atmospheric altitudes, which can make effective countermeasures against THAAD difficult to employ. It also allows multiple intercept opportunities, and can significantly mitigate the effects of weapons of mass destruction. THAAD will protect forward-deployed U.S. and allied armed forces, broadly dispersed assets, and population centers against missile attacks.

In fiscal year 2003, we will complete missile and launcher designs and initiate manufacturing of missile ground test units, continue fabrication of the first and second radars, and continue to fabricate and test the BM/C^2 hardware and software. We will support robust ground-testing and flight-hardware testing in preparation for missile flights in fiscal year 2004 at the White Sands Missile Range. The element development phase will refine and mature the THAAD design to ensure component and element performance, producibility, and supportability. There are five major THAAD components: missiles, launchers, radars, BM/C^2, and THAAD-specific support equipment.

PAC–3 provides terminal missile defense capability to protect U.S. forward-deployed forces, allies, and friends. PAC–3 can counter enemy short-range ballistic missiles, anti-radiation missiles, and aircraft employing advanced countermeasures and a low radar cross-section. PAC–3 successfully completed development testing last year, during which there were three intercepts of ballistic missiles, two cruise missile intercepts, and four multiple simultaneous engagements of ballistic and cruise missiles. The start of PAC–3 operational testing in February 2002 shows that we still have work to do. In fiscal year 2003, we will execute activity to develop, integrate, and test evolutionary block upgrades. Plans include transitioning PAC–3 to full rate production to build up PAC–3 missile inventory and field additional PAC–3 capabilities.

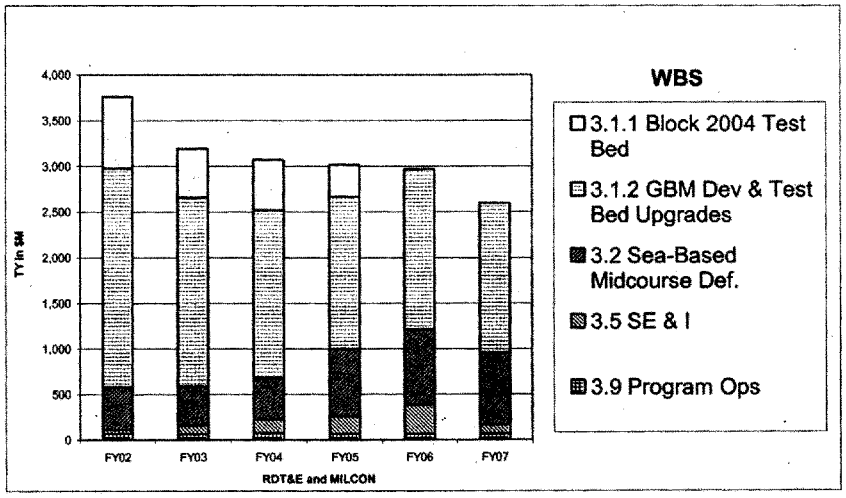
The Department decided in December 2001 to cancel the Navy Area program after a Nunn-McCurdy breach. Nonetheless, the need for timely development and deployment of a sea-based terminal ballistic missile defense capability remains. We have initiated the sea-based terminal study directed by the Department, which we expect to conclude this spring.

MEADS is a cooperative effort between the U.S., Germany, and Italy. MEADS will provide robust, 360-degree protection for maneuver forces and other critical forward-deployed assets against short- and medium-range missiles and air-breathing threats, such as cruise missiles and aircraft. In fiscal year 2001, the trilateral MEADS activity embarked on a 3-year risk reduction effort. In fiscal year 2003, MEADS will continue design and development activities for key system components, which includes efforts to integrate the PAC–3 missile with MEADS.

The Arrow Weapon System (AWS), developed jointly by the United States and Israel, provides Israel a capability to defend against short- to medium-range ballistic missiles. The Arrow Deployability Program allows for Israel's acquisition of a third Arrow battery and Arrow's interoperability with U.S. systems. The Arrow System Improvement Program will include both technical cooperation to improve the performance of the AWS and a cooperative test and evaluation program to validate the improved AWS performance. We will support additional flight testing and supply of components for additional missiles to be built in Israel. Continued U.S. cooperation with Israel will provide insight to Israeli technologies, which may be used to enhance U.S. ballistic missile defenses.

Midcourse Defense Segment (MDS)

Midcourse Defense Segment elements engage threat ballistic missiles in the exo-atmosphere after booster burnout and before the warhead re-enters the Earth's atmosphere. The Ground-based Midcourse Defense and Sea-Based Midcourse Defense elements of the MDS are the successors to the National Missile Defense and Navy Theater Wide programs, respectively. The Sea-based Midcourse activity includes a cooperative missile technology development effort with Japan. Our budget for this segment in fiscal year 2003 (RDT&E and military construction) is almost $3.2 billion, or $570 million less than the funding enacted for fiscal year 2002. MDS funding is about $14.8 billion across the FYDP.



MDS Elements

The Ground-based Midcourse Defense (GMD) will engage threat missiles primarily during the descent phase of midcourse flight. Our GMD development activity has three main objectives: (1) demonstrate hit-to-kill; (2) develop and demonstrate an integrated system capable of countering known and expected long-range threats; and (3) develop infrastructure and assets for the initial GMD components of the BMD System Test Bed to conduct realistic tests using operationally representative hardware and software and produce reliable data for GMD and BMD System development.

During fiscal year 2002, the GMD element will build upon the successful intercept tests of July and December 2001 by further demonstrating hit-to-kill and discrimination capabilities using increasingly complex and realistic test scenarios. Development of the 2004 BMD System Test Bed continues with an upgraded Cobra-Dane radar in Alaska as a temporary surrogate for Upgraded Early Warning Radars (UEWRs); an accelerated version of the In-Flight Interceptor Communications System (IFICS) and Battle Management, Command, Control and Communications (BMC3) capability; five "common" silos with sparing; Command Launch Equipment (CLE); and software upgrades.

In fiscal year 2003 five Ground-Based Interceptors using a precursor of the objective booster and an operationally representative kill vehicle will be developed for installation and testing in fiscal year 2004. MDA will continue to develop the objective booster and continue with the complementary EKV activity. This objective may allow for a common EKV for Ground and Sea-based Midcourse Defenses. BM/C^2 and communications incremental prototypes will be integrated and demonstrated at multiple locations and assessed with user participation. The Prototype Manufacturing Rate Facility will continue in fiscal year 2003 to support a wide range of interceptor needs for the increased rate of flight tests. Research and development efforts for Block 2004 and subsequent blocks will support the development of the initial GMD parts of the Block 2004 BMD System Test Bed. This facility will also support continued development and testing of more-capable interceptors, sensors, and targets.

Sea-based Midcourse Defense will develop a ship-based capability to intercept threat missiles early in the ascent phase of midcourse flight. SMD continues to build upon the existing Aegis Weapons System and Aegis Light-weight Exo-Atmospheric Projectile (LEAP) Intercept (ALI) activities while pursuing alternative kinetic warhead technologies.

In January 2002, we conducted the first of many flight tests for the Standard Missile 3 (SM–3) in order to demonstrate kill vehicle guidance, navigation, and control against a live ballistic missile target. The SM–3 launched from the U.S.S. *Lake Erie,* which was positioned in the BMD System Test Bed more than 500 kilometers away from the Pacific Missile Range Facility, and successfully collided with its target mis-

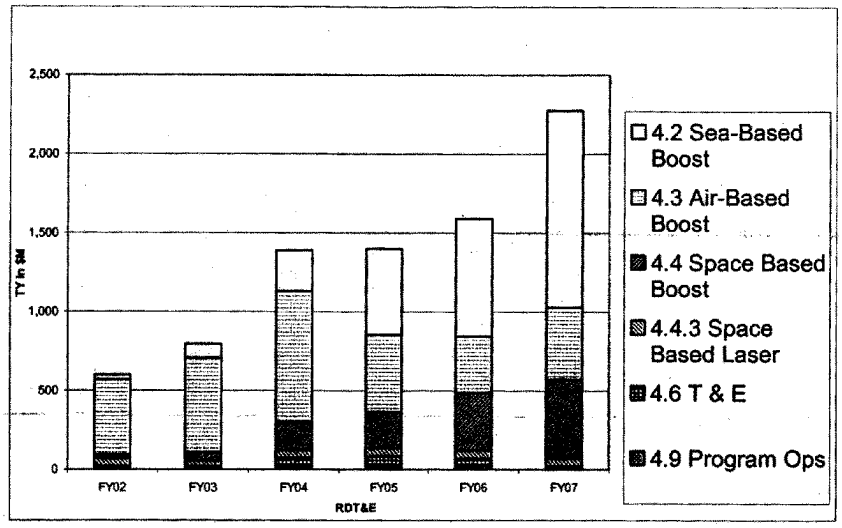
sile in space using infrared sensors. This was the first intercept for the hit-to-kill SMD element.

Funding in fiscal year 2003 continues for concept definition, risk reduction, and testing to further the development of a capability to defeat medium- to intermediate-range threats. The SMD project has three primary objectives in fiscal year 2003: (1) continue testing and complete ALI Flight Demonstration Project; (2) design and develop a contingency ship-based ascent and midcourse ballistic missile intercept capability based on ALI and associated technologies; and (3) continue an effort initiated in fiscal year 2002 to provide a ship-based missile defense system designed to provide an ascent midcourse phase "hit-to-kill" technology in the fiscal years 2008–2010 timeframe.

The United States and Japan, under a 1999 Memorandum of Understanding, are conducting a cooperative systems engineering project to design advanced missile components for possible integration into the SMD element. This project leverages the established and demonstrated industrial and engineering strengths of Japan and allows a significant degree of cost sharing.

Boost Defense Segment (BDS)

The Boost Defense Segment addresses both directed energy and kinetic energy (KE) boost phase intercept (BPI) missile defense capabilities to create a defense layer near the hostile missile's launch point. To engage ballistic missiles in this phase, quick reaction times, high confidence decision-making, and multiple engagement capabilities are desired. The development of high-power lasers and faster interceptor capabilities are required to engineer kinetic and directed energy capabilities to provide options for multiple shot opportunities and basing modes in different geographic environments. MDA RDT&E funding in the Boost Defense Segment is $797 million in fiscal year 2003, an increase of $197 million over fiscal year 2002 enacted funding, and is approximately $7.5 billion from fiscal year 2003 to fiscal year 2007.



The BDS employs multiple development paths. Information derived from this approach will help evaluate the most promising BPI projects to provide a basis for an architecture decision. The BDS will demonstrate the ABL for the Block 2004 Test Bed. It will define and evolve space-based and sea-based kinetic energy BPI concepts. Also, we will evaluate Space-Based Laser technologies. At the appropriate time, based on mature system concepts and technologies, we will initiate a focused demonstration of this concept in the Test Bed.

BDS Elements

ABL will acquire, track, and kill ballistic missiles in their boost phase of flight. Management and funding responsibility for ABL has officially transferred from the Air Force to the Missile Defense Agency. ABL integrates three major subsystems

(laser; beam control; and battle management, command, control, communications, computers, and intelligence (BM/C^4I)) into a modified commercial Boeing 747–400F aircraft. ABL-specific ground support equipment also will be developed.

Building on successful sub-system testing and the modification of aircraft structures, in fiscal year 2003 we will commence major subsystem integration and testing activities. The ABL Block 2004 phase culminates in a lethality demonstration (missile shoot-down) against boosting ballistic missile threat-representative targets and delivers one aircraft for integration and testing. If directed, this aircraft could also provide an emergency defensive capability. We plan to develop a second test aircraft, which will further develop this new technology.

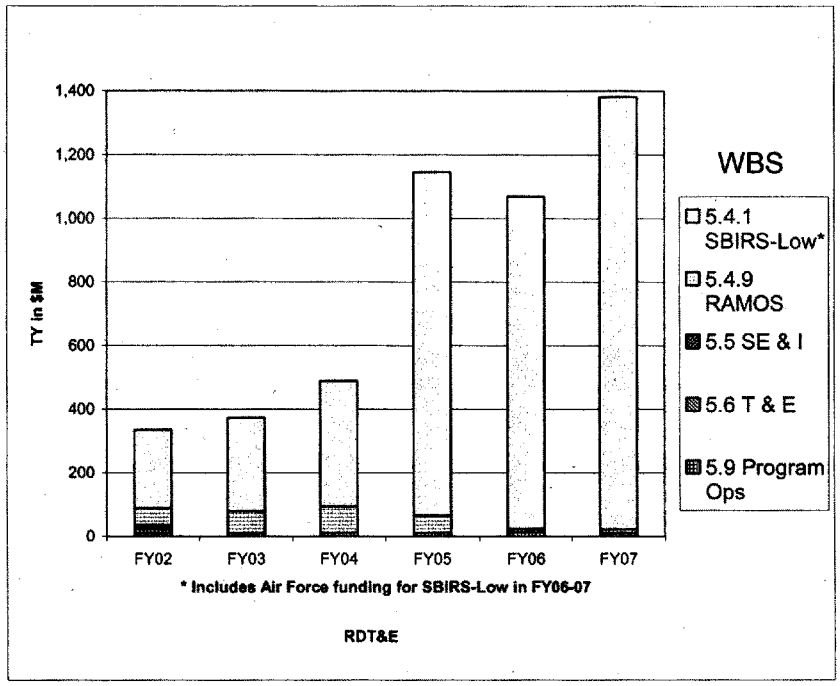
The Kinetic Energy Boost defense activity reduces the technical and programmatic risks of fielding a boost phase intercept capability. The KE Boost strategy is to define and assess militarily useful boost phase concepts, invest in focused risk reduction activities, and execute critical experiments. We will tap the brightest minds in the public and private sectors to define the most effective approach to killing ballistic missiles as they boost. We identified several lucrative technology candidates for immediate investment, including fast burn and flexible axial propulsion technologies, agile kill vehicles, early detection and track sensors, quick-reaction BM/C^2, and affordable weapons platforms. We will assess these component technologies through rigorous ground and flight tests.

We will evaluate prototype component and element configurations under realistic operational conditions. We will experiment using emerging component technologies and test infrastructure to resolve tough technical challenges, such as predicting the point of intercept and finding the missile tank in the presence of hot exhaust. When possible, we will exploit targets of opportunity by tracking space launch vehicles and test missions launched out of Vandenberg, Air Force Base. The test data we collect from our risk reduction work and critical experiments will help guide decisions concerning focused demonstrations in fiscal year 2005.

We are evaluating options for continuing SBL activity. The SBL project involves technology development and risk reduction activities in the key areas of laser output, beam control, and beam director design to demonstrate feasibility of boost phase intercept by a high-energy laser in space. These efforts leverage work started under previous SBL-funded technology development programs.

Sensor Segment

Sensors developed in this segment will have multi-mission capabilities intended to enhance detection of and provide critical tracking information about ballistic missiles in all phases of flight. The fiscal year 2003 budget request for RDT&E in this segment is $373 million, which represents an increase of $38 million over fiscal year 2002 funding. The MDA budget provides $3.9 billion for the sensor segment during fiscal year 2003 to fiscal year 2007.



The Space Based Infrared System-Low (SBIRS-Low) element will incorporate new technologies to enhance detection; improve reporting on ballistic missile launches regardless of range or launch point; and provide critical mid-course tracking and discrimination data for the BMDS. When SBIRS-Low is integrated with other space-based infrared, interceptor, and surface-based radar sensors, the BMD System will have a capability to counter a broad array of midcourse countermeasures. Moreover, SBIRS-Low will not carry many of the risks associated with forward deployed ground-based sensors, which can be vulnerable to attack and for which foreign basing rights must be negotiated.

Per direction in the Fiscal Year 2002 National Defense Appropriations Conference Report, plans for Satellite Sensor Technology, including SBIRS-Low, will be provided to congressional defense committees by May 15, 2002. The restructured SBIRS-Low activity will support numerous risk reduction activities, including technology maturation, ground simulations, and hardware-in-the-loop demonstrations. Based on cost, schedule, capability, and threat assessments, decisions will be made regarding production of a demonstrated SBIRS-Low capability.

The international component of the Sensor Segment is the Russian-American Observation Satellite (RAMOS) project. We are cooperating with the Russian Federation in the area of early warning missile defense technologies. RAMOS is an innovative U.S.-Russian space-based remote sensor research and development initiative that engages Russian early warning satellite developers in the joint definition and execution of aircraft and space experiments.

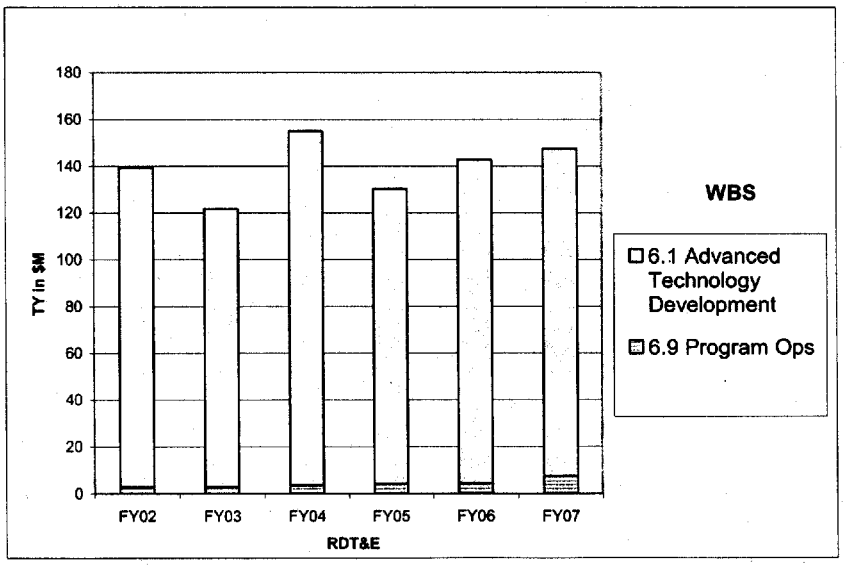
The Russians continue to review the agreement to execute the RAMOS project presented last July by the United States. Assuming agreement is reached this summer, in fiscal year 2003 we will complete detailed designs of the satellites and sensor payloads, begin fabrication and assembly of U.S. sensors and ground support equipment, and continue sensor software and modeling and simulation development. Launches of the first and second RAMOS satellites are projected to occur in fiscal year 2006.

Technology

The Technology effort will develop components, subsystems, and new concepts based on high-risk, high-payoff approaches. The primary focus of this effort is the

development of sensors and weapons for future improved missile defense platforms. Investments maintain a balance between providing block upgrades to current acquisition programs and developing the enabling technologies for radically new concepts.

Our budget for the Technology segment in fiscal year 2003 is $122 million (RDT&E), a reduction of $18 million from fiscal year 2002 enacted level. Funding from fiscal year 2003 to fiscal year 2007 is projected to be about $697 million.



To enable the BMD System to pace the threat, the Advanced Technology Development (ATD) effort is focused in four primary areas: (1) Terminal Missile Defense, (2) Midcourse Counter-Countermeasures, (3) Boost Phase Intercept, and (4) Global Defense. In addition to these tasks, investments are made in a strong technology base to move beyond the state-of-the-art in radars, infrared sensors, lasers, optics, propulsion, wide-band-gap materials, photonic devices, and other innovative concepts. The ATD office also works with the Systems Engineer and other segments to ensure seamless transition of proven advanced technology products into the BMD System.

SUMMARY

The BMD System will counter the full spectrum of ballistic missile threats, capitalize on existing technologies and capabilities, and foster innovation. It will incrementally incorporate capabilities needed to detect, track, intercept, and destroy ballistic missiles in all phases of flight using kinetic and directed energy kill mechanisms and various deployment approaches. We have implemented a disciplined and flexible acquisition strategy to provide a timely, capable system. This approach protects against uncertainty by ensuring that the United States will have the ability to defend itself, its deployed forces, allies, and friends from a ballistic missile attack should the need arise.

I believe the approach I have outlined here toward developing and deploying missile defenses can meet the growing threat and provide for the earliest possible fielding of effective defensive capabilities.

Thank you, Mr. Chairman. I would be happy to answer any questions.

Senator REED. Thank you, General Kadish. Thank you, Secretary Aldridge. We will have 6-minute rounds of questions and if necessary conduct second and third rounds.

In your statement, General Kadish, you state that, instead of developing a system in response to a clearly defined threat from a known adversary, we are looking at missile capabilities that any

adversary could have in a given timeframe. Would that include the potential to defeat a missile with several warheads and with sophisticated countermeasures, such as the Russians might have?

General KADISH. The basic thrust of this development approach is not against those kinds of threats per se. It is against what we have been referring to as rogue states, or states of concern, but against the proliferation of missile attack, and the accidental launch issue of the Russian and Chinese arsenals is embedded in there, but the primary thrust is against the proliferating states.

Senator REED. I think this is stated rather broadly, any adversary could have any capability at any given timeframe, and we have at least the potential for much more sophisticated missiles that you are preparing our counterdefense for, is that correct?

General KADISH. That is correct.

Senator REED. There is some issue about this capability analysis in my mind. Basically, you define the threat, and you are trying to design a system against that threat, and it is not the comprehensive threat of any missile, it is the threat of rogue nations. Isn't that fair?

General KADISH. Well, Senator, it is hard to distinguish. At some point the basic missile technology is the same, and whether it is sophisticated, with integrated countermeasures and finely honed, machined warheads, or whether it is basically crude missile construction presents us all sorts of different problems, so eventually you have to assume that whoever the adversary might be, they are going to have sophisticated missiles.

Senator REED. So you are designing a system today that will counter the very sophisticated threats we know are possible to deploy?

General KADISH. We are designing a system that will be increasingly capable over time to handle threats that come up. That does not mean we have a grand design against all threats right out of the package, and that is the very essence of capability-based approaches, that we can build what we can against a reasonable threat projection and then build on it as rapidly as possible.

Senator REED. Let us turn now just to both you and Secretary Aldridge. In the general outline of the budget last year and the first year of the Bush administration, there was a 57 percent increase, almost $8 billion was provided, total, for missile defense. This is a significant increase, and it raises questions about how one can effectively spend that amount of money in a short period of time. Again, in this budget you are requesting about the same level of funding, and in following budgets it looks like the same level. This could be an odd funding profile for a major system that usually requires different levels of funding as the system matures, and the system tests out.

Secretary Aldridge, what can you accomplish at this level of funding for the next several years?

Secretary ALDRIDGE. First of all, this funding does not include any deployment. The decision is made that this is an R&D effort, that if the decision is made to deploy something, to begin the production of some piece of equipment that would be fielded, it would be moved to the appropriate Service who would have that responsibility, just as we have done for PAC–3, that is give it to the

Army. You see the funds transferred basically to the Army, even though General Kadish shows it as a line item, because it was transferred.

So a normal acquisition program that, as it phases through development and starts into production, you expect the budget to increase, but because this is basically an R&D effort which has been laid out for a variety of technologies for a variety of missile ranges, level funding is not unexpected in the first few years, as we put this program together, so it does not follow the same characteristics as you would see under a normal acquisition, where production is included in the cost estimates.

Senator REED. General Kadish, do you have a comment?

General KADISH. That is exactly right, and I would use an analogy to show how we would spend within that $8 billion allocation, and that would be, if you took an analogy of an airplane, you have hydraulics, you have the landing gear, you have avionics, wings, and the cost of those things varies over time based on the development and maturity of the parts, and that is how we are actually managing the program.

Senator REED. Secretary Aldridge, you anticipated my next question. There is no deployment money in this profile for the next several years, and General Kadish in his statement was talking about deploying a system over the next few years. Your prepared statement is optimistic about our ability to deliver effective missile defense capabilities over the next few years. That raises a question of whether or not, within the 5-year defense plan, you are considering whether you transfer to the Services the cost of a deployed system, how much it might cost, and where does the money come from?

Secretary ALDRIDGE. You are correct, there are no deployment dollars included in the Future Years Defense Program (FYDP). The reason is, we do not know what we are going to buy. We do not know where to put the money, and whether it is going to be an Army budget, an Air Force budget, or a Navy budget. When we get to the point of making a decision to deploy, which we will get into next week in looking at the management structure, there is a board of directors that oversees the activities of the Missile Defense Agency.

When a decision to deploy is made we will have to determine where the funds come from for that deployment based upon what it is we are going to deploy, but it really is impossible to provide you with a realistic estimate at this point as to what kind of money it would be, whether it is a ground-based, long-range interceptor, a national system, whether it is an Aegis sea-based, or whether we want to do more PAC–3s, or THAAD.

We have no estimate because we have not made that decision yet, so we cannot tell you what something will cost if it cannot be defined. When it is defined, we will have to come forth and tell you what the budget will be for that purpose.

Senator REED. My time has expired in this round.

Senator Allard.

Senator ALLARD. General Kadish, I thought your illustration on the video was pretty remarkable. It looks to me as though you have made some significant progress in this last year. Based on your as-

sessment of the BMD technology and your understanding of current intelligence, how confident are you that you can deliver a timely warfighting capability based upon what you think are the possible threats out there? I do not expect you to get into intelligence, but just based on what you know.

General KADISH. I think the first substantiation of that is our recommendation to procure the initial quantities of Patriot 3 that we started asking for last fiscal year and will continue to ask for. We have enough confidence right now that for deployed forces in whatever area, which we could actually protect with a PAC–3, that we will have an effective defense for theater ballistic missiles. That is the first step.

Then as we look at the various elements of the BMD System that we hope to test and have confidence in, we will be increasingly more capable over time against all ranges of threats. At this point in time we have a situation where the hit-to-kill technology I think is reaching the point where we can judge it reliable enough to be effective. We then have to judge the countermeasure systems that might be used against it and put in counter-countermeasures to handle that. As we then go over time I believe we can have an effective missile defense against ranges of threats that we are concerned about, but there are still many challenges ahead on that.

Senator ALLARD. Various critics, like the Union of Concerned Scientists, have maintained that relatively inexpensive countermeasures easily acquired or developed by rogue nations can defeat the BMD Systems you are trying to field. You refer to that in the latter part of your comments. Would you please describe the efforts you put into place to judge likely countermeasures, assess their effectiveness, and develop possible countermeasures against that, and who heads this effort?

General KADISH. We have spent a great deal of time talking internally about and deciding how to manage this countermeasure issue. I guess the best way to describe it is that we have a group of people that retired Gen. Larry Welch is heading up for us whom we call the red, white, and blue team, for lack of a better term, where the red team conjures up countermeasures, the blue team responds with the potential counter-countermeasures, and the white team referees any testing that we do along those lines.

Now, we have not fully implemented all the different facets of that approach, but we are well on our way. In fact, we have some money in the budget allocated for that effort this year, so given the threat documents that we have, the intelligence that we have, and the effort by this group and internal to the agency itself with our contractors, I believe we will have a very good handle on the countermeasures problem, but again, you are never certain about something like that. This is a game that is played in every military system, but I believe that we will not be in a situation, especially with layered defenses, where we will be easily defeated by simple countermeasures.

Senator ALLARD. Secretary Aldridge, I have no doubt some missile defense technology efforts will run into unexpected challenges on occasion, and it seems apparent to me that you intend to exercise close scrutiny over the MDA program elements and technology development. You have been a stern judge of some of these efforts

already, including the Navy Area defense and SBIRS-Low. Yet some of our colleagues express a continuing concern that the various offices of acquisitions, technology, and logistics will be cut out of MDA program oversight, and I have a couple of questions in that regard. Can you assure us that the MDA efforts will get sufficient independent review from your offices?

Secretary ALDRIDGE. Absolutely. As we will discuss in great detail next week, we have a process in place to continue to provide that oversight responsibility both to the Office of Secretary of Defense, through the Senior Executive Council, which will be the board of directors, as well as independent advice to General Kadish that will provide him the viewpoints of the various offices within OSD.

You can be assured that I have a personal stake in this matter. General Kadish can attest to the fact that I get heavily involved in two major programs, both Navy Area and SBIRS-Low, which you have mentioned. I do not think there is any doubt in their mind that OSD has sufficient oversight of those programs.

Senator ALLARD. What formal mechanisms do you have in place to find out about program problems after a decision has been made to move a project to a Service for procurement?

Secretary ALDRIDGE. When it goes into the normal procurement process, it will go into our normal defense acquisition system. There will be a Defense Acquisition Board (DAB). Once a decision is passed for deployment, which we would call milestone C, the normal process will occur, just like it does in any other weapons system. When it transitions from R&D, which General Kadish will perform in his Missile Defense Agency, if the decision is made to deploy, we will select the Service.

There will be a transition period in which the Service will become involved, but then it will be in the normal process.

Senator ALLARD. Mr. Chairman, I see my time has expired.

Senator REED. Thank you, Senator Allard. Senator Byrd.

Senator BYRD. Thank you, Mr. Chairman.

General Kadish and Secretary Aldridge, on February 16, 2002, *The Washington Post* carried an article titled: "Rumsfeld Pares Oversight of Mission Defense Agency." Are you familiar with that article, Mr. Secretary?

[The information referred to follows:]

The Washington Post
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February 16, 2002, Saturday, Final Edition

SECTION: A SECTION; Pg. A02

LENGTH: 1101 words

HEADLINE: Rumsfeld Pares Oversight of **Missile Defense** Agency

BYLINE: Bradley Graham, Washington Post Staff Writer

BODY:

Defense Secretary Donald H. Rumsfeld has granted the agency that is overseeing development of a national **missile defense** system extraordinary freedom from normal Pentagon procedures for controlling and monitoring new weapons programs.

Under the special authority, the agency will be exempt from regulations that compel military commanders to specify requirements for new weapons. The agency also will not be subject to traditional reporting about program timelines and costs. And many of its testing efforts will be free from oversight by the Pentagon's test evaluation office. The unusual exemptions, outlined in a memo from Rumsfeld released with little fanfare last month, illustrate how the Bush administration is proceeding apace with plans to accelerate development of a national **missile defense** system -- its chief defense policy objective before last September's attacks -- even as it wages global war on terrorism.

But the wide latitude the administration has given **missile defense** planners to skirt traditional Pentagon accountability and oversight rules also has drawn warnings from watchdog groups and some members of Congress concerned that the Pentagon is handing **missile defense** officials what amounts to a blank check.

The Bush administration is spending $ 7.8 billion on **missile defense** research and development in the current fiscal year, up $ 2.5 billion from a year ago, and has asked Congress for an additional $ 7.8 billion for the fiscal year that begins Oct. 1.

E.C. "Pete" Aldridge, the Pentagon's undersecretary for acquisition, said the moves were intended to streamline oversight activities that too often have imposed intrusive paperwork, overlapping requests for information and other unnecessary and time-consuming demands on **missile defense** authorities.

"We needed to give them a process by which they could put all these things together without all the encumbrances of having so much oversight and so many briefings that have to be done at multiple

levels," he said in an interview.

Some in Congress, however, are already expressing doubts about the wisdom of the Pentagon's rationale and say the measures may require additional legislation.

"It raises a whole set of questions," said a senior Democratic staff member in the Senate. "They're getting out of many of the checks and balances that usually apply in major weapons development."

Aldridge said he could think of no other Pentagon program that has such exemptions. He drew an analogy with establishment of the National Reconnaissance Office, which was set up in great secrecy in the 1960s to develop and operate spy satellites.

"While we can't do exactly the same thing with **missile defense,** the concept is still similar," he said. "So we need to make sure that they have all the mechanisms they have to make decisions quickly, appropriately and in a way that they can solve this very difficult problem."

Further underscoring the high priority the administration is placing on the **missile defense** program, Rumsfeld's memo elevated the Pentagon group responsible to full agency rank and changed its name -- from Ballistic **Missile Defense** Organization to **Missile Defense** Agency. The memo directed that the agency be staffed at 100 percent of authorized levels, a significant move in a department where many branches make do with personnel slots unfilled.

"The special nature of **missile defense** development, operations and support calls for nonstandard approaches to both acquisition and requirements generation," the memo said.

Asked why the **missile defense** effort should receive such exceptional treatment, Aldridge replied, "National priority." A second reason for assigning special status to the initiative, he said, is the particularly complex nature of its mission to invent not just a single anti-missile weapon but "a system of systems" for defending the United States against attack.

The administration intends to pursue a host of possible weapons -- land- and sea-based interceptors, airborne lasers and space-based devices -- aimed at knocking down enemy warheads in various stages of flight.

Rumsfeld's memo made clear that the **Missile Defense** Agency director -- a three-star position currently filled by Air Force Lt. Gen. Ronald Kadish -- will be in charge of shepherding the programs through their experimental phases. Once deemed ready for procurement, the plan is to turn control of the weapons over to the Army, Navy or Air Force. At this point, they would be subject to normal oversight procedures.

Rumsfeld also reserved the right of the secretary of defense to approve use of any of the experimental test assets for "contingency or emergency deployment." Administration officials have made no secret of their desire to have in place as early as 2004 a new testing facility in Alaska that could also constitute a rudimentary defense against North Korean missiles.

Normally, work on a new weapon system is guided by detailed operational requirements that, in turn, are based on specific projected threats. Instead, the Bush administration intends to define a more general set of capabilities and attempt to reach them in phases or developmental "blocks" spaced in two-year intervals.

The decision to dispense with normal Pentagon performance requirements, critics say, is like putting the

cart before the horse. "Rather than first spell out what's needed, it sounds like they're just going to create something and then say this is something we need," said Lisbeth Gronlund, a **missile defense** specialist with the Union of Concerned Scientists. "In effect, they're saying: 'Whatever you've got, we'll take.' "

Several members of the Joint Chiefs also expressed reservations last year when first briefed by Rumsfeld and Kadish on the new approach, according to participants. They worried that the **missile defense** organization might stop short of developing an optimal system and settle for something insufficient. They also were wary of handing the agency billions of additional dollars without some way of controlling how the money would be spent.

To protect the services' interests in the **Missile Defense** Agency's programs, Rumsfeld has established a high-level oversight group called the Senior Executive Council, consisting of the service secretaries as well as the deputy secretary of defense and the undersecretary for acquisition. He also has set up an advisory team -- the **Missile Defense** Support Group, which includes senior representatives from such Pentagon offices as finance, policy, personnel and acquisition.

Secretary ALDRIDGE. Yes, sir. I have heard about it.

Senator BYRD. The gist of the article was that the Pentagon will not hold national missile defense programs to the same reporting and oversight standards as other major weapons systems. Secretary Aldridge, what is so important about national missile defense technology that exempts it from the same kind of rigorous review that is expected of other weapons systems?

Secretary ALDRIDGE. Yes, sir, Senator Byrd. That article is wrong. We have a process in place through which the OSD will provide oversight. Again, we are getting into next week's issues, but let me go ahead. There is a Senior Executive Council that is chaired by the Secretary of Defense, the Deputy Secretary of Defense, the three Service Secretaries, and myself. They will act as a board of directors for any decision that is made regarding deployment and the stopping or starting of any program within missile defense.

In addition to that, we created a Missile Defense Support Group (MDSG), which consists of all the OSD offices that have any degree of oversight over the Missile Defense Agency or its budget. It is also supported by a Missile Defense Working Group, which has the key technical analysis of all the organizations, including the Services, out of which the MDSG reports directly to me. It has a function to supply input into the Missile Defense Agency to General Kadish. It is also the body which will provide input to the Senior Executive Council when they make decisions regarding the deployment of missile defense.

Once the R&D program is over, any program in missile defense that goes to a Service will go into the normal acquisition system, as any other weapons system in the Department of Defense. It will act the same way, so there is no credibility to the article that we are losing oversight to the Missile Defense Agency.

Senator BYRD. Will Congress continue to receive cost estimates, testing goals, and other important information about missile defense programs with respect to national missile defense technology?

Secretary ALDRIDGE. Yes, sir.

Senator BYRD. Last year, the Defense Authorization Act included a provision that requires the Department of Defense to report to Congress on annual program goals for national missile defense research. It may be that this information is buried in the thousands

of pages in budget documentation that the Pentagon has given to Congress, but I do not know of any clear, concise report of that information.

Mr. Secretary, has the Department complied with the provisions of law that require the Department to give this information to Congress?

Secretary ALDRIDGE. Yes, sir. I will let General Kadish answer that question.

General KADISH. Senator Byrd, we believe we have and will continue to. We have submitted many hundreds and thousands of pages of support documentation, and I have gone through, I think, 25 or more hours of briefings of the personal and professional staff members, and I am hoping through that process we have answered not only the intent but the letter of the request of Congress last year. If that is not the case, then we need to go back and make sure that we do.

Senator BYRD. Do you plan to give Congress briefings or supply a clear report of the annual program goals for missile defense programs?

Secretary ALDRIDGE. Yes, sir.

Senator BYRD. Secretary Aldridge, you just said that missile defense programs will receive rigorous independent review. My concern is that Congress has access to this critical information in a timely manner. Can this information be supplied, and will it be supplied, to Congress so that it can act in a timely manner?

Secretary ALDRIDGE. Yes, sir.

Senator BYRD. Last year, you canceled the Navy Area program, but for months the Pentagon claimed that this program was a success. Why did it take so long to tell Congress that you were wrong, and that the program was a failure? Is this the sort of independent review we can expect?

Secretary ALDRIDGE. No, sir. We did notify Congress—the Nunn-McCurdy Act has a requirement that we live by. We did notify Congress of a cost breach of over 25 percent. I think it was at the normal time when we have to notify Congress.

There is a period of time which elapses for us to have to recertify the continuation of that program. In the process of working through to get the details of the recertification process, we found that the costs were increasing beyond the 25 percent threshold that we were required to notify Congress of ahead of time. That deadline for certification ran out on December 13, 2001.

The Secretary of Defense has delegated to me the authorization to recertify if we believe the program should continue. At that point I have to make certification on four criteria. First, is this program in the Nation's interest. Second, there is no other alternative to the program. Third, that the costs are under control. Fourth, the management system is in place to keep the costs under control.

From the time we notified Congress of the time when I had to make the certification, the cost estimates had grown from roughly 25 percent to over 70 percent. I could not sign a letter that said I believe these costs were under control, and by law the funding must terminate. That is an indication of the kind of oversight we will continue to have for missile defense, but it was clear that we

could not continue the program under the conditions that the law has dictated to us.

Senator BYRD. So Congress is and will be apprised of the results as stage to stage is reached, and the final result, what the money is for.

Secretary ALDRIDGE. Yes, sir. The process we have in place will clearly provide Congress with the information they need to carry out your duties.

Senator BYRD. Mr. Chairman, I think my time has expired. May I ask another question?

Senator REED. Yes, Senator, please.

Senator BYRD. Thank you, Mr. Chairman. Thank you, Mr. Allard.

Mr. Secretary, do you believe that providing this information to Congress constitutes an incumbrance, or constitutes an excessive burden on the Missile Defense Agency?

Secretary ALDRIDGE. No, sir.

Senator BYRD. Categorically, are you saying no?

Secretary ALDRIDGE. No, sir.

Senator BYRD. Thank you, Mr. Chairman.

Senator REED. Senator Nelson.

Senator BILL NELSON. Senator Byrd, would you like my time? I would yield to Senator Byrd.

Senator BYRD. I thank the Senator. That is very kind of you. I am quite willing to stay and take my turn again.

Senator BILL NELSON. Go ahead.

Senator BYRD. In the past, the GAO has had trouble getting documents about missile defense programs in a timely manner—and excuse my voice. I do not have the voice I had when I was 21.

Senator BILL NELSON. But you have a lot more power than when you were 21. [Laughter.]

Senator BYRD. Which was a long time ago.

The GAO has reported that it took as long as 4 months for the Department of Defense to fulfill some of the document requests. These delays hinder efforts to expose the inner workings of the Pentagon to even a small bit of daylight. General Kadish, what measures have been taken to make sure that the General Accounting Office has access to the information it needs to complete its reports?

General KADISH. Senator, we have a process that we use for all kinds of information exchange, either with the GAO or any agency, and we try to do it as expeditiously as possible. That process is a continuing effort, and we make, in my view, a good faith effort to get those documents out.

The bureaucracy, however, does turn at its own rate, and we try to expedite it as much as possible. There are many people who get involved in that type of delivery mechanism throughout the Department of Defense.

Senator BYRD. The General Accounting Office is an arm of Congress. You recognize that?

General KADISH. Yes, Senator.

Senator BYRD. So when the GAO requests information, it is Congress that is requesting the information. That is understood, is it not?

General KADISH. Yes, sir, and we have long-established procedures for dealing with that, and we follow them as religiously as possible.

Senator BYRD. But my question is, does the Department recognize that the General Accounting Office is an arm of Congress, and when the Comptroller General asks for information that is helpful to Congress in its conduct of the oversight of these programs and the appropriations therefore, is it not recognized that this request from GAO is in essence a request from Congress?

Secretary ALDRIDGE. Senator, let me answer that for the Department of Defense. The answer is, absolutely. We have a very good relationship with David Walker and GAO. I was with him all morning on a panel that we both sit on, and it is clear that the GAO is an arm of Congress and provides information to you just like any other agency would.

Senator BYRD. Very well. I have one more question.

General Kadish and Mr. Secretary, would you provide the GAO with the information it needs in a timely and complete manner?

Secretary ALDRIDGE. Yes, sir.

General KADISH. Yes, sir.

Senator BYRD. Thank you, Mr. Secretary. Thank you, General. Thank you, Mr. Chairman.

Senator BILL NELSON. Mr. Chairman, do I have any of my 6 minutes left?

Senator REED. You have 1 minute.

Senator BILL NELSON. In that 1 minute, could you explain to us what happened to the old space-based system? Mr. Secretary, we were going to develop a space-based missile defense system. Whatever happened to that, and how does that compare with this?

Secretary ALDRIDGE. The program that General Kadish has outlined has a part of it called the boost-phase intercept, and parts of the technology he is looking at are space-based elements either kinetic kill vehicles or Space-Based Lasers and things of that nature. That is a little further out in time, but it is an element of his program.

Senator BILL NELSON. But that was not what you were testing here?

General KADISH. That is correct. The tests that I showed you here were ground-based and sea-based intercept attempts. As we get further down in our program execution, starting basically in 2003 and out, we will be doing increasingly more experiments in the space arena.

Secretary ALDRIDGE. But the hit-to-kill technology, even though it is on an interceptor going up, is not very much different than an interceptor coming down. It is the same technology, and the progress that is being made in hit-to-kill technology has a wide application across boost, midcourse, and terminal phases.

Senator REED. Senator Allard.

Senator ALLARD. Thank you, Mr. Chairman. Senator Byrd had expressed his interest in the Navy Area defense, and I want to express my interest in SBIRS-Low, both of which I mentioned earlier. I want to pose this question to both General Kadish and Secretary Aldridge.

SBIRS-Low ran into some heavy political opposition in Congress last year, and some opponents questioned both the technology and the requirements of the program.

First of all, I would like to know whether you are both supporting SBIRS-Low or not, and what are the continuing needs for the capability that would be provided by SBIRS-Low?

Secretary ALDRIDGE. First, Senator, I clearly support SBIRS-Low. It is quite disappointing that we had to take the action that we did take on the program. It is going to be an essential part of the future missile defense capability, and unfortunately it ran into some problems such that I could not come forth and tell you honestly that we could deliver the weapon or the spacecraft on the schedule that was provided at the cost that we were given.

Again, that is what I am paid the big bucks for, to make a decision on these kinds of programs. It was clear that program was unexecutable with the cost and schedule that was being developed, and therefore I had to make a decision that we were going to restructure the program so that when we do come back to Congress with a program for SBIRS-Low, it is one that I can tell you honestly we can deliver on schedule, with the performance, on the cost that we tell you it is. I could not do that with the SBIRS-Low program that was being developed.

The money that was provided for in fiscal year 2002 was reduced in conference, and we are using those dollars to restructure the program. General Kadish has been requested to come back to me with a restructured program, I think in a month or so, so that we can determine where we go at this point in time and what kind of program is going to be viable, but we have to have something like this program to make our missile defense program viable.

Senator ALLARD. General Kadish?

General KADISH. I would endorse exactly what Secretary Aldridge said in terms of the support of SBIRS-Low. I think we need a space sensor in order to bring along the effectiveness of all the missile defense elements, and we are attempting now to restructure the SBIRS-Low program to meet those requirements as best we know how and to orient it to a capabilities-based approach.

One major debate that will go on, I think, for some time is whether we need a space-based sensor, or can we do it with radars alone on the ground or at sea. I think at this point the evidence and the studies that I have seen are not compelling enough to make such a stark choice, certainly at this time, and the belief I have currently is that we are going to need to have both radar and space-based sensors to do this job effectively, we still have a lot of work to do, but in the meantime, SBIRS-Low is a critical space-based element of our sensor suite.

Senator ALLARD. General Kadish, you mentioned other systems that may provide some of the capability we have in SBIRS-Low, but are we moving ahead with those systems, or are we pretty much focusing on SBIRS-Low?

General KADISH. We are moving ahead with both. The problem we have with terrestrial-based sensors is geography. They have to be in the right spot. The advantage of space is that we have the ability to have a wide-ranging view of our threats base.

Senator ALLARD. The thought is that it is probably not to our advantage to have those kinds of facilities where you would have to ask permission in other foreign countries for those facilities.

General KADISH. The unfortunate part of ground-based systems is you cannot base them on U.S. territory and be totally effective in missile defense.

Senator ALLARD. So you have a problem there, using it on foreign soil?

General KADISH. Correct.

Senator ALLARD. Secretary Aldridge and General Kadish, you are both probably aware that the Congressional Budget Office (CBO) was recently asked by Senators Levin, Conrad, and Daschle to estimate the cost of several of the BMD Systems that could protect the U.S. homeland from long-range ballistic missiles. The Senators who requested this study estimated the cost of a modest defense to our homeland at $150 billion. Can you comment on the relevance of the CBO study and the specific systems it analyzed?

General KADISH. Sir, if I might take that question, the CBO study was well done for the assumptions that it made. The problem is, the assumptions on which it was based could potentially give an inaccurate picture of what any of these systems might cost. The definition of life cycle, the definition of the systems that were actually in that report at this point in time, do not bear a resemblance to anything we are working on in detail, so the art of cost estimating could get a little bit out of whack from that standpoint.

It is useful information for illustrative purposes, but we do not have a force structure defined well enough to tell you, as Secretary Aldridge pointed out earlier, exactly what these things are going to cost at this point in time. As we define our production and deployment efforts, we will have those cost estimates, and at that time I think we should have that debate.

Senator ALLARD. So valid assumptions are important and, based upon that, you do not believe the $150 billion estimate is valid?

General KADISH. There are a lot of problems with that estimate, and we are not building those configurations, so I do not think it is valid.

Senator ALLARD. Thank you.

Senator REED. Thank you, Senator Allard. Senator Nelson.

Senator BILL NELSON. As I understand both of you, you subscribe to the doctrine that you cannot deploy something that has not been developed, and as I understand both of you, you are saying that the matter of deployment is something that you will come to Congress to get the appropriations for?

Secretary ALDRIDGE. Yes, sir, that is correct.

Senator BILL NELSON. What is it, then, about the R&D program that in your mind caused a violation of the ABM Treaty that thus required a withdrawal from the treaty?

Secretary ALDRIDGE. Let me start, and General Kadish can maybe come in on this.

When the President asked us, General Kadish and the Department, to develop a missile defense program, it was under the assumption that program would proceed without the constraint of an ABM Treaty. We were heading toward developing the most effec-

tive missile defense system we could build with the resources made available to us.

As that program was proceeding, we were running into constraints of the treaty that were prohibiting us from making progress in the R&D phase, such as, we were trying to use the Aegis radar to track some targets and some interceptors, which was clearly a violation of the ABM Treaty. We were trying to get data, data that would help us in looking for midcourse capabilities, for radar technology that would help us in the future. In fact, we did, we eliminated certain aspects of those tests because we were living under the ABM Treaty, and the decision was made to do so, but as you continue to proceed developing a wider range of testing, more capability, it was clear we were losing ground relative to getting more and more data that would give us the confidence to proceed because of the ABM Treaty.

In addition to that, if there was a need to deploy for some emergency reasons, which we are looking for, like the 2004 timeframe, it was relatively clear that if we started to deploy a national system there would be arguments that that was a violation of the ABM Treaty, so we were restricting the President's options. I think the combination of restricting his options and prohibiting us to do a thorough testing program, a judgment call was made that the strategic situation has changed sufficiently that missile defense is the right way to go, given the other strategic conditions, such as nuclear warheads and so forth, that the President made the decision to withdraw from the treaty. We are still living by the treaty up until June 13, and we are still having to restrict the number of tests.

Senator BILL NELSON. So there is not a part of your testing right now that you consider a violation of the treaty?

Secretary ALDRIDGE. No, sir, we are not violating the treaty.

Senator BILL NELSON. You mentioned the Aegis system. Is testing on that in the future going to violate the treaty?

Secretary ALDRIDGE. If you use the Aegis radar as a ship-based missile defense system for national purposes, that was a violation of the ABM Treaty, and I do not remember the article. I think it is Article VII which says you cannot test mobile ABM systems.

Senator BILL NELSON. Now, given the delicacy of the situation with the Russians, there is a joint program that you requested money for, RAMOS. Have the Russians given any indication that they intend to continue the program since your announcement to withdraw from the ABM Treaty?

Secretary ALDRIDGE. I have not talked with them. Maybe General Kadish can answer that.

General KADISH. We have been in discussions with the Russians over the RAMOS program activity, as well as other cooperative efforts, to some degree, and at this point in time I cannot tell you what their final decision is going to be in terms of participating. We have been at this I think almost 7 years, trying to get this particular effort off the ground with the Russians. At some point here in the next 6 to 8 months, I would expect we are going to have to make some major decisions on that program, but right now we are still in discussions, and things are proceeding and we are waiting for a final go-ahead from the Russian Government.

Senator BILL NELSON. That is a program of small satellites, so that you have a canopy up there that would detect through infrared any kind of missile launches?

General KADISH. It is an experimental set of satellites to do what you describe, so it is not a constellation. It is two satellites to experiment in technically interesting wavelengths.

Senator BILL NELSON. Would we go it alone, without the Russians, if they pull out?

General KADISH. My recommendation to the Secretary would be no.

Senator BILL NELSON. Why is that?

General KADISH. We have some mutual benefit out of the program, but when I look at the scheme of things there are other ways we could accomplish that if we had a unilateral approach.

Senator BILL NELSON. As I understand it you are going to have a hearing on this next week.

Senator REED. I am, Senator.

Senator BILL NELSON. A continuation of this?

Senator REED. A continuation, but more a focus on program management.

Senator BILL NELSON. I have to run to a meeting with Senator Graham right now, and I will save questions for next week. I would like to get into it. I happen to think Secretary Aldridge is about one of the best appointments in this administration, and I think that he has a great deal of wisdom and experience, and I want to poke and probe it a little further.

Secretary ALDRIDGE. As you have done many times before.

Senator REED. Thank you, Senator Nelson. Also, thank you for your graciousness in yielding to Senator Byrd.

Secretary Aldridge, just for the sake of clarification, I know we are going to get into program management in the next hearing, but in a dialogue between Senator Byrd and yourself, you pointed out that Navy Area was canceled as a result of Nunn-McCurdy. Would Nunn-McCurdy apply to this new review by the Senior Executive Council? Would you feel compelled to apply that there?

Secretary ALDRIDGE. The Nunn-McCurdy applies to programs, and we would like, if we got into SBIRS-Low, for example, as part of the missile defense program, Nunn-McCurdy would apply to that. If it is just an R&D program without development, or deployment, I think it would not apply. I would have to go back and look at the language, but I think it only gets into programs when we have procurement.

Senator REED. As you stated today, everything you proposed in this $8 billion budget is RDT&E, it is not deployment, so effectively with regard to Nunn-McCurdy, which has proven useful at least in one circumstance, if not several, you are not only forcing a decision but also making a tough decision about a program that would no longer be operative.

Secretary ALDRIDGE. I think that is true, but again, I do not know. I cannot recall the details of Nunn-McCurdy in this particular instance with the Navy Area, which we had, in fact, started into a deployment mode. It did apply, but I do not know exactly what the degree of threshold would be for R&D.

Senator REED. We will give you an opportunity in the next hearing.

Secretary ALDRIDGE. I will check into that beforehand.

Senator REED. Let me raise another question along the lines of deployment and RDT&E. General Kadish, you have spoken a number of times about a possible contingency deployment at Fort Greeley, Alaska, of five prototype test missiles in conjunction with the Cobra-Dane intelligence radar. In your view, is that an RDT&E which you could do now if sufficient resources were appropriated this year?

General KADISH. That is a part of the test bed that we talked about during last year's hearings and discussions as well as this year. The primary use of those assets would be a part of this test bed, which would be both ground-based test activity and used in flight tests, depending on how we actually do it. The contingency capability that I have talked about is a decision yet to be made, whether or not we would activate that capability.

Senator REED. But you would put in place five missiles at Fort Greeley?

General KADISH. That is correct.

Senator REED. Is the Cobra-Dane radar a pilot test bed?

General KADISH. Plus many other things.

Senator REED. Is it a part of research and development? Would you at some point say, is it now contingently operational?

General KADISH. If it is judged effective enough for what we think it could be used for, and the Secretary judges it to be so.

Senator REED. I understand that, and please correct me if I am wrong, you cannot actually launch the missiles from Fort Greely, since the debris from the missiles could fall on populated areas.

General KADISH. Initially, we have not specified that we would launch from Fort Greely. We have environmental regulations and rules that we have to evaluate before we would make such a decision. I would not, however, rule out that capability. In fact, it would be very desirable we do that type of thing now, even in the continental United States, at the White Sands Missile Range, where we could actually move people off of the endangered area of the range to do the missile test. We have some environmental restrictions, and we will go through those in a very disciplined way to make those types of decisions should we decide it is in our best interest to do that.

Senator REED. But you have already decided, I presume, to put the Test Bed up at Fort Greely, even though there is a question whether or not the missiles can be fired?

General KADISH. That is correct, because the value of the Test Bed should not be underestimated from the physical location of those assets where we might be using them in an operational mode. We have taken some heavy criticism about not being operationally representative in the phasing of our testing, not just flight testing, i.e., having the actual infrastructure hooked up with the communications links, the computer systems, and those types of things. Just as we build prototype F–15s and ships and tanks, we want to do the same for missile defense.

Senator REED. One other question with respect to Fort Greely. I also understand that because of geometric considerations you will

not have an ICBM-class target with which to test the Fort Greely missiles and Cobra-Dane radar, even if you could launch from Fort Greely.

General KADISH. We are still looking at the target situation. We have a long-range, air-launched target under development. We have not fully defined what that requirement is going to be. It would certainly not be in place for the 2004 timeframe, but we have some decisions to make for the outyears as we go into further testing.

Senator REED. But just to conclude, there is a possibility that you could declare a contingent deployment by 2004, even though there is a question whether the missiles can actually be fired from that location, and you have not yet defined a target missile to test against and are unlikely to do so before 2004.

General KADISH. I think embedded in that statement are a number of incorrect assumptions. First of all, we will continue our testing out of Kwajalein and Vandenberg and other areas aggressively over the next few years. That gives us confidence that no matter where we launch the interceptor from, it will be effective against the target that we are aiming at, and therefore, having the missiles in the Test Bed, should we judge them effective enough through that other testing, it does not matter whether we have fired them out of that location, although we would like to.

I will point out that our strategic missile offensive force has not, to the best of my knowledge, been fired out of the locations they have been deployed at in the United States. It is the same issue.

Senator REED. Let me reserve some additional questions for a third round. I recognize Senator Inhofe.

Senator INHOFE. Thank you, Mr. Chairman. First of all, I apologize, Mr. Chairman, for not being here for the entire hearing. We had two amendments on the floor that we were busy with.

I do not know what has been asked, but I have worked with both of you before and, quite frankly, it is a relief that we are where we are today, and where I think we should have been several years ago. I am sure you have discussed the options of sea-based and land-based missile defense.

Most of us who have been pushing for this for a long time have come to the conclusion that we need to do something with the Aegis investment we have right now, given the high tier capability, in terms of the flexibility, and also capitalizing on an investment that has already been made with the Aegis system.

Where are you on that particular system right now? What are your thoughts for the future?

General KADISH. Senator Inhofe, I was very pleased to have in my opening statement a video showing our first intercept of the Aegis Leap Intercept (ALI) program, and that was a very exciting event for a lot of us who have been laboring in this program for sometime. I expect that we will have our challenges technically with that, but it is a key part of our program because of the mobility that Aegis provides, as well as the capability.

Senator INHOFE. About how many ships would you be wanting to get to become capable with this?

General KADISH. Senator, I am unable to answer that question now because we will have to make some judgments when the test-

ing gets a little further along and how effective is it versus the threats we are going after, and then provide recommendations to the Secretary as to the force structure.

Senator INHOFE. When you think about the changing threat that is out there, last time we had a meeting like this we would never have thought that we would be in Afghanistan today, and when you think about the flexibility and the places that it can be put, that is something that I think is the most flexible for these threats that we cannot anticipate.

Now, it is my understanding that in terms of the ABM Treaty we are going to be able to go ahead and not worry about that after about July or August. What is the timeframe?

Secretary ALDRIDGE. I believe it is June 13.

Senator INHOFE. There are several of us who have felt for quite a number of years that this is something, a step that should have been taken a long time ago, and it is interesting because even the architect of the ABM Treaty of 1972, Henry Kissinger, has said that it is insane to make a virtue out of your vulnerability, which is exactly what we have done.

Secretary ALDRIDGE. Senator, I was part of the negotiating team 32 years ago.

Senator INHOFE. I knew that you were. Let me ask you this, then. Do you agree?

Secretary ALDRIDGE. It sounded like a good idea at the time. [Laughter.]

Senator INHOFE. I hate to tell you this, Mr. Secretary, I did not think it was a good idea at the time, but certainly with two superpowers, and with the environment we were in there, it was certainly a good argument. Are you pretty much in agreement now with Henry Kissinger and his new view?

Secretary ALDRIDGE. Sir, I support the President very strongly on this one.

Senator INHOFE. There are a lot of others that came forth, Condoleezza Rice and others, who were very forceful in thinking sooner or later we are going to have to put that relic to bed and start defending America.

One of the problems I have had over the last few years is how bad our intelligence has been in determining when countries are going to have this capability. I remember the August 1998 inquiry we made. We asked General Shelton, Chairman of the Joint Chiefs of Staff, how long it would be until North Korea would be able to accomplish a multiple-stage rocket, and the response we received was, it is going to be somewhere between 5 and 10 years, and then 7 days later, one was fired from North Korea.

Then I recall the NIE of 1995, when they said how many years it was going to be, but then they put the word indigenous in, and I always felt that does not make any difference. If Iraq has the capability of a missile that will reach the United States of America, whether it is indigenous or not does not make any difference to me. It still does the same damage. Are you satisfied that since we have progressed to the point where we are now, that you are going to be able to move forward, and that there are not any other obstacles, major obstacles in the way, as the ABM Treaty was, for quite a while?

Secretary ALDRIDGE. Yes, sir. Well, obviously we still have to live with the treaty through June 13. There are certain things we cannot do during the testing process, but at that point in time I do not anticipate we will have any difficulty doing the tests we need to do to prove the system.

Senator INHOFE. I am very proud of all of you who had the fortitude to stay with it. I am satisfied with where we are today. Thank you very much.

One other question on the budget, and I think that is what we should be talking about today. Are you having serious problems in getting the budget that is necessary to reach our deployment when we want to?

Secretary ALDRIDGE. So far we have not heard of any major cuts in the request that the President has made. That does not preclude that happening as we go down through these hearings, but so far I guess I have not heard of anything at this point.

Senator INHOFE. Thank you very much, Mr. Chairman.

Senator REED. Thank you, Senator Inhofe.

General Kadish and Secretary Aldridge, Senator Byrd raised questions of compliance with informational requirements to Congress, and in the Defense Authorization Act for Fiscal Year 2002, one of the important requirements was the one to include total life cycle cost for each missile defense program that enters the engineering and manufacturing development (EMD) phase. This is section 232 of the act.

I understand the THAAD missile defense program is in the EMD phase, yet its life cycle cost estimate was not provided to Congress. Can you explain why those costs were not given to us?

General KADISH. Senator, I would like to take that for the record.

[The information referred to follows:]

The life cycle reporting requirement of Sec. 232(d)(2)(A) calls for life-cost information on Missile Defense programs that enter EMD or the equivalent phase. Under the new acquisition management strategy for Ballistic Missile Defense System elements, life cycle costs will be developed to support the decision process to move a block configuration of an element into production and operations. The old EMD phase for THAAD was cancelled. Life cycle costs for a block configuration of THAAD will be developed at the appropriate time as part of the decision to procure a quantity of that configuration and these costs wil be provided to Congress accordingly.

General KADISH. There are some technicalities here. We certainly want to follow the letter as well as the spirit of the law, but right now the way the program is constructed we have nothing technically in engineering and manufacturing development. It is all in R&D, so THAAD is no different in technical terms from SBIRS-Low or Aegis Leap Intercept. However, that may be a distinction without a difference for the intent of the question, so I would like to make sure we go back and answer what we really can do along those lines.

However, I will say this. No matter what answer we give you from an overall perspective, the force structure that we will buy as a basis for that life cycle cost estimate is not settled. We originally had an inventory objective of 1,200 missiles. As Secretary Aldridge pointed out, that may or may not be the right quantity based upon where we think we are going to go with that particular element of the program, so since life cycle costs are inherently based on things like the quantities you are going to buy, how many of them, where

you are going to put them and so forth, we may have a situation where we cannot accurately give you those costs at this point in time.

Senator REED. Is it your contention that THAAD is not in any part in the EMD phase?

General KADISH. Again, that may be a distinction without a difference. It is certainly in the development phase, and what we would like to do is supply you the cost numbers that will get at the spirit as well as the intent of the question, but we have severe limitations in telling you what the life cycle cost is over 20 years, when we do not have a basically agreed-to force structure like how many missiles we are going to buy, and so that is going to be a problem. We could probably tell you what the first missile is going to cost.

Senator REED. Secretary Aldridge, you have done a lot of research and development and bringing products to the field. Is it difficult to calculate life cycle costs for a system, even though you might not know how many F–22s you are going to buy, or how many of anything you are going to buy?

Secretary ALDRIDGE. Normally when we enter what used to be called EMD, which is now called system development and demonstration (SDD), we have a program that is usually laid out, as we have for Joint Strike Fighters. When we entered the SDD just last October, we have an inventory objective set up and we can tell you, we have a schedule, we have a production schedule, we know how many we are going to build, and we can tell you what the life cycle cost is going to be.

There has been no decision, a Milestone B Decision, to enter SDD for THAAD. We have not made a decision on that. We have not made an inventory, so I cannot tell you what the life cycle cost is going to be without an inventory objective. As soon as we get there, we will. There is no attempt to try to not comply with Congress on this, but we have no objective in mind.

We do have an inventory objective for PAC–3. We have an inventory objective of 2,200 missiles. We can lay out a life cycle cost for that, but I think THAAD is in this gray area and we have not made a decision on how many we are going to build, when we are going to build it and so forth, so it is hard to do that. But when we do, when we get to that point, there is no doubt that we can give you a life cycle cost.

Senator REED. Let me raise another question about the overall budget, and that is, you have proposed to fund the BMD System element at over $1 billion for this year, fiscal year 2003, and this element provides integration of the individual ballistic missile defense elements, but the design and architecture of these individual ballistic missile defense elements is not yet known. I think the testimony this afternoon reflects that. In response to practically every question we have raised you said we just do not know yet, we do not know what it is going to look like, and yet you are asking for $1 billion to integrate elements which you have not committed to do yet, roughly one-seventh of the total request. What is your rationale?

General KADISH. The rationale is quite simple. We have to fund the infrastructure to do that thinking and development effort to give ourselves those answers, so those particular funds buy an

awful lot of the infrastructure that underlies our elements, including the integration engineering that answers the very questions you are posing.

Senator REED. But $1 billion? We are not talking about infrastructure in terms of the hardware, the missiles necessarily.

General KADISH. No, but we are talking about test infrastructure that is common for a lot of our elements. We are talking about system-wide tests that we get data for that are applicable to our elements. We are talking about the engineering required for us to develop the specifications for the integration and interoperability, and so there was an awful lot of work that underlies the other element activities if we are going to achieve the vision of a BMD System against all threats.

Senator REED. When you talk about what the common Test Beds for the elements are, one would presume you know what your elements are, not perhaps fully defined, but to integrate something I think you have to have something to begin with, and a lot of your responses today are, we have not decided yet. We do not know. It could look like this.

General KADISH. Again, I think the assumption you are making that we do not know what we have so we cannot integrate it, or we do not know what we should integrate if we do not have it, is incorrect because it is a multifaceted problem. We have a situation where we will specify integration requirements that elements have to adhere to as well as taking where they are and integrating them with the basic specifications they are already working under, and so it is a mixed bag of things that have to be done, and we need the best talent we can find to do that, because it is very complicated.

Senator REED. Senator Allard.

Senator ALLARD. Thank you, Mr. Chairman.

Based on the Chairman's excitement over this program, I think I have to ask this question. If Congress were to give you more dollars, could you spend them?

General KADISH. Yes, sir, I could.

Senator ALLARD. I guess the bottom line in missile defense is do you have some unfunded requests?

General KADISH. We have tried to strike a balance to do all the things that we think we need to do to bring this development program in. There will always be unfunded requirements of different parts of the structure because time passes and we learn more about it, and we may have missed the mark on certain levels of funding for certain things. It is a continuous process of adjustment, so I do not think you would find the answers different from any program brought before you. If you asked, are there unfunded requirements, the answer would be yes, but we think we have the priorities set correctly.

Senator ALLARD. Can you provide me at least with some of those unfunded requests, prioritized?

General KADISH. Certainly, Senator. We can do that.

[The information referred to follows:]

We have tried to strike a balance to do all the things that we think we really need to do to bring this program in and we think we have the priorities set correctly. However, in balancing what we can do, invariably there are activities where

we could use additional resources. In addition, conditions change as time passes and we find that there are opportunities we were not fully aware of at the time of the President's budget request that could use budget-year resources. Based on our current view of potential unfunded requirements, we show potential funding shortfalls in SBIRS-Low for $50 million.

Secretary ALDRIDGE. Can I just make one point here? There is a funding profile that is laid into the budget, and as we have talked about the various boost phase, midcourse, terminal phase, and the ranges of missiles we have to defend against, there are multiple technologies that are associated with each of those elements, and some of those technologies are going to work, and some are not.

When we got the Navy Area, there was some funding that was reduced. We reallocated some of that funding back to other priorities. That will happen in the budget as we go forth, and then it may be we get to the point of deployment, one of the technologies is not working, there are funds available to maybe reallocate to the deployment from the missile defense budget. It may not have all of it, but I think we have to anticipate, as we go over with time, these funding profiles will change as programs succeed and some fail.

The way we have laid out the program, we should expect some of those to happen. We should expect some failures, we should expect some high successes, and when we do, we reallocate that funding, and so to say that there is a program profile that starts in fiscal year 2003 and goes to fiscal year 2007, and that is exactly what you are going to do, may not be the case. It may be that something changes as time goes on, and we should expect that.

Senator ALLARD. I appreciate candid remarks on that from both of you, because I think that adds credibility as far as your request before Congress.

Now, one thing I did want to clarify for the record, there is the THAAD request. I understand that includes a request for 10 additional missiles, and for the record I just wanted to clarify that these are test missiles, is that correct?

General KADISH. That is correct, Senator. We have a little bit of confusion in this terminology between contingency and test. The request is for test missiles for test purposes.

You will also see in the documentation that, even though that is the primary use, we may use them all up in tests, but if an emergency arises, a theme throughout the entire program is that we may use our test assets for operational use, but primarily they are test assets, and bought for that purpose.

Senator ALLARD. I want to move to a couple more questions, and I think we will just wrap it up on my side, Mr. Chairman. The ABL, I believe personally that the ABL is still a very important effort, is that working out on the scheduling for ABL?

General KADISH. Senator, we basically have gotten the responsibility for ABL because it is so important to missile defense purposes. In that process, as with any development program, we took a hard look at what the schedule was, what risks were involved, and we have adjusted the schedule with the moneys required to handle that adjustment.

I think it is absolutely remarkable the progress that program has made, with its very revolutionary technology, but we have those

struggles in the development program, and they are complex, but I am very confident at this point we know as much as we can know about the reasonableness of that schedule. I have good confidence in our ability to estimate that.

Now, as time goes on, whether that schedule will actually come to fruition is the trick in this business. I cannot guarantee we are going to meet it, but we have the best handle on it that we can have on it today. I have confidence we are on track to meet it.

Senator ALLARD. So the plane is pretty close to flying, or is it flying yet?

General KADISH. There are two parts of that flying equation. The first part is the first flight of the aircraft without the mission equipment operational. I think that will occur hopefully in June, probably in July of this year, and then the first shootdown, which would occur in the fall of 2004, if not earlier, should we have some successes in the early testing, so that is what we are working on right now.

Senator ALLARD. On the Space-Based Laser (SBL), obviously I was pleased, I mentioned earlier, with your demonstration, but can you comment a little bit on the next generation as far as the SBL? I know Senator Inhofe asked that question. Is there further comment you want to make on that particular program?

General KADISH. We took a funding reduction in last year's appropriation for the SBL experiment that we had ongoing in 2012, and that reduction was significant enough for us not to be able to make that experiment work, so what we have done in this budget is bring the SBL activities back down to technologies that we are trying to put together to support that, and we will be looking for the way ahead with the actual experimentation here over the next year or so with Secretary Aldridge, but no decisions have been made how to recover that experiment yet.

Senator ALLARD. Thank you, Mr. Chairman.

Senator REED. Thank you. Let me just pursue a few final questions following up on Senator Allard's questions about the Airborne Laser. You now hope, I believe, to test in 2005 a laser on a prototype aircraft, is that correct?

General KADISH. No, that is not correct. I think we are heading towards testing in calendar year 2004, the fall of calendar year 2004, with a half-power laser, that is correct.

Senator REED. When do you expect to have a full-power laser capable of testing and deployment?

General KADISH. As soon as we can do it, Senator, but I cannot give you a date right now. A lot will depend upon how successful we are marching to that 2004 date with the half-power laser. The achievement which that represents is rather significant. Whether it is half-power or full-power is an issue with the operational capability of the airplane, but the very fact that we could achieve a shootdown of any magnitude with that particular power laser is a major technical accomplishment.

Senator REED. With respect to Navy Theater-Wide, General Kadish, there has been the need to develop radar for the theater-wide system, and there has been a debate about the X-Band radar and alternative radars. Are you committed to developing an X-

Band radar for the Navy theater-wide radar, or now the sea-based midcourse system?

General KADISH. I do not believe I am committed to do anything in terms of the selection of those radars at this point in time. I think one of the things you have to understand as we begin to look at the environment outside the treaty constraints, is that one of the things we are looking very hard at is the value of having autonomous radars, integrated into a shooting system, if you will, and relying only on those radars. The treaty will allow us to look at off-board cuing and different types of configurations of sensors, so it throws a different light on the selection that we might have with any particular technology.

However, I will say this. We have had ongoing for many years a development program with what we call S-Band radar which is already on the Aegis cruiser, and then the X-Band, that gives us better discrimination capability for missile defense efforts, and we have to decide what to do about that.

We have funded the programs, I believe, in the 2003 budget for continuation, but we have some big decisions. We would recommend to Secretary Aldridge, probably in the next 6 to 8 months, in the 2004 deliberations on exactly which way we are going to go.

Senator REED. Last month, the Navy announced a contract worth $420 million to develop an S-Band radar component for sea-based midcourse defense. Why would the Navy be initiating this contract rather than the Missile Defense Agency?

General KADISH. We still have components of our program being managed by the different Services. What has changed in the Missile Defense Agency management structure is that now we have direct control of the programs through the Services, as before they were reporting through different chains to the Services using our dollars allocated by Congress.

So it is a different management structure, but you can expect that the Services, where they are doing that work on our behalf, will be letting the contracts. Some will be let out of the Missile Defense Agency direct. Some will be done by the Services.

Senator REED. A final question. We have talked before about countermeasures, and General Welch is leading your efforts on the countermeasures. How much are you requesting this year in terms of funding for research on countermeasures?

General KADISH. I would like to take that for the record, but when you say research on countermeasures there are different ways we can answer that question, and we will try to do it for the record. If you are talking about dollars spent on actually developing the countermeasures themselves to test against, that is one number. If you are talking about the additional dollars that we are spending to develop our systems to deal with those countermeasures, that is a different number, and a lot harder to segregate, because we do that altogether in our development program, but it is a major part of our development effort to deal with countermeasures.

[The information referred to follows:]

In the fiscal year 2003 President's budget, the Missile Defense Agency's planned spending for countermeasure/counter-countermeasure research and development is $219.967 million. The planned allocation of the requested funds is:

$72.013 million—PE 0603880C BMD Systems, 1050 Advanced Concepts
$60.279 million—PE 0603175C BMD Technology, 6010 Advanced Technology Development
$30.000 million—PE 0603882C Midcourse Defense Segment, 3050 Common SE&I
$26.475 million—PE 0603880C BMD Systems, 1030 Targets and Countermeasures
$30.000 million—PE 0603880C BMD Systems, 1060 Test and Evaluation
$1.200 million—PE 0603880C BMD Systems, 1050 Intelligence

Secretary ALDRIDGE. Just a comment. The concept that we have applied for missile defense, which is looking for boost phase, midcourse, and terminal phase by itself is a countermeasure program, because it is very difficult for any adversary to build countermeasures to deal with each one of those phases. In the boost phase you do not have to worry about warheads or decoys. You try to go after the booster. There is very little they can do for countermeasures. During midcourse phase there is a different set of circumstances. Terminal is another set of circumstances.

So by the way we are designing the program—and of course we are employing spiral development of the capability with time—it has a natural countermeasure sense to the program that I think is important for us to realize.

Senator REED. Senator Allard, do you have any more questions?

Senator ALLARD. No, thank you, Mr. Chairman.

Senator REED. If there are no further questions, we will recess the hearing. Thank you.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JACK REED

NEED FOR FOREIGN-BASED RADARS

1. Senator REED. General Kadish, during the hearing you stated that foreign radars were necessary to provide for adequate missile defense coverage if SBIRS-Low was not deployed. I understand, however, that a recent Pentagon study showed that a combination of new and existing radars, all based CONUS, would provide adequate coverage for a national missile defense system. Could you please clarify why you asserted at the hearing that foreign radars were necessary, given the results of the recent study?

General KADISH. If the Space Based Infrared System (SBIRS)-Low is not deployed, a Ballistic Missile Defense (BMD) system consisting of non-U.S.-based radars is necessary to provide adequate coverage.

The referenced study is the Missile Defense Agency's (MDA) SBIRS study directed by the Program Decision Memorandum (PDM). The study states that a Ground-Based Midcourse (GMD) missile defense system is effective against the less sophisticated threats that rogue nations could pose in the near term. The study also states that in addition to CONUS-based radars, non-U.S.-based radars would be needed to handle more challenging threats.

Ground-based radar is inherently limited to line-of-sight, restricting range and delaying acquisition of the threat target until it rises above the radar horizon. The more time the BMDS has to evaluate the target, the better discrimination and targeting will be. Radars based overseas extend the horizon and the time available for defenses to mitigate the impact of evolving adversary countermeasures. An effective defense requires that threat missile complexes be observed soon after the last rocket stage burns out. In the absence of SBIRS-Low, only radars based beyond CONUS borders can do this.

PRESIDENTIAL ALLOCATION OF FUNDING

2. Senator REED. Secretary Aldridge, the Fiscal Year 2002 National Defense Authorization Act reduced the administration's 2002 ballistic missile defense request by $1.3 billion, and then made that amount available for combating terrorism or ballistic missile defense. The act required the President to determine how to use the

$1.3 billion, based on the national security interests of the United States, and required the Secretary of Defense to submit to Congress a report describing the Secretary's plan for use of the funds. Has the $1.3 billion been allocated by the President, and if so, what is the status of the report to Congress?

Secretary ALDRIDGE. Congress chose not to appropriate funds in a manner that would have required the allocation contemplated by Section 1010 of the Fiscal Year 2002 National Defense Authorization Act. Therefore, the authorization has not been allocated.

PROCUREMENT OF MISSILE DEFENSES

3. Senator REED. General Kadish, how early could we begin procuring missile defense systems for deployment, and which systems might we buy?

General KADISH. This budget request contains funds for the Patriot Advanced Capability (PAC–3) production, so we have already begun the process. We have not, however, completed our Block 2004 and 2006 definition and configuration that will provide the basis for any future production decisions.

Based on continued testing success and capability assessments, we could procure small quantities of the Theater High Altitude Area Defense (THAAD), as well as a rudimentary ground- or sea-based midcourse capability in 2005–2006.

The GMD test assets we are acquiring for use in the BMDS Test Bed are just that, for testing, with the potential for contingency employment. They are not operational systems for deployment.

FISCAL YEAR 2002 FYDP DATA

4. Senator REED. Secretary Aldridge, one of the principal ways we use to understand a new budget is to compare it to the old one. For programs such as missile defense with long development times, it is critical to understand the budget for the outyears as well as for the next year. To help our understanding, the Department of Defense invariably presents last year's 5-year budget plan, or Future Years Defense Program (FYDP), as it is called, along with this year's FYDP, so comparisons can be made. I understand that this was, in fact, done this year for virtually all defense programs except for MDA programs. Could you please provide last year's FYDP for all MDA programs and projects to help us complete our review of the fiscal year 2003 budget submission?

Secretary ALDRIDGE. The Fiscal Year 2002 Ballistic Missile Defense Organization (BMDO) budget was originally prepared and submitted by the previous administration for $4.5 billion. The current administration revised the fiscal year 2002 ballistic missile defense budget and program significantly during last summer. That revised fiscal year 2002 budget request was $7 billion and was submitted during June 2002. The Department did not issue fiscal guidance for fiscal years 2003–2007 until August 2002, so no official out-year fiscal information was available to support the amended request.

Other DOD programs may have been able to provide approximate out-year detail for the amended budget, but this data is unofficial and would closely match current planning figures only because those programs were not substantially revamped last summer. However, at the time the amended budget was submitted, BMDO was still exploring, with the Department, alternative BMD programs plans, strategies, and funding levels for fiscal years 2003–2007. Refinement of these strategies and plans continued until submission of the fiscal year 2003 budget request.

OBLIGATIONS AND EXPENDITURES DATA FOR MISSILE DEFENSE PROGRAMS

5. Senator REED. General Kadish, reporting of obligations and expenditures data for current and previous years is one way to gauge the top-level health and progress of a program. Such obligations and expenditures data are typically provided to Congress as part of routine staff briefings by DOD program managers. However, they were not presented this year for MDA programs. Could you please provide obligations and expenditures data and projections for each budget project in the MDA for fiscal years 2001 and 2002?

General KADISH. See attached charts.

FY01 MDA OBLIGATIONS AND EXPENDITURES

Program Element	Approp Amount	Program Amount	Released by OSD	Actual Obligations	End 2nd Yr Oblibations	Actual Expenditures	End 2nd Yr Expenditures
PAC-3 (Proc)	365.457	357.692	357.692	238.487	224.273	70.664	186.000
TMD BMC3 (Proc)	3.975	8.347	8.347	3.106	5.234	0.968	4.340
NMD (Proc)	74.530	rescinded	0.000	0.000	0.000	0.000	0.000
PRMRF	4.772	6.129	6.129	6.128	6.129	6.128	5.087
MEADS	53.475	49.700	49.700	49.259	49.700	44.584	41.251
INTER COOP PROGS	130.992	125.805	125.805	124.506	125.805	109.460	104.418
THAAD	549.945	530.432	530.432	524.921	530.432	505.849	440.259
NMD	1875.238	1819.621	1819.621	1741.377	1819.621	1392.805	1510.285
FOS E & I	231.248	227.965	227.965	218.101	227.965	156.226	189.211
BMD TECH OPS	313.218	307.943	307.943	294.257	307.943	213.768	255.593
THREAT & CM	22.621	25.953	25.953	24.670	25.953	15.869	21.541
SPT TECH ATD	132.049	130.616	130.616	123.300	130.616	73.140	108.411
NAVY THEATER WIDE	462.671	440.997	440.997	416.096	440.997	210.052	366.028
NAVY AREA	274.234	267.453	267.453	251.928	267.453	160.847	221.986
SBL	74.537	69.595	69.595	65.344	69.595	53.794	57.764
SPT TECH EXP	56.247	31.219	31.219	28.237	31.219	14.556	25.912
PAC-3 (RDT&E)	81.016	81.892	81.892	72.897	81.892	30.473	67.970
SMALL BUSINESS (SBIR)		89.104	89.104	53.247	89.104	20.389	73.956
MILCON	103.518	48.303	48.303	39.652	42.362	17.100	35.744
UNDISTRIBUTED REDUCTION	(14.000)						
	4795.743	4618.766	4618.766	4275.513	4476.292	3096.672	3715.756

Notes:
1) Obligation and Expenditure data as of 31 December 2001.
2) Program Amount equals Appropriation Amount less Congressional reductions to include SBIR.
3) Cases where Program Amount is greater than Appropriated Amount represent below threshold internal reprogramming.
4) Actual PAC-3 (Proc) EOY Obligations will exceed $300M since execution is already ahead of plan.
5) The FY01 MILCON Appropriation was subsequently reduced by a $55M recission in the FY02 Military Construction Appropriation.

FY02 MDA OBLIGATIONS AND EXPENDITURES

Program Element	Approp Amount	Program Amount	Released by OSD	Actual Obligations	Forecast End 1st Yr Obligations	Actual Expenditures	Forecast End 1st Yr Expenditures
THAAD	872.481	846.901	846.901	627.886	823.317	71.740	452.800
NAVY AREA	100.000	96.184	96.184	61.106	97.700	30.706	64.500
BOOST SEGMENT	608.863	587.824	587.824	349.172	567.847	36.065	300.400
MIDCOURSE SEGMENT	3820.534	3675.994	3475.994	1600.662	3444.897	319.028	2276.114
SENSORS SEGMENT	340.600	319.610	319.610	115.421	301.804	27.647	187.600
PRMRF	6.571	6.571	6.571	2.050	6.571	2.050	6.571
BMD SYSTEM	819.084	793.062	793.062	244.524	743.354	26.398	397.000
PAC-3 (RDT&E)	129.100	131.415	131.415	20.145	112.455	4.580	85.218
BMD TECHNOLOGY	141.090	140.799	140.799	17.706	115.652	4.160	61.500
MGMT HQ--BMDO	27.758	25.673	25.673	2.608	25.673	1.178	25.673
TERMINAL SEGMENT	203.344	193.308	193.308	10.857	178.106	4.304	131.500
SMALL BUSINESS (SBIR)		145.102	145.102	0.000	129.141	0.000	60.943
PAC-3 (Proc)	736.574	731.455	671.455	53.407	241.380	4.751	160.920
MILCON	8.299	8.169	8.169	0.000	6.355	0.000	2.451
UNDISTRIBUTED REDUCTI	(39.000)						
TOTAL	7775.298	7702.067	7442.067	3105.544	6794.252	532.607	4213.190

Notes:
1) Obligation and Expenditure data as of 28 February 2002.
2) Program Amount equals Appropriation Amount less Congressional reductions to include SBIR.

NMD COUNTERMEASURES

6. Senator REED. General Kadish, there are a number of simple countermeasures discussed by organizations and individuals such as the Pentagon's Director of Operational Test and Evaluation, the Independent Review Team previously led by General Welch, and others. The most notable of these include tumbling re-entry vehicles with tumbling conical balloon decoys, and re-entry vehicles disguised by simple balloons. Are you aware of these?

General KADISH. Yes.

7. Senator REED. General Kadish, how do you intend to defeat such countermeasures with a midcourse system and do you intend to flight test against all of these countermeasure types, and if so, when?

General KADISH. MDA, with special focus on its GMD activity, has implemented countermeasure and counter-countermeasure processes to ensure the BMD System can negate not just simple threat countermeasures, but will continue to develop the BMD System to counter more complex threat countermeasures as they evolve.

The approach the Department has taken towards missile defense is to have redundant capabilities by deploying different elements. The BMD System will consist of elements configured into layered defenses to provide autonomous and mutual support, including multiple engagement opportunities, along a threat missile's flight path. Common sense tells us that the more shots we can take, the better will be our overall chance of success. It will also make it more difficult for the enemy to use countermeasures against us, because he will have to design countermeasures for the midcourse stage of flight, as well as the boost and terminal stages of flight.

The capability-based, block delivery approach to development of the BMD System has been formulated to take the greatest advantage of available countermeasure and counter-countermeasure technology. The MDA Targets and Countermeasures project funds targets and countermeasures in support of BMD programs, including the GMD element. Major efforts include maintaining a required inventory of major target components such as boosters, reentry vehicles countermeasures, and developing and incorporating countermeasures into targets for testing against BMD elements and components.

The MDA countermeasure/counter-countermeasure effort identifies and prioritizes solutions to credible countermeasures and incorporates robust testing against a broad range of threats. Results of the testing program help develop additional algorithms to mitigate these threats. Threat estimates are being changed from point-designs to capability-based. Solutions with potential counter-countermeasures effectiveness will be evaluated through the MDA Red-White-Blue team process for incorporation by block upgrades into the midcourse segment (both ground and sea).

A key element of our counter-countermeasures program is Project Hercules. This is a national effort to develop a broad range of robust, adaptive, physics-based algorithms designed to defeat nominal and off-nominal deployments of reentry vehicles and associated countermeasures. The initial focus of Project Hercules has been midcourse discrimination for the GMD element. In fiscal year 2002, Project Hercules expanded its scope to include all phases of missile flight. In cases where credible countermeasures discussed by outside reviewers in the unclassified community were not already under investigation by Project Hercules, the Project has focused resources on mitigations strategies.

For the midcourse BMD elements, in fiscal year 2002, MDA initiated advanced development of discriminating seeker components including multicolor focal plane arrays and laser radars, as well as beginning advanced development of transportable discriminating radar and miniature kill vehicle concepts. These efforts will continue in fiscal year 2003. Additionally, interactive discrimination concepts are being pursued.

MDA plans to test all BMD elements and BMDS blocks against a variety of increasingly complex countermeasures. While definitive flight testing dates have not been set, this testing will evolve as the initial GMD parts of the BMDS Test Bed are developed and constructed.

8. Senator REED. General Kadish, how much funding are you proposing in fiscal year 2003 to develop counter-countermeasures to these simple types of countermeasures?

General KADISH. The BMDS budget for fiscal year 2003 includes $153 million to fund efforts related to the development of counter-countermeasures. The GMD portion of that is $30 million.

ABL COUNTERMEASURES

9. Senator REED. General Kadish, the ABL is a revolutionary technology that could give this country a powerful defense against both theater and possibly long-range ballistic missiles. However, as with all technologies, there are countermeasures that could be used by an adversary. For the ABL, some of these potential countermeasures are quite simple, such as reflective paints. The National Defense Authorization Act for Fiscal Year 2000 required the Department to set up a countermeasures test and evaluation effort for the ABL. What is the current status of that

program, and how much funding does that program have this year and how much funding do you propose for this program for fiscal year 2003?

General KADISH. The Directed Energy Countermeasures Assessment Team (DECAT), set up while the ABL program was under Air Force management, continues to be the only countermeasures effort for ABL. With the transition of ABL to the MDA, the ABL program will continue the DECAT effort and will also rely on the MDA Targets and Countermeasures and MDA Test and Assessment offices for internal countermeasure analysis. MDA did not fund any independent analysis of countermeasure for ABL in fiscal year 2002 or fiscal year 2003.

10. Senator REED. General Kadish, what products are planned for this effort in fiscal year 2002 and fiscal year 2003?

General KADISH. We would be glad to address this effort in a classified briefing at your convenience.

11. Senator REED. General Kadish, in 1998, the Department set up a DECAT to evaluate potential ABL countermeasures. Does this team still exist, are its members the same, and how have the results of the DECAT been folded into ABL designs or operations?

General KADISH. The DECAT continues to function and its membership is unchanged. How the results of the DECAT have been folded into ABL design will be answered in a classified briefing at your convenience.

ABL FUNDING INCREASE

12. Senator REED. General Kadish, both the fiscal year 2002 and the proposed fiscal year 2003 budgets for the ABL have had $200 million increases from the previous year. The fiscal year 2003 budget also indicates that the first test of the ABL has slipped by a year, to fiscal year 2005. What specific technical challenges have caused the program to slip and why do you need another large funding increase for the program?

General KADISH. The technical challenges that caused program slippage include additional time and effort to incorporate lessons learned from the January 2002 Laser Module 1 test that produced 118 percent of expected power. Furthermore, the original vendors supporting coatings in beam control optics turned to commercial markets, and additional time was needed to find and qualify new competent vendors. Finally, the test schedule, cramped because of these delays, had to be restructured to allow sufficient time both for the conduct of each test and analysis between tests.

Funding increases reflect this program stretch out, as well as added work to structure the program into block increments of increased capability for integration into the BMDS.

In addition, the fiscal year 2003 budget request reflects the incorporation of a more robust advanced technology development effort to include a system integration laboratory (SIL) at Edwards AFB. The SIL will be used to prove out and mature technologies as well as troubleshoot any issues on the Block 2004 system and subsequent blocks to reduce risk, provide phased build-up of the Iron Bird, and address lethality.

Both the fiscal year 2002 and fiscal year 2003 budgets fund additional spares for the optical and laser systems to reduce schedule serialism and risk of excessive schedule delays during integration and testing.

- Beam control efforts include critical beam transfer assembly flight spares, duplicate flight processor diagnostic system, flight processors, and spare flight turret ball assembly components.
- Laser efforts include additional plumbing, integrating support structure, optical hardware, electronics and actuators, fluid products, turbopump, gain generator subsystem, singlet oxygen generator, pressure recovery subsystem, and mechanical hardware.
- Test and Integration funds provide for hardware and software for secure communications system throughout the ABL test facilities.

13. Senator REED. General Kadish, how much of this funding is needed specifically to work on the technical challenges that need to be solved in order to get the first test aircraft to actually work, how much is for other activities, and what are those activities (e.g., design and purchase of a second aircraft)?

General KADISH. For fiscal year 2003, total ABL funding request is $598 million; $338 million is for the first aircraft, Block 2004.

- $280 million will be used for the Block 2004 contract efforts
- $58 million in government costs associated with Block 2004 test operations at Edwards AFB, modeling, simulation, and analysis, target purchases for the Block 2004 aircraft, and program office operations
- $105 million is budgeted for the Block 2008 efforts to include completing a system requirements review and preparation of the preliminary design
- $50 million for the systems integration laboratory
- $20 million for advanced technology development
- $55 million for long lead components for Block 2008
- $30 million for the initial payment on the Block 2008 aircraft

ABL TARGETS

14. Senator REED. General Kadish, according to your budget documents, a total of 18 target missiles are to be bought for the ABL between fiscal year 2002 and fiscal year 2003. Please identify for which test each of these targets is being bought, state the purpose of the test, and the currently planned date for the test.

General KADISH. The MDA reduces risk inherent in this unprecedented and revolutionary development effort by incrementally building and testing segments until the ABL weapon system is completely integrated and tested. Using this approach, we will "build a little, test a little." The target set ABL will use has been developed in order to meet the requirements for verification of element performance. Each series of tests has a unique set of technical verifications for the specific segment being tested.

Missile Targets

15 Lance missiles will be used in a number of tests:

1. *Battle Management Command, Control, Communications, Computers and Intelligence (BMC^{4}I)* to verify the proper operation of the active Ranging System (ARS) and Infrared Search and Track (IRST) systems by tracking the Lance upon boost and comparing data to range tracking data.
2. *Beam Control/Fire Control (BC/FC)* to ensure ABL fine tracking capability (tracking illuminator laser (TILL)) and adaptive optics loop closure (beacon illuminator laser (BILL)) on a boosting missile target.
3. *Full-Up system* to ensure full system engagement against a boosting missile. No target data is collected. Tests ensure ABL runs the entire timeline through High Energy Laser (HEL) laze (HEL flash) with a boosting missile target (no destruction of target).

Three Terrier Lynx will also be used in multiple tests:

1. *BC/FC* to ensure ABL fine tracking capability (TILL) and adaptive optics loop closure (BILL) on a boosting missile target.
2. *A Full-Up system* to ensure full system engagement against a boosting missile. Tests ensure ABL runs the entire timeline through HEL engagement.

Together, the Lance and the Terrier Lynx bound Foreign Military Asset performance provide a full system demonstration against a realistic missile target threat. The progressive testing schedule is not yet firm. Currently the BMC^{4}I testing is scheduled for 1QFY03. All other testing is scheduled for 4QF04–1QFY05 timeframe.

NAVY THEATER-WIDE RADAR DEVELOPMENT

15. Senator REED. General Kadish, your budget documentation for last year indicated you planned to spend $67 million in fiscal year 2002 on X-Band radar development for Sea-based Midcourse. Do you still plan to spend that amount in fiscal year 2002 on X-Band development for this program and if not, what amount do you now plan on spending in fiscal year 2002?

General KADISH. Congress made an unspecified $100 million reduction in the fiscal year 2002 budget for the Sea-based Midcourse Program Element. MDA spread the $100 million reduction across the program element, which resulted in X-Band radar development funding being reduced from $67 million to $12 million.

16. Senator REED. General Kadish, how much do you propose to spend for X-Band development for Sea-based Midcourse in fiscal year 2003 and what is the basis for this amount?

General KADISH. The fiscal year 2003 President's budget is $15 million for the fiscal year 2003 X-Band solid-state radar development. This figure is based on funding availability, as other elements require funding earlier in our program's development process.

ATTACKING BALLISTIC MISSILES BEFORE THEY LAUNCH

17. Senator REED. Secretary Aldridge, our experience with Unmanned Air Vehicles (UAVs) such as the Predator in Afghanistan has proven that we now have the capability to destroy moving targets, such as trucks and SUVs, with a high level of confidence. This experience indicates that were Operation Desert Storm to occur today, we would have much better success attacking Scud launchers than we did then. The benefit of getting the launcher is that there are far fewer launchers than missiles. How much funding is devoted to maximizing our ability to hit missile launchers before or after the launch of a missile, and who is in charge of developing the plans and technology for this? How is this effort coordinated with our missile defense efforts?

Secretary ALDRIDGE. We do have more capability now to destroy moving targets than we did during Operation Desert Storm; however, there are no single-point solutions to attacking such time-sensitive and mobile targets. The solution to the problem rests in an across-the-board increase in capability associated with intelligence operations, battle management, and attack execution to shorten the joint targeting cycle. The presence of persistent intelligence, surveillance, and reconnaissance (ISR) sensors and immediately available attack weapons are an important cornerstone to this capability. Although it is difficult to determine an exact funding amount across the entire spectrum of platforms and programs related to this capability, one can highlight a few programs related to this mission. For example, in the President's budget submission there is $230 million allocated across the FYDP for accelerated Unmanned Aerial Combat Vehicle programs and, as indicated in Program Decision Memorandum IV, there is significant funding allocated for Global Hawk and space-based radar across the FYDP. These programs will help to attain the persistent ISR required to detect and prosecute targets such as SCUD launchers. There is also funding allocated to increase the accuracy of our weapons by modernizing GPS ($727 million across FYDP) and fund Advance Concept Technical Demonstrations (ACTDs) that would, for example, arm the next generation of Predator with new capability.

All of the Services and unified commands, in coordination with the Joint Requirements Oversight Council (JROC), Defense agencies, and OSD (AT&L) are working to develop the plans and technology for our future capability. The Joint Theater and Missile Defense Organization is a key stakeholder in this process and plays a vital role in the DOD coordination of these issues.

FUNDING FOR NEW TECHNOLOGIES

18. Senator REED. General Kadish, besides the two new boost phase programs you started last year, how much of the requested fiscal year 2003 funding is being applied to new technologies that weren't previously being pursued under the previous administration and what is the basis for your technology program element funding level?

General KADISH. The program includes $12.3 million for new projects that were not pursued under the previous administration, and $34.7 million in additional intensified funding for projects, consistent with the changes in focus between the prior and current administrations, with the following breakout.

In fiscal year 2002, MDA realigned its technology program under Program Element 0603175C. This continues with the fiscal year 2003 request. The technology program is aligned to the BMD System's boost, midcourse, and terminal layers, with particular emphasis on boost-phase intercept and midcourse counter-countermeasures. In addition the program has been reoriented to conduct high-risk, high-payoff work intended to achieve breakthrough results, whereas previous efforts focused on nearer-term technology insertion for theater ballistic missile defense programs.

The fiscal year 2003 technology program includes $8.3 million for Boost-Phase Intercept, $2.0 million for interactive discrimination, and $2.0 million for long-range atmospheric (terminal) defense. The previous administration did not pursue these. The boost phase work includes $3.6 million for early launch detection and tracking; the balance of $4.7 million is for high-energy laser weapons work.

The fiscal year 2003 technology program also includes $12.0 million for Miniature Kill Vehicles, an increase of $11.0 million relative to the previous administration, and $14.2 million for Global Defense, an increase of $4.7 million that covers a $3.5 million active laser tracking project and $1.2 million for smaller efforts. Finally, the $19.0 million discriminating seeker program has been significantly reoriented towards technology insertion for midcourse defense against long-range threats.

The MDA Technology Program Element funding level is $121.8 million for fiscal year 2003. MDA deems this sufficient in view of the high-risk, high-payoff nature of this work and because a significant fraction of the MDA overall budget of $7.6 billion pays for technology work that is done under other Program Elements.

NAVY AREA PROGRAM TERMINATION

19. Senator REED. General Kadish, Navy Area was our only ballistic missile defense system to employ an explosive warhead to kill the target missile, rather than employing so-called "hit-to-kill" technology. Hit-to-kill technology requires extremely accurate aiming, which is difficult at best, and may not work against excessively maneuvering missiles, some of which we saw during Operation Desert Storm. What is your new plan to replace Navy Area, and do you plan on continuing the explosive warhead approach?

General KADISH. When the Navy Area program was canceled, the Under Secretary of Defense for Acquisition, Technology, and Logistics, USD (AT&L) tasked the Missile Defense Agency, in close consultation with the Navy, to address sea-based terminal ballistic missile defense capability as part of the integrated BMDS. We have completed an in-depth review of potential options for development and fielding of a sea-based ballistic missile defense capability. We assessed both explosive warhead and hit-to-kill options during this review and will provide you with detailed plans of the new effort upon departmental approval of the way.

FUNDING FOR EXTRA THAAD MISSILES

20. Senator REED. General Kadish, how much of the fiscal year 2003 funding request for THAAD is for production of extra missiles, or even radars, or other components that are not essential for the currently planned Block 04 flight test program of five flight tests, but will likely be available assets after the currently planned block 2004 flight test program ends in fiscal year 2006?

General KADISH. There is $40 million in fiscal year 2003 funding associated with the THAAD element allocated to acquiring 10 additional test configuration missiles for the BMDS Test Bed. These test missiles will include telemetry/safety instrumentation, which was originally planned to be acquired later in the baseline approach. Fiscal year 2003 funding is needed to meet a delivery schedule in fiscal year 2006 versus fiscal year 2008, as defined in the current baseline approach. There is no fiscal year 2003 funding for extra radars or other non-missile components that are not essential for the currently planned Block 04 flight test program of five flight tests.

SEA-BASED MIDCOURSE FLIGHT TESTS

21. Senator REED. General Kadish, your current budget documents indicate that three Sea-based Midcourse flight tests are planned for 2002. What is the total cost of the three flight tests planned for 2002?

General KADISH. The cost for each SMD flight test is as follows:

[In millions of dollars]

Target	9	(includes indirect target costs)
Test Conduct	6	(test planning, execution, and analysis)
SM–3 Missile	20	(recurring manufacturing)
Total	35	

The total cost for three flight tests is $105 million.

ALTERNATE BOOSTER PROGRAM

22. Senator REED. General Kadish, you have announced the award of a contract worth $425 million for development of an alternate booster for the Ground-based Midcourse program. How much funding are you proposing for this effort in fiscal year 2003 and when do you expect the alternate booster will be available?

General KADISH. We have asked for $216.3 million in fiscal year 2003 for Prime Contractor dual booster development.

Test Bed versions of the boosters will each be tested in two non-intercept tests beginning in 2003. Additionally, MDA plans to fly these vehicles against targets in Integrated Flight Test IFT–14 and IFT–15, planned for fiscal year 2004, respectively.

23. Senator REED. General Kadish, when do you expect the objective (vice the alternate) ground-based Midcourse booster to become available?

General KADISH. Test Bed versions of the dual objective boosters will be used for Integrated Flight Test (IFT) –14, –15, –16, and –17. The full objective boosters are planned for flight scheduled no earlier than late 2004.

24. Senator REED. General Kadish, are we also considering use of existing assets such as the Peacekeeper as an alternate booster and if so, when might they become available?

General KADISH. No. Missile stacks using various stages of the Peacekeeper combined with other stages were considered during the alternate booster competition by the bidders. They were eliminated from consideration because of performance, size, and system cost considerations.

Neither the Orbital Sciences nor Lockheed Martin configurations use Peacekeeper assets. Boeing has selected Orbital Sciences Corporation and Lockheed Martin Missiles and Space as its subcontractors for the GMD dual booster strategy. Orbital will build and integrate a second source booster vehicle using existing or slightly modified versions of existing Orbital boost vehicles. Boeing intends to have Lockheed Martin build and integrate a high performance boost vehicle (HPBV) configuration.

ACQUISITION AND TESTING OF ACTUAL FOREIGN COUNTERMEASURES

25. Senator REED. General Kadish, I understand that the BMDO used to fund a modest program to acquire and test actual foreign missile defense countermeasures. This program was known as QP. Is this program still being funded by the MDA and if so, how much funding is being provided in fiscal year 2002, and how much is proposed for fiscal year 2003? Alternately, if not, why not?

General KADISH. To date, there have been no fiscal year 2002 funds obligated toward QP. MDA representatives met with the Space and Missile Defense Command and the QP contractor on March 12, 2002. MDA is currently evaluating QP proposals and gathering internal information establish requirements for the remainder of fiscal year 2002 and fiscal year 2003.

PROGRAM MANAGEMENT FUNDING

26. Senator REED. General Kadish, your budget proposal for fiscal year 2003 funds program management-related activities such as systems engineering and integration, support, and program operations. What specific products are expected to be contracted for with this funding? Could you please provide a breakdown of the specific products, and each product's expected 2003 cost?

General KADISH. The fiscal year 2003 MDA Systems Engineering and Integration (SE&I) budget of $371.149 million funds Systems Engineering and Architecture (SE&A), Threat Systems Engineering (TSE), Advanced Concept, Intelligence System Threat, Joint Warfighter Support, Joint National Integration Center, Cooperative Programs and Allied Support, and BMD Information Management efforts. The funding and products for each of these areas is as follows:

- $192.307 Million Systems Engineering and Architecture/Threat Systems Engineering
  - Update the Ballistic Missile Defense System Technical Objectives and Goals and System Capability Specification.
  - Continue to define and develop the BMDS System Evolution Plans.
  - Continue to develop new/alternative concepts and conduct trade studies to support system evolution and risk mitigation.
  - Update standards and orchestrate activities across all BMDS elements to ensure system integration.
  - Continue the establishment of BMDS level criteria, metrics, and Technical Performance Measurement and assess progress, identify risks, support selection of alternatives, establish capability increments, and ensure system integration.
  - Maintain risk mitigation activities.
  - Continue to execute the Corporate Lethality program to support effective intercepts and establish collateral effects.
  - Conduct force-on-force level and detailed element level analyses to assess system effectiveness, ensure robust performance, and establish expected capabilities to incorporate in future blocks.

• Support analysis of system alternatives involving potential coalition partners that explore interoperability concepts, Battle Management/Command and Control (BM/C^2) alternatives, and associated engineering requirements.
• Continue to establish requirements for and provide engineering support to System verification and testing.
• Provide for the development and analysis of the BMD System architecture with multiple layers including boost, mid-course, and terminal intercept capabilities and employing multiple sensors integrated by BM/C^2 and Communications segments.
• Conduct the Corporate Countermeasures/Counter-Countermeasures (i.e. Red-White-Blue) program.
• Maintain an Adversary Capability Document definition necessary to support BMD System design, development, and testing.
• Maintain a number of reference scenarios illustrative of the threat space, for use in assessment of BMDS capabilities.
• Perform threat modeling and simulation to characterize the threat, providing digital data to support BMDS analyses.
• Update modeling and simulation capability and provide threat media to support analyses.
• Produce quick reaction assessments for the Director of potential impacts to BMDS capabilities.
• Support focused BMD efforts such as Project Hercules and targets and countermeasures.

- $79.501 Million Advanced Concepts

• Develop, evaluate, and promote integration of Advanced Concepts and Technologies into the BMDS.
• Mature advanced concepts to assess their viability for BMDS.
• Develop advanced technologies for missile defense.
• Maintain cognizance in leading edge concepts that could contribute to revolutionary BMD capability enhancements.
• Develop and improve decision and discrimination algorithms supporting the BMDS.
• Develop decision architecture for implementing the next generation BMDS BM/C^2.
• Define and lead the BMDS Battlefield Learning and Adaptation to respond to unexpected battlefield events.
• Lead Advanced Concept Studies as directed by MDA/D, DD, DT.

- $12.615 Million Intelligence Systems Threat

• Foreign missile characteristics and performance analysis.
• Foreign missile booster analysis.
• Foreign missile payload analysis.
• Foreign missile countermeasures analysis.
• Foreign missile signatures analysis.
• Foreign missile lethality analysis.
• Foreign missile proliferation analysis.
• Adversary Capability Document (ACD) support.
• Threat Description Document (supports the ACD).
• Capabilities-based Scenarios.
• Intelligence-based Scenarios.
• Scenario Modeling Software Updates/Maintenance.
• Intelligence assessments work.
• Scenario support.

- $16.407 Million Joint Warfighter Support

• Joint Warfighter Support Program provides BMD expertise to the Commanders in Chiefs (CINCs), brings Joint/Combined/Coalition lessons learned to the developer, coordinates block contingency deployment plans, engages CINCs in C^2 development, facilitates intra/inter theater CONOPS developments, facilitates program transition to Services, maintains interaction with the transitioned programs, and supports CINC BMD exercises, wargames, and tabletops. This will be done in fiscal year 2003 by funding the BMD portion of the following seven Theater CINC exercises:

  • Roving Sands 03 (JFCOM),
  • Reception, Staging, Onward Movement and Integration/Foal Eagle 03 and Ulchi Focus Lens 03 (USFK),
  • Juniper Cobra (EUCOM) for 2 years (03 and 04),
  • Terminal Fury (PACOM), and

- Lucky Sentinel and Eagle Resolve 03 (CENTCOM).

- $47.937 Million Joint National Integration Center
  - Operations of the Joint National Integration Center.
  - Environment, Information Management, and Facility Modernization.
  - BM/C^2 Development and Integration.
  - Exercise Support.
  - Support to Wargames and Wargames 2000.
  - Ground-based Midcourse Defense Interoperability, Multi-Mission Integration Cell, Theater Missile Defense Interoperability, Special Programs Center.
- $1.435 Million cooperative program and allied support
  - Develop and evaluate non-U.S. operational concepts created in conjunction with supported country.
  - Examinations of U.S. and foreign assets in extended air defense scenarios.
  - Develop potential foreign military sales opportunities.
- $20.947 Million information management systems
  - Wide area network management activities such as network security and continuity of Operations.
  - Contract support for Enterprise Information Architecture.
  - Enterprise information applications: email, collaboration tools, and enterprise portal.
  - BMD Data Center activities: Data storage, archival, retrieval.
  - BMD Information Resource Center.
  - Information Assurance Operations Center Definition and Testbed.
  - BMD Information Management/Information Technology Plans, Policies, and Analysis.

PROCUREMENT FUNDING

27. Senator REED. General Kadish, the MDA acquisition plans envision "transitioning" missile defense programs to the Services when they are ready. Once this happens, how will procurement funding across the FYDP be provided and will the Services be asked to fund the procurement of the missile defense system out of their top-line budget or will funding be transferred from the MDA budget to the Services?

General KADISH. In his Missile Defense Program Direction memorandum of January 2, 2002, the Secretary of Defense prescribes that the MDA is responsible for planning and budgeting for missile defense RDT&E activities and that the Services are responsible for budgeting for missile defense procurement and operations. MDA will share the responsibility for planning and budgeting during the Transition Phase with the appropriate Service. We will work with the Department to develop specific procurement alternatives for BMDS elements as part of our fiscal years 2004–2009 Program Objective Memorandum.

[Whereupon, at 4:53 p.m., the subcommittee adjourned.]

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2003

WEDNESDAY, MARCH 13, 2002

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

BALLISTIC MISSILE DEFENSE ACQUISITION POLICY AND OVERSIGHT

The subcommittee met, pursuant to notice, at 2:31 p.m., in room SR–222, Russell Senate Office Building, Senator Jack Reed (chairman of the subcommittee) presiding.

Committee members present: Senators Levin, Reed, Ben Nelson, Warner, Smith, Inhofe, Allard, and Sessions.

Committee staff member present: David S. Lyles, staff director.

Majority staff members present: Madelyn R. Creedon, counsel; Kenneth M. Crosswait, professional staff member; and Richard W. Fieldhouse, professional staff member.

Minority staff members present: Judith A. Ansley, Republican staff director; L. David Cherington, minority counsel; Brian R. Green, professional staff member; William C. Greenwalt, professional staff member; Mary Alice A. Hayward, professional staff member; and Thomas L. MacKenzie, professional staff member.

Staff assistants present: Leah C. Brewer and Thomas C. Moore.

Committee members' assistants present: Elizabeth King, assistant to Senator Reed; Richard Kessler, assistant to Senator Akaka; Peter A. Contostavlos, assistant to Senator Bill Nelson; Eric Pierce, assistant to Senator Ben Nelson; J. Mark Powers, assistant to Senator Inhofe; Douglas Flanders, assistant to Senator Allard; and Arch Galloway II, assistant to Senator Sessions.

OPENING STATEMENT OF SENATOR JACK REED, CHAIRMAN

Senator REED. Let me call the hearing to order. We will be joined shortly by Senator Allard, and I thank Senator Inhofe for joining us.

I want to welcome back Secretary Aldridge, Under Secretary of Defense for Acquisition, Technology, and Logistics (AT&L), and Lieutenant General Kadish, Director of the newly organized Missile Defense Agency (MDA). I would also like to extend a warm welcome to the Honorable Thomas P. Christie, Director of Operational Test and Evaluation (OT&E) for the Department of Defense.

Mr. Christie, you have a very important statutory role. You provide Congress and the American people the assurance that our military systems are well tested and that they are operationally effective before they are fielded to our fighting forces.

Last week, we had the opportunity to examine the significant budget request for missile defense. This is the second year in a row that there have been significant requests for missile defense budgets.

This week we focus on the sweeping changes in ballistic missile defense management and oversight that the Defense Department has begun to implement. These changes raise questions about whether there will be appropriate checks and balances for the Department's missile defense programs to help ensure both program success and the wise use of defense resources.

The most fundamental question is, are these changes necessary to produce effective ballistic missile defense as soon as practicable?

Every day we see the technological superiority of our Nation's fighting forces, the accuracy of our long-range weapons, the ability to provide incredibly detailed videos from above the battlefield in real time to command centers thousands of miles away, and the ability to fight nearly as well at night as we do in the day. All of these capabilities put us decades ahead of all of our nearest potential rivals and all of these capabilities were developed using our existing disciplined and proven policies for acquisition and oversight.

The second major question is, are the proposed changes consistent with maintaining meaningful congressional oversight over missile defense programs?

Congress by itself does not have the resources to oversee every individual military program in detail. That is why Congress codified in statute the roles and responsibilities of positions such as the one which Mr. Christie now fills and many others. It is clear that under the new rules for missile defense, these organizations will not be performing their traditional roles. One of the areas we will explore today is what roles, if any, these oversight organizations and others will play in the new Missile Defense Agency.

Before recognizing our witnesses, I would ask if Senator Inhofe or Senator Smith has an opening statement.

Senator INHOFE. Mr. Chairman, I do not have an opening statement. I am ready to go to the witnesses.

Senator REED. Thank you very much.

Senator Smith

Senator SMITH. I do not have one either. Let us go. [Laughter.]

Senator REED. Thank you, Senator Smith and Senator Inhofe.

Before we proceed to our witnesses, and without objection, I would like to place in the record at this point Secretary Rumsfeld's January 2, 2002, memorandum establishing the Missile Defense Agency, as well as Secretary Aldridge's two memoranda of February 13, 2002, providing plans and implementation guidance for the new agency. I do so because this information will, I think, be a significant part of the discussion at our hearing today and well in the future.

[The information referred to follows:]

SECRETARY OF DEFENSE
1000 DEFENSE PENTAGON
WASHINGTON, DC 20301-1000

JAN 2 2002

MEMORANDUM FOR DEPUTY SECRETARY OF DEFENSE
SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
UNDER SECRETARIES OF DEFENSE
ASSISTANT SECRETARIES OF DEFENSE
GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE
DIRECTOR OPERATIONAL TEST AND EVALUATION
COMMANDERS OF THE COMBATANT COMMANDS
ASSISTANTS TO THE SECRETARY OF DEFENSE
DIRECTOR, ADMINISTRATION & MANAGEMENT
DIRECTORS OF THE DEFENSE AGENCIES

SUBJECT: Missile Defense Program Direction

The Department last year conducted extensive and rigorous missile defense reviews to determine how best to fulfill the Nation's need to defend the U.S., deployed forces, allies and friends. The findings underscore the importance of layered defenses as well as the need for new approaches to acquire and deploy missile defenses.

The attached provides my key priorities and specific direction to execute the Missile Defense Program. My objectives are:

a. Establish a single program to develop an integrated system under a newly titled Missile Defense Agency (MDA).

b. Assign the best and brightest people to this work.

c. Apply a capability-based requirements process for missile defense.

d. Direct the MDA to develop the missile defense system and baseline the capability and configuration of its elements and the Military Departments to procure and provide for operation and support.

The full and cooperative efforts of the Services, Joint Staff, and defense agencies are essential to this goal. I ask that you give your full support to this national priority. I will look to the Senior Executive Council for oversight and recommendations for decision-making in this area.

Point of contact for this matter is Lieutenant General Ronald Kadish, Director, Missile Defense Agency.

Attachment:
As stated

Missile Defense Program Direction

This document provides the Secretary of Defense's priorities and guidance for the Department's Missile Defense Program. The following are the top four missile defense priorities for the Department of Defense:

a. First, to defend the U.S., deployed forces, allies, and friends.

b. Second, to employ a Ballistic Missile Defense System (BMDS) that layers defenses to intercept missiles in all phases of their flight (i.e., boost, midcourse, and terminal) against all ranges of threats.

c. Third, to enable the Services to field elements of the overall BMDS as soon as practicable. To that end, we have started to deploy the Patriot Advanced Capability-3 system this year, after successful testing, as the first line of defense against short-range missiles.

d. Fourth, to develop and test technologies, use prototype and test assets to provide early capability, if necessary, and improve the effectiveness of deployed capability by inserting new technologies as they become available or when the threat warrants an accelerated capability.

To enhance elevated national priority and mission emphasis, the Ballistic Missile Defense Organization (BMDO) is hereby redesignated the Missile Defense Agency (MDA). The Director, MDA will report directly to the Under Secretary of Defense (Acquisition, Technology, and Logistics) (USD (AT&L)).

To improve the leadership, management, and organization of missile defense activities, I direct the USD (AT&L) to take the following actions:

a. Establish a single development program for all work needed to design, develop, and test the elements of an integrated BMDS.

b. Develop for deployment, when directed, a useful military capability to detect, track, intercept, and defeat ballistic missiles in all phases of flight against all ranges of threats. Improve the BMD system through incremental improvements and block upgrades to BMDS elements over time.

c. Plan and execute work such that efforts in particular areas of the BMDS may be truncated or stopped if the results are unsatisfactory or where the development effort should be shifted to another integrated BMDS element to permit its acceleration.

d. Execute the program such that demonstrated capabilities can be fielded in limited numbers when available. Base production decisions on the initial performance of the BMDS as demonstrated through credible testing, availability of system alternatives, and consideration of threat evolution.

e. Adopt a flexible approach to the overall BMDS such that each BMDS element complements the others, supports deployment in differing combinations over time, and is open for international participation.

The special nature of missile defense development, operations, and support calls for non-standard approaches to both acquisition and requirements generation. As a development activity, the Missile Defense Agency will require some expanded responsibility and authority. I therefore direct the following:

a. To rapidly carry out my direction, streamlined executive oversight and reporting will be implemented. The Senior Executive Council (SEC), chaired by the Deputy Secretary of Defense, will, in addition to other responsibilities, provide policy, planning and programming guidance; oversee the Department's missile defense activities; and approve BMDS fielding recommendations. The USD (AT&L) will establish a Missile Defense Support Group (MDSG) of appointed department officials to advise the Director, MDA and support SEC decision-making. The chairman of the MDSG will report to USD (AT&L).

b. Management of the BMDS elements will consist of three phases: development, transition, and procurement and operations. The recommendation by Director, MDA for a BMDS element to move to the transition phase; and by the Defense Acquisition Board (DAB) to enter the procurement phase will be approved by the SEC along with budget and force structure levels.

c. To encourage flexible acquisition practices, I delegate to the Director, MDA, authority to use transactions other than contracts, grants, and cooperative agreements to carry out basic, applied, and advanced research.

d. The Secretary, with input from the SEC, will decide whether to use Research Development Test and Evaluation (RDT&E) assets for emergency or contingency deployment, based on assessment of military utility, progress in development and recommendation by the Director, MDA and Military Services.

e. The Director, MDA will manage the BMDS through the development and transition phases, and baseline the capability and configuration of its capability blocks and BMDS elements. The Departments of the Army, Navy, and Air Force will procure the BMDS elements and provide, with the Defense Agencies, for their operation and support.

f. The Director, MDA will work closely with the Commanders-In-Chief and Services throughout the development of the BMDS. Production quantities and operational force levels will be settled early enough in the development for an effective transition of responsibility. BMDS elements will enter the formal DoD acquisition cycle at Milestone C, concurrent with Service procurement responsibility transfer. USD (AT&L) will oversee all Service missile defense procurement phase activity.

g. Budgeting for RDT&E is the responsibility of MDA; budgeting for procurement is the responsibility of the Services.

h. The Under Secretary of Defense (Policy), as a member of the Missile Defense Support Group, will ensure international participation remains a key, long-term component of the missile defense program.

i. The Under Secretary of Defense (Comptroller)/Chief Financial Officer will develop within 120 days for the Deputy Secretary's approval, in coordination with the USD (AT&L) and the Director, MDA, a description of how the Department's Planning, Programming and Budget System process will be tailored for the missile defense program. The process will clarify the lines of authority, specific responsibilities and coordination requirements consistent with the intent of the authorities and responsibilities in this memorandum.

j. To reinforce the single-system focus, and to implement a successful transition to capability-based management, the BMDS program will not be subject to the traditional requirements generation process of CJCSI 3170. The current Service missile defense Operational Requirements Documents are not consistent with the proposed BMDS development program objectives and are hereby cancelled. However, the Director, MDA will establish a process that sets initial capability standards, engages the participation of future users early and throughout development, and permits capability trades across all BMDS elements. MDA will manage through System Technical Objectives and Goals and during the transition phase will baseline capabilities and configurations. During transition, the Services will develop a capability-based Operational Requirements Document (ORD) that will become operative upon transfer of capabilities to the Services. Throughout development, the military departments and the Joint Staff will provide guidance and advice on desired capabilities, operational approaches, and suitability and supportability features.

k. The Military Departments will provide forces, as needed, to support the fielding of early and/or contingency capability and will budget the resources to procure and operate the planned force structure. The MDA will continue to fund

and manage RDT&E activities for new missile defense capabilities and modifications to fielded systems.

l. The MDA is responsible for Developmental Testing and Evaluation (DT&E) of the BMDS and its elements. When a decision is made to transition a block configuration of an element to a Service for procurement and operation, an Operational Test Agent will be designated and an Operational Test and Evaluation (OT&E) will be conducted at the end of the transition phase to characterize the operational effectiveness and suitability of that block configuration of that element.

m. A DoD Force/Activity Designator (FAD) -1 priority is assigned for the BMDS and its elements.

n. The MDA will be staffed with our most-talented people through competitive nominations, selective personnel transfers, and recruitment. The Service Secretaries will assist in this effort. The Department will staff the MDA and program offices, both direct and matrix, at 100 percent of authorized levels. The Director, MDA will be the final authority for all personnel actions.

o. The Director, MDA will retain management responsibility for defining the overall BMDS and the interoperability standards for programs that transfer to the Services (e.g., Patriot Advanced Capability 3, Navy Area Theater Ballistic Missile Defense, and Medium Extended Air Defense System). The Services will ensure such systems remain interoperable, as defined by the Director, MDA, in the BMDS.

p. The Director, MDA will have all management authority and funding responsibility for the Space Based Laser, Airborne Laser and Space-Based Infrared System (Low) programs.

q. The Director, MDA will work with the designated Air Force DoD Executive Agent for Space to develop a seamless process that ensures close management, integration, and interoperability with existing and planned space systems.

Additionally, to affirm my commitment to rapidly capitalize on promising concepts and promptly adjust program priorities, I request the Deputy Secretary of Defense to ensure that decision-making cycle times are as rapid as possible for proposed executive decisions on missile defense. I will support additional or revised statutory authority as identified by the Director, MDA, to reduce development time and enhance program success.

THE UNDER SECRETARY OF DEFENSE
3010 DEFENSE PENTAGON
WASHINGTON, DC 20301-3010

ACQUISITION,
TECHNOLOGY
AND LOGISTICS

FEB 13 2002

MEMORANDUM FOR DIRECTOR, MISSILE DEFENSE AGENCY
SECRETARIES OF THE MILITARY DEPARTMENTS
ATTN: SERVICE ACQUISITION EXECUTIVES

SUBJECT: Ballistic Missile Defense Program Implementation Guidance

This memorandum provides my guidance to implement the direction Secretary Rumsfeld provided in his memorandum of January 2, 2002, subject: "Missile Defense Program Direction." Secretary Rumsfeld restated the Nation's need for establishing effective, layered defenses against ballistic missiles and established the Department's missile defense program as a top priority. He assigned responsibility for the program to the Director, Missile Defense Agency, (MDA) and tasked all Departmental components with helping to ensure the program's success.

To implement the Secretary's direction:

a. I direct the Director, MDA, to set up and carry out a single program of research and development work to develop the Ballistic Missile Defense System (BMDS). The BMDS program shall use a system-level management structure that integrates work and enables capability trades among BMDS elements and decisive action in response to program events.

b. I hereby assign responsibility and delegate full authority to the Director, MDA, to do the following:

(1) Plan and execute an evolutionary, capability-based acquisition approach to develop and deploy missile defense capabilities as soon as practical.

(2) Develop technologies supporting the BMDS, leveraging service technology efforts where applicable, baseline the system capability and configuration, assure the suitability and supportability of the developed system, and conduct developmental testing and evaluation. Support the conduct of capability-based operational testing.

(3) Obtain the advice of the warfighter community on desired operational features and approaches to system deployment. The Joint Theater Air and Missile Defense Organization (JTAMDO) will serve as the voice for the CINCs and Services and to lead the collaborative effort with the CINCs and Services on operational matters. JTAMDO will also develop operational concepts, develop the operational architecture, and assess military utility, during BMDS development and transition. Further, MDA will work closely with JTAMDO in developing the joint command and control architecture for the Ballistic Missile Defense System and integrating it into the applicable joint command and control architectures for air and missile defense.

(4) Manage program execution. This shall include authority to formulate acquisition strategy, make program commitments and terminations, conduct source selections, award contracts, analyze performance, make affordability tradeoffs, document the BMDS program of work, and report progress.

(5) Set up and carry out special access program activities to protect sensitive information and information networks, applying adequate procedures to maintain security.

(6) Exercise Milestone decision authority for the BMDS up to, but not including, Milestone C. Upon a recommendation from the Director, MDA, that the BMDS or a BMDS element should be considered for transition to production, and after approval by the Senior Executive Council (SEC), USD(AT&L) will establish necessary product teams to support a Milestone C decision by the DAB.

c. The Secretary by memorandum of January 2, 2002, determined that the current Service missile defense ORDs are not consistent with the proposed BMDS development program objectives and cancelled them. With the exception of PAC-3, the programs (but not the contracts) associated with these ORDs are hereby cancelled. All of the cancelled programs become elements of the single developmental program for the Ballistic Missile Defense System, which will be a Major Defense Acquisition Program (MDAP). The Army will reestablish a capability-based ORD for PAC-3, and MDA will take the steps necessary to transfer production and sustainment responsibility to the Army by FY03. Evolutionary development of PAC-3 will be part of the ballistic missile defense program. MDA will ensure that appropriate actions are taken consistent with applicable statutory requirements.

d. To advise the Director, MDA, on management of the BMD Program and the SEC in executive decision-making on missile defense, I will form a Missile Defense Support Group (MDSG) of designated senior experts from selected Department staffs. I will provide further guidance on the responsibilities of this group in separate correspondence.

e. The Director, MDA, working with the Services, shall develop transition plans (to include resources, contracting, personnel, and facilities) for the BMDS elements transferring into, or out of, MDA responsibility. The Services will bring Operational Requirements through the Joint Requirements Oversight Council as the system elements transition to the Services.

f. The National DX priority is assigned for all BMDS industrial acquisition activities including those activities executed by the Services.

Because of the special nature and priority of the BMDS program, it is important to implement a disciplined acquisition approach. The Director, MDA, shall submit within 60 days for my review a draft program implementation plan to address the following:

a. program structure with funding allocations;

b. the BMDS program baseline;

c. technical and program management structure (to include organizational changes and program transfer realignments);

d. acquisition strategy;

e. planned program documentation and reporting to OSD and Congress;

f. personnel ceiling adjustments including adjustments of Federally Funded Research and Development Centers (FFRDC) staff-year ceilings or reallocation to the MDA of sufficient FFRDC staff-years of technical effort required for the BMDS program;

g. selective staffing procedures and service support;

h. Service interfaces;

i. OSD, WHS, and Joint Staff interfaces;

j. approach to test and evaluation, including a plan for the potential use of prototype and test assets to provide early capability; and

k. transition plan for any BMDS element transferring into, or out of, MDA responsibility, including general criteria to guide the Director, MDA in recommending a program for transition.

The MDSG will review this implementation plan and provide its advice to me, the Director, MDA, before SEC final approval.

E. C. Aldridge, Jr.

THE UNDER SECRETARY OF DEFENSE
3010 DEFENSE PENTAGON
WASHINGTON, DC 20301-3010

ACQUISITION,
TECHNOLOGY
AND LOGISTICS

FEB 13 2002

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
UNDER SECRETARY OF DEFENSE (POLICY)
UNDER SECRETARY OF DEFENSE (COMPTROLLER)
VICE CHAIRMAN OF THE JOINT CHIEFS OF STAFF
ASSISTANT SECRETARY OF DEFENSE (COMMAND, CONTROL, COMMUNICATIONS & INTELLIGENCE)
GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE
DIRECTOR, OPERATIONAL TEST AND EVALUATION
DIRECTOR, MISSILE DEFENSE AGENCY
DIRECTOR, PROGRAM ANALYSIS AND EVALUATION
CHAIRMAN, COST ANALYSIS IMPROVEMENT GROUP

SUBJECT: Missile Defense Support Group

This memorandum sets out my plan to form a Missile Defense Support Group (MDSG) of appointed Department officials to advise the Director, Missile Defense Agency (MDA) and support Senior Executive Council (SEC) decision-making on the ballistic missile defense program. The chairman of the MDSG will be the Director, Strategic and Tactical Systems, who will report directly to me as the USD(AT&L) on MDSG matters.

The MDSG will consist of principals nominated by name from the respective offices addressed in this memorandum, in consultation with the MDSG chair and the Director, MDA, and approved by me. The MDSG members must be well informed to offer useful insights and recommendations on policy, operations, acquisition, and resource matters that affect the overall Ballistic Missile Defense System (BMDS). The MDSG is not a decision or approval body.

The MDSG Chair shall identify the Executive Secretary for the MDSG. The MDSG shall be supported by designated persons on the MDSG's members' staffs, who will have direct access to information on the BMDS, to include BMDS program information and execution progress, and will be invited to participate in program meetings. Because this access could include sensitive and special access program

information, support staff will be limited. They must be approved by me, by name, in consultation with the MDSG chair and the Director, MDA. MDA's Program Integration office will facilitate such access, and may also provide staff support for MDSG assessments. The designated supporting staff will be formed into an MDSG Working Group.

The objective of the Working Group is to promote the success of the BMDS by means of informed, constructive advice, both in support of the Director, MDA and the MDSG members, and in other processes within the Department, including the Planning, Programming, and Budgeting System. The Working Group will perform independent analysis and assessment, as approved by the MDSG. Because of expertise and continuity requirements, attendance at MDSG meetings will be limited to appointees and designated staff only. However, the MDSG Chair may call upon other offices to participate, as needed. Please provide your nominees for the MDSG and designated staff support to the MDSG chairman within seven days from the date of this memorandum.

The first task of the MDSG will be to review MDA's draft plan to implement Secretary Rumsfeld's Missile Defense Program Direction of January 2, 2002, and my subsequent implementation guidance. The MDSG will provide its advice regarding this plan to the Director, MDA, and me before we seek SEC approval of that plan.

Rapid decision-making and streamlined oversight will be key to the success of the Department's missile defense program. Consistent therewith, the MDSG shall play a continuing role by providing insights and advice throughout the development of the BMDS.

E. C. Aldridge, Jr.

Senator REED. Secretary Aldridge, welcome.

STATEMENT OF HON. E.C. "PETE" ALDRIDGE, UNDER SECRETARY OF DEFENSE FOR ACQUISITION, TECHNOLOGY, AND LOGISTICS

Secretary ALDRIDGE. Good morning, Mr. Chairman and members of the subcommittee. I again thank you for the opportunity to appear before you today to discuss the management and oversight of the Department of Defense's missile defense program.

On January 2 of this year, Secretary Rumsfeld issued his direction to the Department for the missile defense program. His stated objectives included the establishment of a single program to develop an integrated Ballistic Missile Defense System (BMDS) under the authority of a single organization, the Missile Defense Agency.

Mr. Chairman, I have a written statement I would submit for the record, and I will briefly summarize it today.

Senator REED. Without objection.

Secretary ALDRIDGE. Redesignation of the Ballistic Missile Defense Organization as the Missile Defense Agency provides greater authority to Lieutenant General Kadish and his staff to manage the rigorous and complex technical challenges associated with developing missile defenses.

Ballistic missile defense requires scientific and engineering breakthroughs on many different fronts at once, launches from both land and sea, space-based, ground-based, and vehicle-based sensors, warning satellites, lasers, hit-to-kill systems, decoy discrimination, and guidance and targeting systems that have to be accurate within inches at closing speeds of 20,000 miles per hour impacting their targets thousands of miles from where they were launched. We have to integrate all these systems into one system requiring extraordinary computing power and communications capabilities that must themselves be safe from interference and attack.

The Secretary of Defense directed the use of a streamlined oversight process for the BMDS, and he has indicated his intention to look to the Department of Defense Senior Executive Council (SEC) for oversight and recommendations for decision making in this area. The SEC is chaired by Deputy Secretary Wolfowitz and includes the Service Secretaries and myself.

In turn, I recently issued implementation guidance based on Secretary Rumsfeld's direction. I tasked the Director of the Missile Defense Agency, who reports to me, to plan and execute a single missile defense program, structured to integrate work and enable capability trades across different elements of the Ballistic Missile Defense System and to facilitate decisive action in response to program events.

To advise the Director of MDA on management of the missile defense program, and to aid the SEC in executive decision making on missile defense, I have formed a Missile Defense Support Group (MDSG) which consists of 13 designated senior experts from selected staffs within the Department. They will be supported by a working group of individuals from their support staffs. The Chairman of the Missile Defense Support Group is the Director of Strategic and Tactical Systems, Office of the Under Secretary of Defense, AT&L. He will report directly to me on all Missile Defense Support Group matters. A list of the MDSG principals and working group members can be found in my written statement.

Finally, MDA will manage these programs during the research and development phase only. They will be transitioned to the military departments for deployment, at which time the normal acquisition process will take effect.

The objectives of this reorganization of our ballistic missile defense efforts are to integrate programs, centralize their management, elevate the authority, responsibility, and flexibility of that management, and to provide a more streamlined oversight process. It will be characterized by extensive OSD oversight and congressional visibility. I contend that it will advance ballistic missile defense toward its intended role as one of the greatest peacekeeping technologies ever created.

Thank you, Mr. Chairman. I will be happy to answer questions of members of the subcommittee at the appropriate time.

[The prepared statement of Secretary Aldridge follows:]

PREPARED STATEMENT BY HON. E.C. "PETE" ALDRIDGE

Good morning, Mr. Chairman, members of the subcommittee. Thank you for the opportunity to appear before you today to discuss the fiscal year 2003 Department of Defense missile defense program and budget. It is my goal to address the new

management structure of the missile defense program and discuss the new, more flexible oversight process which is being adopted by the Department.

On January 2, of this year, Secretary Rumsfeld issued his direction to the Department for the missile defense program. His stated objectives included the establishment of a single program to develop an integrated Ballistic Missile Defense System under the authority of a single organization, the Missile Defense Agency (MDA). He directed that a capability-based requirements process be adopted and that streamlined oversight be incorporated to facilitate the earliest possible deployment of missile defense capabilities to the Services.

Redesignation of the Ballistic Missile Defense Organization as the Missile Defense Agency provides greater authority to Lieutenant General Kadish and his staff to manage the rigorous technical challenges associated with developing missile defenses. The additional authorities are necessary due to the magnitude of the program, and the high priority placed on this effort by the President. It is for these same reasons that the Secretary directed the use of a streamlined oversight process. The Secretary has indicated his intention to look to the DOD Senior Executive Council (SEC) for oversight and recommendations for decision-making in this area. The SEC is chaired by Deputy Secretary Wolfowitz and includes the Service Secretaries and myself.

In that regard, I recently issued implementation guidance based on Secretary Rumsfeld's direction. In this guidance, I directed the Director of the MDA to plan and execute a single missile defense program, structured to integrate work and enable capability trades across different elements of the BMDS and to facilitate decisive action in response to program events. This single program has the same reporting requirements to OSD and Congress that all other programs have. The Director of the MDA has been given full authority to execute a capability-based acquisition approach that will produce missile defenses at the earliest feasible date. He will have the authority and responsibility to develop all associated technologies and conduct developmental testing. He will interface with the warfighter community to determine desired operational features and to develop strategies for introducing developed capabilities into the fighting forces. He will have the authority to manage the acquisition strategy, make program commitments, award contracts, make affordability tradeoffs, and exercise milestone decision authority up to, but not including, Milestone C (the beginning of the production and deployment phase).

The unique management and oversight processes described above apply only to the development phase, when the configurations of missile defense systems are still being defined and production and deployment considerations are unknown. At the point where an individual element of the BMDS progresses to the point of demonstrating useful capability, the Director of the MDA will recommend that the SEC consider it for transition to production and deployment. Transition to procurement will create an acquisition program in its own right and activate the management, oversight, and reporting processes used for traditional defense acquisition programs. I will establish the necessary product teams and processes needed to support a Milestone C production decision by the Defense Acquisition Board (DAB). Following the Milestone C decision, the designated Military Department will manage the program following standard acquisition processes and reporting.

To advise the Director of the MDA on management of the Ballistic Missile Defense program and to aid the SEC in executive decision-making on missile defense, I have formed a Missile Defense Support Group (MDSG) of designated senior experts from 13 selected staffs within the Department. The Chairman of the MDSG is the Director of Strategic and Tactical Systems. He will report directly to me on all MDSG matters. The MDSG consists of senior and experienced individuals who will be able to provide useful insights and recommendations on policy, operations, acquisition, and resource matters that affect the BMDS. Members of the MDSG will be supported by a Working Group of individuals from their support staffs. They will promote the success of the BMDS by providing informed constructive advice on the program and keeping their principals advised of program progress and developments. They will perform independent reviews and studies of the ballistic missile defense program where needed. A list of the MDSG principals and working group members is as follows:

MISSILE DEFENSE SUPPORT GROUP MEMBERSHIP

Organization	MDSG	MDSG (WG)
OUSD(AT&L)S&TS	Dr. Spiros Pallas	CAPT Michael Cregge
	Dr. Kent G. Stansberry	LTC(P) Stephen Kreider
Secretary of Army	BG(P) John Urias	COL Jeff Horne

MISSILE DEFENSE SUPPORT GROUP MEMBERSHIP—Continued

Organization	MDSG	MDSG (WG)
Secretary of Navy	Mr. David M. Altwegg	Ms. Denise Del Camp
Secretary of Air Force	MG(S) John Corley	COL Bo Reese COL(S) Rex Kiziah
USD(P)	Mr. David Trachtenberg	Dr. Peppi DeBiaso Dr. Rob Soofer
USD(C)	Mr. Ron Garant	Mr. Tom Kerr
VCJCS	Brig Gen Rick Lewis	Dr. Barry Fridling CAPT Roger Easton
ASD(C^3I)	Mr. John Landon	Mr. Jim Martin COL Brian Robinson
DOD(GC)	Mr. Doug Larsen	Ms. Shauna Russell Mr. Charles Bidwell
DOT&E	Mr. Larry Miller	Mr. Mario Lucchese CDR Barry Haynie
D, MDA	Dr. Glenn Lamartin	Mr. Robert Brown
D, (PA&E)	Dr. Michael Ioffredo	Dr. James Brooks Dr. Dennis Evans
C, (CAIG)	Dr. David McNicol	Dr. Richard Burke Mr. Steve Miller

The first task of the MDSG will be to review the MDA plan to implement Secretary Rumsfeld's January 2, 2002, missile defense program direction, and the implementation guidance issued by me. That plan will address matters of great importance to the success of the BMDS, including the program structure and funding allocations, the management structure, acquisition strategy, program documentation, and interfaces with the Services. The first combined MDSG and MDSG Working Group meeting occurred on Friday, March 8, to start the process of oversight and review. They will meet as required and will have access to the information they require to perform their responsibility.

The Department is making these changes in response to the high priority for missile defense articulated by President Bush. We believe that integrating several programs into one, centralizing their management within a single defense agency with greater authority, responsibility, and flexibility, and providing a more streamlined oversight process will cause missile defenses to be developed and deployed in a much more efficient manner than would be possible under the former structure. The SEC has already conducted six meetings to discuss the MDA, which is significantly more high-level oversight than other programs that normally only see this level of oversight at a DAB once every few years.

Congress will have the same visibility into the Ballistic Missile Defense System program that it has with other programs. In this context, some of the classical metrics of progress are affected by the adoption of an RDT&E-only approach to the development phase. To ensure that Congress has a full understanding of the program, we are committed to provide necessary details of how the program will be structured and managed.

The Department provided four information briefings to the defense authorization and appropriations committees staff, plus one to the House Government Reform Committee staff. During these first five briefings, which occurred shortly before the Secretary issued his direction on missile defense, we committed to provide details on how we planned to implement the Secretary's direction prior to issuing implementation guidance. On February 11 and 12, 2002, we provided four more briefings to each of the defense authorization and appropriations committees staff, presenting the implementation plans. The MDA has already conducted over 25 hours of briefings on the Ballistic Missile Defense System to members of the congressional staff. Those briefings provided specifics on the planned development activities for each element of the system this year. MDA will continue to provide Congress with detailed information to satisfy its oversight responsibilities. The annual Selected Acquisition Report (SAR) to Congress will be submitted on the BMDS with a separate SAR for the PAC–3 program, because procurement activity for PAC–3 has begun. Providing separate SARs will ensure full visibility into the transition of the program to the the Military Departments after a deployment decision, just as it will be done for the Army's PAC–3.

Thank you, Mr. Chairman. I would be happy to answer any questions you and the members of the subcommittee might have.

Senator REED. Thank you, Mr. Secretary. Mr. Christie, do you have a statement?

STATEMENT OF HON. THOMAS P. CHRISTIE, DIRECTOR, OPERATIONAL TEST AND EVALUATION, DEPARTMENT OF DEFENSE

Mr. CHRISTIE. Yes, I do, a very short one.

Good afternoon, Mr. Chairman and members of the subcommittee. I also thank you for the opportunity to appear before you and discuss our role, the role of the Office of the Director of Operational Test and Evaluation (DOT&E), in overseeing the planning and execution of a robust test and evaluation strategy for the various components that comprise our ballistic missile defense program.

As we have heard, the Missile Defense Agency is embarking on a new and aggressive approach to the development and acquisition of missile defense capabilities. The traditional paradigm of developing and producing weapon systems based on a set of user and technical system-level requirements is being transformed. This new approach is evolving to provide for the successful development of capabilities that are responsive to imminent threats and can be readily deployed while, at the same time, maintaining essential operational effectiveness and suitability standards for equipment that is fielded with our operational forces. As this MDA acquisition and oversight process evolves, DOT&E, my office, is adjusting the way we will execute our responsibilities to accommodate this new approach.

I use the word "evolving" in my references to this new process because I view that evolution as not yet complete. My staff and I have been given access to the MDA's initial plans, which are still in the early stages of implementation. My staff has been working with their MDA counterparts for some time now to assure that DOT&E will have access to MDA's plans and programs, and that that access will be adequate to accomplish our oversight mission. We have agreed at this point to an oversight approach where we are broadly involved at the MDA and element levels during the early research, development, test, and evaluation (RDT&E) phases.

Our level of involvement will increase appropriately as the programs mature and progress through to the transition and procurement phases. We plan to monitor significant testing and technology interchange activities at the project level throughout all the phases of these programs. We will provide the results of our evaluations directly to the MDA, General Kadish, and to the senior leadership of the Department through the Missile Defense Support Group and its Working Group, both of which, as Secretary Aldridge stated, include members of my staff.

As the programs move through the transition phase, we will increase our involvement in test planning and execution activities, especially as appropriate to support both live-fire test and evaluation and operational test and evaluation. We plan to provide an independent operational assessment that addresses the operational effectiveness and suitability for each capability at each of its major decision points.

DOT&E will also prepare an annual report for the Department and for Congress on each of the MDA programs. As required by

congressional language, this report will provide our assessment of the adequacy and sufficiency of MDA's testing program over the previous year.

In addition to missile defense program redirection, MDA is redefining the ballistic missile defense architecture to provide a system-of-systems approach to a layered missile defense. The new approach integrates the old national and theater ballistic missile defense initiatives into an integrated layered approach now called the missile defense system. We will closely monitor testing of the individual elements within the missile defense system, as well as the testing of the integrated elements, including the battle management, command, control, communications, and intelligence (BMC^3I), which will tie all the individual elements together to provide a robust, integrated, layered missile defense system capability.

A key aspect of the development and testing of the new missile defense system is establishing the missile defense system testbed and its supporting infrastructure. This integration of both existing and new facilities and equipment is planned to support the execution of more operationally realistic ground and flight testing. The testbed, as we know it, should mitigate many of the existing test limitations that have prevented operationally realistic flight testing of the old national missile defense system. As a result of phasing in new launch and tracking facilities, future ground-based mid-course system flight testing can gradually increase in realism and complexity at a pace consistent with disciplined engineering practice and fiscal responsibility. I strongly concur with the funding and development of this vital testing asset.

I intend to work very closely with both Under Secretary Aldridge and General Kadish to support the development and adequate testing of a capability that will secure the defense of our Nation and its fighting forces while, at the same time, maintaining our responsibility for acquisition oversight.

Mr. Chairman and Senators, I would be pleased to answer any questions that you have.

[The prepared statement of Mr. Christie follows:]

PREPARED STATEMENT BY HON. THOMAS P. CHRISTIE

Good afternoon, Mr. Chairman, members of the subcommittee. I thank you for the opportunity to appear before you to discuss the role of the office of the Director of Operational Testing and Evaluation (DOT&E) in overseeing the planning and execution of a robust test and evaluation strategy for the various components that comprise our ballistic missile defense (BMD) program.

The Missile Defense Agency (MDA) is embarking on a new and aggressive approach to the development and acquisition of missile defense capabilities. The traditional paradigm of developing and producing weapon systems based on a set of user and technical system-level requirements is being transformed. The new approach is evolving to provide for the successful development of capabilities that are responsive to imminent threats and can be readily deployed, while at the same time maintaining essential operational effectiveness and suitability standards for equipment that is fielded with our operational forces. As this MDA acquisition and oversight process evolves, DOT&E is adjusting the way we execute our responsibilities to accommodate this new acquisition approach.

I use the word "evolving" in my references to this new process because I view that evolution as not yet complete. My staff and I have been given access to the MDA's initial plans, which are still in the early stages of implementation. My staff has been working with their MDA counterparts to assure that DOT&E access to MDA's plans and programs is adequate for us to accomplish our oversight mission. We have

agreed to an oversight approach where we are broadly involved at the MDA and element levels during the early RDT&E phases.

Our level of involvement will increase appropriately as the programs mature and progress into and through the transition and procurement phases. We plan to monitor significant testing and technology interchange activities at the project level throughout all the phases. We will provide the results of our evaluations directly to the MDA and to the senior leadership of the Department through the Missile Defense Support Group (MDSG) and its Working Group, both of which include members of my staff. As the programs move through the transition phase, we will increase our involvement in test planning and execution activities, especially as appropriate to support both live fire test and evaluation and operational test and evaluation. We plan to provide an independent operational assessment that addresses the operational effectiveness and suitability for each capability at each of its major decision points. DOT&E will also prepare an annual report for the Department and Congress on each of the MDA programs. As required by congressional language, this report will provide our assessment of the "adequacy and sufficiency" of MDA's testing program over the previous year.

In addition to missile defense program redirection, MDA is redefining the ballistic missile defense architecture to provide a system-of-systems approach to a layered missile defense. The new approach replaces the old national and theater ballistic missile defense initiatives with an integrated, layered approach, now called the missile defense system. We will closely monitor testing of the individual elements within the missile defense system, as well as the testing of the integrated elements, including the battle management, command, control, communications, and intelligence (BMC^3I), which will tie the individual elements together to provide a robust, integrated, layered missile defense system capability.

A key aspect of the development and testing of the new missile defense system is establishing the missile defense system testbed and its supporting infrastructure. This integration of both existing and new facilities and equipment is planned to support the execution of operationally realistic ground and flight-testing. The test bed should mitigate many of the existing test limitations that prevented operationally realistic flight-testing of the old national missile defense system. As a result of phasing in new launch and tracking facilities, future Ground-based Midcourse System flight-testing can gradually increase in realism and complexity at a pace consistent with disciplined engineering practice and fiscal responsibility. I strongly concur with the funding and development of this vital testing asset.

I intend to work very closely with both Under Secretary Aldridge and General Kadish to support the development and adequate testing of a capability that will secure the defense of our Nation and its fighting forces, while maintaining our responsibility for acquisition oversight.

Mr. Chairman, I would be pleased to answer any questions you may have.

Senator REED. Thank you very much, Mr. Christie.

General Kadish.

General KADISH. I have submitted a statement, I would like it included in the record, and I have some opening remarks.

Senator REED. General Kadish, you are recognized.

STATEMENT OF LT. GEN. RONALD T. KADISH, USAF, DIRECTOR, MISSILE DEFENSE AGENCY

General KADISH. Good afternoon, Mr. Chairman and members of the subcommittee.

We have modified our approach to the acquisition of missile defenses to reflect the reality of change and surprise in our world today. September 11 brought home this reality very forcefully to all of us in the Missile Defense Agency. The Department has restructured the missile defense program as a national priority with focused management attention so that we can reduce our decision cycle time during development to handle a very complex set of challenges.

I believe we can meet those challenges if we do two things. First, make sure our technologies are mature enough to begin develop-

ment and testing, and second, take an evolutionary or phased approach to development, production, and deployment.

To support this approach, on January 2, of this year, as Secretary Aldridge alluded to, the Secretary of Defense redesignated the Ballistic Missile Defense Organization as the Missile Defense Agency and changed the responsibilities and authorities of the Director. While some of these authorities given to the Director are new, all of them are within the Secretary's existing statutory powers. Moreover, our activities will be just as apparent, I believe, and our accountability to you and the American people just as assured as they have been in the past.

The Secretary has set up a formal oversight process for the missile defense program, as described by Secretary Aldridge. As Director, I will continue to report to the Under Secretary, and the SEC, chaired by the Deputy Secretary, which will provide executive oversight of the program. The SEC provides guidance regarding policy, planning, and programming, and makes decisions on whether to stop, start, slow, or accelerate activities, and approves recommendations on the fielding of system elements. SEC members demand high standards of accountability, as was made clear with the Department's decisions to cancel the Navy area program and restructure the space-based infrared radar system (SBIRS)-Low program. I have briefed the SEC six times since last August on the status of our plans.

There is also a standing Missile Defense Support Group, as described by Secretary Aldridge. Its chairman reports directly to the Under Secretary, and all members are senior and experienced in missile defense.

In my view, there are two major reasons for these changes. The first is to provide more focused executive oversight and reduce decision cycle time throughout the development process. Program reviews in the traditional world of acquisition are episodic and subject to individual program events or milestones, which may be separated by months and years. Our new procedures provide for more frequent and comprehensive departmental oversight and will allow us to better respond to changing conditions and emerging events throughout the program.

The second reason we have changed our processes is that the existing departmental procedures were designed for a single service acquisition. When we are dealing with very complex programs, such as the F–22, the DDG–21, or the Comanche attack helicopter, ultimately we are looking at one service to operate and deploy the system.

Missile defense is very different. We have three military departments, the Joint Staff, and the regional commanders in chief all deeply involved. System integration requires that we cross Service boundaries at the outset of development, as well as many technical boundaries. Even at the mission execution level, no one Service will operate this system as a total system. The Missile Defense Agency, I believe, was established to pull these strands together and make an effective system.

Now let me turn to the subject of congressional oversight very briefly. We will continue to provide Congress annual budget justification materials supporting the President's budget submission.

Detailed budget and schedule summaries for all major budget projects within the system will be part of this submission, and will include our extensive engineering and rigorous testing activities as well as infrastructure plans for such development activities as THAAD and the Ground-based Midcourse system.

In addition to the annual schedule of program hearings, we have provided extensive briefings and numerous briefing opportunities. So far, during January and February of this year alone, we have concluded 25 hours of briefings to congressional professional and personal staffs, and these briefings will continue as you desire.

In order to deal with threat uncertainty, we are looking at a broader range of capabilities an adversary might have in a given time frame, and then developing defensive capabilities incrementally and in blocks. In simple terms, capability-based development means looking at the threats we face and building and deploying what we can in the shortest possible time. We accept that the capability we put in the field initially will be imperfect, but we can advance it and enhance it over time.

This requires that the user and the developer work closely together in a disciplined way throughout the developmental process. It requires rigorous testing to see what works best and to see what might help improve the deployed system. In short, it allows requirements to be flexible by putting the user and the developer on the same page in understanding how to develop a product like missile defense using unprecedented and very complex technology. This is the best way I can think of to build a complex missile defense system.

This approach is not really new. Our Nation has used it successfully in the past to develop the Polaris submarine-launched ballistic missile and the SR–71 reconnaissance aircraft. We are certainly familiar with upgrading systems over time. The B–52s that flew over Afghanistan last fall were far different aircraft than those that first rolled off the production lines 5 decades ago.

The authorities that the Secretary has given me are important to our success in my opinion. Reporting on the missile defense program will continue, and we will continue to pass to Congress and this subcommittee the information it needs to do its job.

Clearly, our ability to react rapidly to the swift-moving international security environment, while at the same time reforming how we do business within the Department, is a central challenge for us all. This committee's support for the President's Freedom to Manage Initiative will reduce statutory requirements that restrict management flexibility, allowing us to more effectively and efficiently execute the missile defense program with which we have been entrusted.

At the end of the day, however, it is very important that whatever we deliver actually improves our security. With your support, I am committed to making sure that happens, Mr. Chairman.

That concludes my statement.

[The prepared statement of Lieutenant General Kadish follows:]

PREPARED STATEMENT BY LT. GEN. RONALD T. KADISH, USAF

Good afternoon, Mr. Chairman, members of the subcommittee. It is a pleasure to appear before you today to testify on the recent establishment of the Missile Defense

Agency and reorganization of the missile defense program. I welcome this opportunity to describe our reorganization.

On January 2, of this year, the Secretary of Defense redesignated the Ballistic Missile Defense Organization as the Missile Defense Agency and changed the responsibilities and authorities of the Director. Your staff is familiar with the Secretary's directive.

The Secretary gave the Agency—and me as Director—new priorities and direction, and expanded responsibilities and authority to execute the missile defense program. Some of these new authorities differ from traditional departmental processes, but all of them are within the Secretary's existing statutory powers. Our activities will be just as apparent, and our accountability to you and the American people just as assured, as they have been in the past. We are developing a detailed plan by April to implement the Secretary's guidance. We believe that the changes we are instituting will provide for a better structure to manage and execute the missile defense program and will enhance our performance as responsible stewards of the resources entrusted to us.

PROGRAM DIRECTION

The Secretary spelled out four top priorities for missile defense. They are:

- First, to defend the United States against limited missile attack, as well as to defend U.S. deployed forces, allies, and friends;
- Second, to employ a Ballistic Missile Defense (BMD) System that layers defenses to intercept missiles in all phases of their flight against all ranges of threat;
- Third, to enable the Services to field elements of the overall BMD System as soon as practicable; and
- Fourth, to develop and test technologies, to use prototypes, and to test assets to provide early capability, if necessary, and to improve the effectiveness of deployed capability by inserting new technologies as they become available or when the threat warrants an accelerated capability.

The Secretary also provided specific objectives for the program to:

- Establish a single program to develop an integrated system under a newly titled Missile Defense Agency (MDA);
- Assign the best and brightest people to this work;
- Apply a capability-based requirements process for missile defense; and
- Direct the MDA to develop the missile defense system and baseline the capability and configuration of its elements and the Military Departments to procure and provide for operation and support.

THE BALLISTIC MISSILE DEFENSE SYSTEM

We are developing a single integrated BMD System to counter all ranges of ballistic missiles.

Let me clarify some of the terms we use. When we speak of one BMD System, we refer to the operational integration of all missile defense elements, including sensors, weapons, and battle management/command and control capabilities, regardless of which Service operates them. We speak in terms of three defense segments that categorize the capabilities to intercept a hostile missile during each phase of its flight: a Terminal Defense Segment, a Midcourse Defense Segment, and a Boost Defense Segment. We group sensors under a fourth segment.

Some of the terminology has changed. For example, the Ground-based Midcourse Defense, or GMD, replaces the former National Missile Defense designation as a better descriptor of what it is—a capability to destroy missiles in the midcourse phase of flight using a ground-based interceptor.

Each defense segment is made up of elements, which correspond roughly to the old Major Defense Acquisition Programs (MDAPs). Within the Midcourse Defense Segment, for example, GMD is an element, and within the Terminal Defense Segment, THAAD is an element. Below the element level, we have components—THAAD is an element, while its radar, for example, is a component.

In programmatic terms, we no longer speak of national or theater missile defense. Operationally, the terms can take on different meanings depending on where you live. The distinction between them made sense a decade ago, when we faced the stark difference between a Soviet ICBM threat and an Iraqi Scud. Now it no longer does. The same North Korean missile aimed at Japan could be a national threat to our ally, but a theater threat to us—unless it were retargeted toward the United States, in which case it would become national again. Furthermore, at some point

in time, a short-range missile could threaten our homeland just as well as an ICBM could, if, say, it were launched from the sea off our coast.

Especially after September 11, from my point of view, we want to make sure that we are effective against all ranges of threats. It is a national decision as to where and when we deploy our capabilities. We face the complex task of integrating many elements, because the flight physics of the variety of missile speeds, trajectories, and the environments through which missiles travel preclude our having one defensive technology that can do it all.

DEPARTMENTAL OVERSIGHT

The Secretary has set up a formal oversight process for the missile defense program. As Director, I continue to report directly to the Under Secretary of Defense (Acquisition, Technology, and Logistics). The Senior Executive Council, or SEC, chaired by the Deputy Secretary, provides executive oversight of the program. Permanent members are the Service Secretaries and the Under Secretary (AT&L). Other Department officials will be included as needed, depending on the subject at hand.

This Council conducts periodic formal and informal reviews of the program. I have already met with the SEC six times since last summer, including several to provide formal briefings of our status and plans. Planned reviews include such topics as program plans, management approaches, test performance, system architecture, technological alternatives, basing options, and the threat. The SEC provides guidance regarding policy, planning, and programming; makes the decisions as to whether to stop, start, slow, or accelerate efforts; and approves recommendations on fielding elements of the system. This group demands high standards of accountability. You have seen some of this recently regarding Department decisions to cancel the Navy area program and restructure SBIRS-Low.

Additionally, the Department has created a new, standing Missile Defense Support Group, the Chairman of which reports directly to the Under Secretary. This Support Group provides advice both to the Under Secretary and to me, as well as input to the SEC. It performs independent assessments, and is supported in turn by a working group. The members of the Support Group are all senior and all experienced in missile defense.

Why these changes? There are two major reasons. The first is to provide more direct and focused executive oversight and reporting. We need to reduce decision-making cycle time, and we are looking for real-time involvement. If we went through the normal departmental processes, the reviews would be episodic, subject to individual program events or milestones, and there could be years between these events. Our new procedures provide for more frequent and more comprehensive oversight of the missile defense program than we currently have and can better respond to changing conditions and emerging events. They provide for more internal accountability at a more rapid pace than we have had in the past.

The second reason we have changed our processes is that existing departmental procedures were designed to satisfy the needs of single Service acquisition. Even when the Department deals with very complex programs, such as the F–22, the DDG–21, or the Comanche attack helicopter, ultimately we are looking at one Service to operate the deployed system. Our acquisition procedures have been designed over time to provide oversight for that one Service. Very seldom have Service boundaries been crossed.

Missile defense is different. In missile defense, we have three Military Departments, the Joint Staff, and the warfighting commanders in chief, all deeply involved in providing the kind of layered defenses we need. Service boundaries are crossed from the start to provide for integration within the BMD System. Even at the operational level, no one Service will operate missile defenses. That is why the Missile Defense Agency was created in the first place, to pull all these strands together, regardless of whether the basing mode of any single element was on the ground, at sea, in the air, or in space. Oversight for the missile defense program under these circumstances requires a new approach. I can assure you the work on this approach has already been rigorous.

Let me describe some other features of the restructured program and processes, and then I will come back to the important issue of congressional oversight.

CAPABILITY-BASED ACQUISITION

There appears to be confusion about what capability-based acquisition is. Some have interpreted this as doing away with requirements. That is not the case. We are not doing away with requirements. We are, however, changing how we derive, define, and deal with them.

Instead of developing systems to respond to a narrowly defined threat from a known adversary, we find we cannot know with confidence what specific adversary might pose what specific missile threat and when. Hence, as a starting point, we are looking at the broader range of capabilities an adversary might have in a given time frame and then developing defensive capabilities based on technological maturity in blocks that will evolve over time.

The traditional development process started with specific military requirements generated by the user and became formalized in the Operational Requirements Document, or ORD. This traditional ORD approach has generally served us well, especially in procurements involving well-known technologies, proven systems, sizeable production runs, and established operational experience. None of these yet exist in missile defense.

For us, the strengths of the traditional requirements generation process can also be its weaknesses. It is rigorous, but that very rigor translates into a lack of the flexibility needed to deal with unprecedented technology development. Requirements defined in ORDs are typically set many years before actual system deployment, and can often lead to less than optimum capability against a threat that exceeds the description specified earlier.

Furthermore, at the moment, we do not yet know all the technical approaches that will work best. Five years ago, we could not have foreseen, let alone written down, all the uses that define today's Internet. It would not be prudent to lock in our development path now and find out some years down the road that we have weakness in the system. This could come about because of an unexpected technical obstacle, because of some new development in the threat, or because we failed to exploit some practical technical innovation that we might otherwise have captured with our incremental acquisition approach.

Yet we always face the risk of being surprised by changes in the threat. Missile defense has perhaps more uncertainties in this regard than many other mission areas. We do not want to alter our baseline every time we recognize a change in the threat. Such changes could ripple through the program and likely cause significant delay and cost. So instead of a point threat, we are setting a wider range of boundaries for adversarial capabilities over time in defining our own needed capabilities. The baseline we set must be able to deal with surprises and changes in the threat. A capability-based approach allows us to adjust to those changes in ways that the traditional requirement-based approach does not.

These capability definitions act as formal requirements, with one key difference—they can be changed as necessary during the developmental stages to reflect changes in the threat or to take advantage of technical or engineering breakthroughs. Since they evolve in parallel with capabilities, they allow us to reduce cycle time, schedule risk, and cost risk.

While we are moving away from some of the rigidities of the past, we are not abandoning rigor in development. In my opinion, far from it. A capability-based approach provides for significant discipline. It is just guided by different mileposts. Instead of the traditional process where users define the requirement in great detail, then, subsequently, developers translate the requirements into specifications, we intend to do both at the same time. In so doing, we can accrue the same advantages that the commercial world enjoys.

We are bringing together users and developers under our Agency's lead—the warfighters, the Services, and industry. Together, all of them will have a continuous and constructive role in establishing the mission requirements for missile defenses, unlike that under the older process. The warfighters will not disengage after setting the requirements at the outset, and industry will not be brought in at the last moment—they will both be present from the start. This partnership will be continuous and remain vital throughout the whole development process. This focused, unbroken interaction will allow us to make more timely capability trades, explore a broader range of options, and upgrade our capabilities to keep them current.

The developmental goals drawn up by this interaction are periodically reassessed until a decision is made to capture them and fix the characteristics of each 2-year block increment of capability. That is our plan—to be able to field, when directed, an effective capability, proven through rigorous testing, in 2-year blocks and to upgrade it incrementally and continually as the need arises. This aspect is called evolutionary acquisition.

In sum, capability-based acquisition is a flexible approach to the acquisition of complex systems, incorporating advanced technologies, that permits the early deployment of a limited but effective capability that can be progressively enhanced over time as needed. It provides for continuous warfighter involvement and disciplined development aimed at reducing cycle time. It stays relevant to the threat

and remains technologically current. That is our vision for the capability-based approach and also how we intend to execute it.

This approach is not really new. Our Nation has used it successfully in undertaking previously unprecedented technological endeavors. Among other programs, we used this approach for making the trade-offs and accelerating the schedule to develop the Polaris submarine-launched ballistic missile and the SR–71 reconnaissance aircraft. We are certainly familiar with upgrading systems over time. The B–52s that flew over Afghanistan last fall were far different aircraft than those that first rolled off the production lines five decades ago.

PROGRAM MANAGEMENT

As we changed our approach to development, we found we also had to change our approach to management. The program is moving from being element-centric to system-centric, and the transitions during the acquisition cycle are more complex, especially in the hand-off from development to production. Our program has entered a new phase, having moved from technology development to systems engineering and the very significant challenge of integrating many diverse elements, including battle management, into one BMD System. This management challenge is at least equal to our technical ones, and it is no less urgent.

This challenge of systems engineering is unprecedented because not only do we have thousands of individuals involved in hundreds of efforts at dozens of locations, but we also are dealing with cutting-edge technologies at varying levels of maturity, involving all Services and their doctrines, investigating four different basing modes, and making it all work together. The systems engineering task for the BMD System involves, among other aspects, developing interface requirements, element design requirements, verification methodologies, and assessments needed for recommendations on system progress.

Our revised approach to acquisition now specifies three broad phases: Development, Transition, and Procurement. As Director of the MDA, I have oversight and responsibility for managing the first two phases, Development and Transition. The SEC, upon my recommendation, approves progression between the two.

During the Transition phase, the Services take on increasing responsibilities, as elements move closer to production and possible deployment. At the start of the third phase, Procurement, the Services pick up responsibility for managing the production, fielding, training, and support of the elements of the BMD System and their components. Budgeting during this phase is divided. The MDA will budget for RDT&E funds, and the Services will budget for procurement, operation, and support funds.

Managing the transition between the Development and Procurement phases will be complex, but it can be done efficiently and effectively. While MDA retains system oversight, responsibility for each element is shared by MDA and the Service that will operate it once deployed. We will baseline the capabilities and configurations during transition, and the Services will develop capability-based ORDs around performance that, by this stage in development, has been characterized for a particular element. These ORDs will become effective on transfer of the element to the gaining Service.

MDA has overall responsibility for designing and maintaining the integrated Missile Defense System. For this reason, MDA retains responsibility for those element specifications that contribute to ensuring full element integration into the initial system block and in all subsequent blocks.

When ready, I will make recommendations for the procurement of elements or their components. Only the SEC can approve the move to production, and the associated budget and force structure objectives.

This decision point is not exactly equivalent to any milestone in the traditional acquisition framework, but is tailored to be a decision to transfer to a Service the responsibility for producing a particular configuration of an element and operating it in a quantity appropriate to the maturity of the system and its military utility. Should the SEC approve the move, elements entering the procurement phase would fall under the formal purview of the Joint Requirements Oversight Council, or JROC, and traditional oversight and reporting mechanisms come into play. As is the case now, the Under Secretary (AT&L) will continue to oversee Service procurement activity.

CONGRESSIONAL OVERSIGHT

Let me turn to the subject of congressional oversight. In the near term, changes to the missile defense structure will lead to changes in the information Congress had previously seen, since the former Major Defense Acquisition Programs (MDAPs)

are now elements within the overall BMD System. For example, prior reports included details for the PAC–3, THAAD, NMD, Navy Area, ABL, and SBIRS-Low. These now lie within the overall missile defense program. Additionally, these former reports also included RDT&E, military construction, and procurement information. Yet since the missile defense program is now primarily an RDT&E program, unit cost information will be available only after production decisions have been made. Thus while we have unit costs for PAC–3 this year, the unit costs for other elements will come later.

That underscores the difficulty of estimating system or even element costs at this time. RDT&E costs are expected to continue, although future levels may vary depending on which elements and components are chosen for full development. This parallels our RDT&E experience in other systems as well, as we move to upgrade the right capabilities in response to changes in the threat and technology. Similarly, procurement costs and life cycle costs cannot be estimated with precision at this time, because force structure decisions on the elements or the components eventually chosen have not been made.

Nonetheless, we will submit to Congress a Selected Acquisition Report (SAR) for the BMD System RDT&E program, to include major program schedule objectives and an estimate of the BMD System and RDT&E program funding. Without procurement, the report cannot address production unit costs, but it will, however, include major prime contractor cost performance data. Congress will receive unit costs to support planned procurement once the SEC decides to start that procurement.

Additionally, we will be supplying—as we have this year—Congress with annual detailed budget justification materials supporting the President's budget submission. For example, this year's R–2 budget document describing the details of our request is over 400 pages long. The information is consistent with the BMD System work breakdown structure, legislated program elements, and special interest items. Included are detailed budget and schedule summaries for all major budget projects within the system, such as the extensive engineering and rigorous testing infrastructure and activities needed for THAAD and Ground-based Midcourse Defense development.

Furthermore, in addition to the annual schedule of program hearings, we have provided extensive briefings—and briefing opportunities—to both Members of Congress and congressional staff members. So far, during January and February of this year alone, we have had over 25 hours of briefings on the program to personal and professional staff. These briefings will continue as needed.

OPERATIONAL TESTING

During the development phase, MDA will be responsible for conducting developmental testing with the purpose of characterizing the capability and military utility of the technologies and their integration, and for making recommendations for transition. As Director of the Ballistic Missile Defense Organization, I was responsible for that. As Director of the Missile Defense Agency, I remain so. That has not changed. Moreover, the Director, Operational Test and Evaluation, is represented on the Missile Defense Support Group and as such will be in a position to advise the Under Secretary and me throughout the development and transition phases.

During the transition phase, an operational test agent will be designated and focused operational testing will be conducted to characterize the operational effectiveness and suitability of the element block configuration under consideration. This operational testing will be conducted under the oversight of the Director, Operational Test and Evaluation and in accordance with a Test and Evaluation Master Plan (TEMP) that he and I will jointly approve. Based on the results of that operational testing and other inputs, the SEC will decide whether to transfer the tested configuration of the element to the Service for procurement and operation. All statutory requirements relative to operational testing will be met. Our fiscal year 2003 budget, presented separately, details our plan to expand the BMD System test bed, useful for both developmental and operational testing.

RELATIONSHIP WITH INDUSTRY

A final important facet of our restructured program is how we will work with our industry partners to develop capability.

In many ways, our relationship with industry is even more complex than with the Services. To help us find the right solution, we looked at how other unprecedented programs had been managed in their day, and these included such diverse and pioneering efforts as the Manhattan Project, the Mercury, Apollo and ICBM program, and the experience with the Space Shuttle. In each case, government maintained total program responsibility, but what became clear was that the government, too

often, did not have a detailed enough understanding of either exactly what to buy or what industry could offer. The solution lay in forging a much closer relationship between government and industry than normal practice entails.

This is the approach we are taking: to bring together as a national team the best and the brightest from the government, academia, and industry, so as to ensure timely and effective development of missile defense capability. This management approach will provide significant value to the missile defense program in bringing the best talent, the essential capabilities, the right process methodologies, and all of the pertinent proprietary information to bear on our solutions. It will provide a strong, disciplined approach with incentives for high performance and quality output.

To recap, government has total system responsibility. Industry teams are responsible and accountable for block capability design, BMD System integration, and the tough challenge of ensuring effective and positive battle management, command and control. In addition to the standard mechanisms of traditional program oversight, I intend to meet regularly with the CEOs of the relevant firms. I have already met with them, both singly and together as a group. They are on board.

CLOSING

Mr. Chairman, we have modified our approach to the acquisition of missile defenses because of the changes in our world. September 11 brought home the lesson forcefully. As Secretary Rumsfeld said, "We're at a moment where we no longer have the margin for error [that we] . . . had decades ago where our weapons were relatively short range and where the warheads were relatively modest.[1]" We can expect to be surprised again, and the consequences could be grave.

The Department has restructured the missile defense program so that we can reduce our decision cycle time during development to handle a very complex set of challenges and to react better and faster to changes in the threat. The authorities granted to me as Director are limited by checks and balances. They are monitored by a responsive oversight process that will ensure accountability and visibility for missile defense development both to the administration and to Congress.

Clearly, our ability to react rapidly to the swift-moving international security environment, while at the same time reforming how we do business within the Department, is a central challenge for all of us. This committee's support for the President's Freedom to Manage Initiative will reduce statutory requirements that can restrict management flexibility, allowing us to more efficiently and effectively execute the missile defense program with which we have been entrusted.

What is important is that, at the end of the day and with your support, what we in the Missile Defense Agency deliver must be of use to the warfighter and must improve our Nation's security. I am committed to making sure that happens.

Mr. Chairman, that concludes my statement. I welcome your and the subcommittee's questions.

Senator REED. Thank you very much. Your statements will all be included in the record.

Let me also state that we are extremely fortunate to have gentlemen like yourselves with experience and the dedication that you bring to this endeavor. So, thank you.

Now let me recognize Senator Allard for any comments he might have.

Senator ALLARD. Mr. Chairman, I have some comments I would submit for the record. I would like to get moving ahead with the hearing. I ask unanimous consent that my remarks be made a part of the record.

Senator REED. Without objection.

[The prepared statement of Senator Allard follows:]

PREPARED STATEMENT BY SENATOR WAYNE ALLARD

Thank you, Mr. Chairman. I want to welcome our witnesses today. Secretary Aldridge, General Kadish, it's good to see you again, and Mr. Christie, it's a pleasure to have you here today.

The Department of Defense is embracing capabilities-based, spiral development as a means of putting militarily useful capability into the hands of the warfighter fast-

[1] Interview with [Britain's] *The Daily Telegraph,* February 25, 2002.

er than we have in the past. This is an approach based on commercial and public sector best practices, and consistent with recommendations in General Accounting Office (GAO) studies solicited by this committee.

The Missile Defense Agency appears to me to be at the leading edge of these broader changes within the Department of Defense. This past year was a challenging one in many ways for the missile defense community. General Kadish, you had the extraordinarily difficult task of trying to manage very demanding programs, even as those programs were being reoriented in a series of wrenching policy, organizational, and management shifts. The Ballistic Missile Defense Organization was transformed into the Missile Defense Agency. You changed the whole approach of your BMD program, from one built around stove-piped elements to a single integrated BMD System to provide layered defenses against missiles of all ranges. You have established a national team to provide the expertise and insight to help integrate all the elements of this system. You have had to adapt your management processes as directed by Secretary Aldridge. You've had to alter program content to reflect an acquisition approach that emphasizes technical maturity and proven capability prior to deployment. That is a daunting agenda for 1 year, but one I think you handled well.

Successful acquisition and technology development organizations, as documented by GAO, separate technology development from product development and mature technology by using integrated engineering prototypes before proceeding with production decisions. Many of these approaches are being adopted by DOD. In practice, the spiral technology development approach should allow for technology to mature under the Missile Defense Agency to the point that it can be incorporated into a program run by the Services without many of the problems associated with past acquisition programs.

Will this approach be successful? No one can say. Acquisition reform is always difficult. It will depend on good management discipline at DOD. DOD's unreformed requirements and budget processes will also challenge this new acquisition approach. I expect our witnesses will have something to say about how the MDA will define BMD requirements and how that will differ from the process as it applies to other programs. In addition, the appropriate level of developmental testing necessary to mature technology, as well as the level of operational testing for each production spiral still needs to be worked through. While the information I have seen to date leads me to believe that the operational test and evaluation community will get visibility and input into MDA programs, I look forward to our witnesses shedding some light on how they anticipate this approach will work.

I know some critics may simply have a fundamental disagreement with the direction of the entire Department of Defense acquisition reform movement. Yet unless someone proposes a better alternative than this new approach, we all may find ourselves in the awkward position of having to live with the old Pentagon acquisition system, a system that led to concurrent development of systems and technology, high technical risk, schedule delays, cost increases, and weapons system cycle times measured in decades—a system that for years this committee has sought to improve. Personally, I don't believe that such a result would be desirable.

Mr. Chairman, I thank you again for your patience today. I look forward to working with you in the future in what I hope will be common cause to improve the defense acquisition system and assure that effective missile defenses are deployed as soon as practicable. I look forward to the testimony of our witnesses.

Senator REED. I presume there is no other member who wants to make an opening statement.

Senator SMITH. I have one for the record, Mr. Chairman.

Senator REED. Without objection, it will be included in the record.

[The prepared statement of Senator Smith follows:]

PREPARED STATEMENT BY SENATOR BOB SMITH

Thank you, Mr. Chairman, and thank you gentlemen, for taking time out of your busy schedules to appear in front of this subcommittee. I have long been a staunch and vocal proponent of missile defense. I want to congratulate the administration for its total "reinvention" of the missile defense program. I think it is exactly the right thing to do to view ballistic missile defense from a single, integrated, layered approach, and the elevation and renaming of the Ballistic Missile Defense Organization to the Missile Defense Agency is a positive step.

I believe this approach best enables the MDA to drive toward its priorities of defending the United States homeland, our deployed forces, allies, and friends; providing layered defenses in the boost, midcourse, and terminal phases of flight against all ranges of threats; enabling the Services to field elements of the system as soon as practicable; and to develop and deploy prototypes should the threat warrant.

I applaud the progress that has been made. I also applaud the innovative acquisition and programmatic review structure that has been defined to assist this program through its development. I believe the evolutionary spiral development process acknowledges that early in the development phase it is impossible to define the end state of an operational system, to be developed and fielded in an incremental fashion which allows "small steps" to be taken first and lessons drawn from them before requiring the system to "run."

Mr. Chairman, far too often the Services, with the best interests in mind, develop Operational Requirements Documents much too early in development and then spend money trying to drive to those requirements with blinders on before seeing that the development path should be driving towards alternative requirements.

This has been especially the case in space programs. The evolutionary spiral development process will enable a prudent, thoughtful approach to instituting increased requirements in the program versus the traditional "requirements creep." I believe the programmmatic and acquisition review structure you have instituted is very well thought out and is the right structure for an ambitious missile defense program. There have been criticisms levied against the program that somehow the program will have less oversight and will be in the hands of a small group that will run rampant. Those arguments are unfounded.

The review and oversight of the missile defense program, in fact, will be far more robust than that on traditional programs. The program will be reviewed by the DOD's Senior Executive Council at least annually, where other programs are reviewed only at major milestones or events. Both the Missile Defense Support and the Working Group, consisting of membership form the Services, the Joint Chiefs of Staff, operational test and evaluation, and other offices that normally are represented on Defense Acquisition Boards, will review the program at far greater intervals than normal programs. Congress will also be affored many opportunities to review the program.

Again, I applaud you gentlemen, and the administration, for showing the courage to revamp the missile defense program into one that has the highest probability for success. I look forward to working closely with you to help make it happen.

Senator REED. We will conduct 6-minute rounds of questions. Let me begin, and we will take as many rounds as necessary to answer all of our questions.

Gentlemen, section 232 of the National Defense Authorization Act for Fiscal Year 2002 states the following: "Officials and elements of the Department of Defense specified shall, on an ongoing basis, review the development of missile defense goals and the annual missile defense program plan and provide to the Secretary of Defense and the Director of the Ballistic Missile Defense Organization, now the Missile Defense Agency, any comments on such matters as considered appropriate."

Included among that group of designated agencies is your agency, Mr. Christie. Did you have an opportunity, prior to the submission of the program plan and defense goals to Congress, to provide any comments on the development of the goals and program plan in accordance with section 232?

Mr. CHRISTIE. To be brutally frank, I did not have that opportunity this year. I will have that opportunity in the future. I think the plans were put together toward the end of the year, and I had made arrangements with General Kadish to begin our process of oversight and interaction with his staff once the process of restructuring the MDA programs and organization was completed. Unfortunately, we did not have the opportunity to look at the budget preparation before it was submitted to the Hill.

Senator REED. Thank you, Mr. Christie.

General Kadish, did you provide your goals and program plan to all of the organizations, stipulated in section 232, prior to submitting them to Congress?

General KADISH. We made the normal budget submission through the departmental process. I would have to go back and check to make sure of all the areas in that section. I am not familiar with them at this point. But we went through the normal process within the Department in a very expedited manner because of the time lines we were facing.

Senator REED. Could you, for the record, indicate whether or not you provided those goals and plans?

General KADISH. I would be happy to, Senator.

Senator REED. Thank you, General.

[The information referred to follows:]

The National Defense Authorization Act for Fiscal Year 2002 was signed into law on December 28, 2001. By that date, the Missile Defense Agency's fiscal year 2003 budget estimate had already been prepared by the agency and forwarded through Department of Defense channels to the Office of Management and Budget. Consistent with Department processes in effect prior to the Fiscal Year 2002 Defense Authorization Act, the budget estimate and the accompanying goals and program plan were reviewed by the Under Secretary of Defense for Acquisition, Technology, and Logistics and the Director of Program Analysis and Evaluation, but not by the other three offices identified in Section 232(e).

Processes for the fiscal year 2004 budget estimate will include the five offices identified in Section 232(e). In addition, all are members of the Missile Defense Support Group (MDSG). The Under Secretary of Defense for Acquisition, Technology, and Logistics established this group in February 2002 to provide a continuing role in providing insights and advice throughout the development of the Ballistics Missile Defense System (BMDS). In this role, the MDSG will have regular access to BMDS program information on an ongoing basis.

Senator REED. Secretary Aldridge, just a follow-up point, if those goals and plans were not provided, are you going to follow through and ensure that this section of the law has been complied with in this budget cycle and in the future?

Secretary ALDRIDGE. Absolutely. The process last year was somewhat rapid and condensed, based upon a lot of reasons, starting with September 11. So, a lot of things we would probably have done in a normal year were not completed to the degree we would like.

I would just say the program content that has been submitted to Congress has gone through the Senior Executive Council, which is the Deputy Secretary, myself, and the Service Secretaries, along with the management structure. We all supported that particular activity.

Senator REED. Thank you, Mr. Secretary.

Mr. Secretary, in your testimony you indicate that the new missile defense program has the same reporting requirements to Congress that all other programs have. Section 2430 of Title 10 defines a Major Defense Acquisition Program, or an MDAP, as "an acquisition program that is not a highly sensitive classified program that is estimated by the Secretary of Defense to require an eventual total expenditure for research, development, test, and evaluation of more than $300 million." Virtually all major missile defense programs fall into that category, and in fact, as of December 2000, all major missile defense programs were MDAPs.

Section 2413 of Title 10 requires submission each year of an MDAP for the development schedule, including estimated annual costs until development is completed, the planned procurement schedule, including the best estimate of the Secretary Defense, and the annual cost and units to be produced.

It is my understanding that this information was not fully submitted to Congress. Why not?

Secretary ALDRIDGE. I think there is a definition problem with what a Major Defense Acquisition Program is. In the ballistic missile defense program we have laid out, it is undefined that any one of the elements is an MDAP until there is a decision to proceed with a deployment or some plan to proceed with the deployment in some future year. At this point in time, it is undefined as to what it is that we are going to build, what are the technologies we have in place. Right now, we are just working through a research and development program.

In any event, let me just say that there is no intent to deny Congress any information and that the plan is to provide all information required by Congress, by whatever provisions there are, both in terms of Selected Acquisition Reports, detailed budget information, and that type of data.

So, at this point, I think the question is a definition of an MDAP and what is the precise reporting requirement for the Department. Whether or not it is an MDAP, the data will be provided to Congress, sir.

Senator REED. Thank you very much, Mr. Secretary.

Again, just to clarify my understanding, many of these programs in the missile defense area were MDAPs as of December 2000 and became transformed into something other than an MDAP after that. Is that correct?

Secretary ALDRIDGE. That is correct. We terminated those programs as MDAPs because they did not fall into the definition of what a Major Defense Acquisition Program would be. But we certainly continue the program and keep the contracts, and we will report those to Congress whether or not they are MDAPs.

Senator REED. Well, you are as experienced as anyone, and you understand that this is one of those baseline information requirements that is not only helpful to Congress, but helpful to the management of the Department of Defense.

Secretary ALDRIDGE. Yes, sir, I do know that.

Senator REED. That raises a second question, which is, is it your position that the law is satisfied by your simply giving us the information? Or do you feel that you have to give this information to us?

Secretary ALDRIDGE. We have to give the information to you, sir.

Senator REED. Thank you very much, Mr. Secretary.

Now I would like to recognize Senator Allard.

Senator ALLARD. Thank you, Mr. Chairman.

Secretary Aldridge, General Kadish, and Mr. Christie, I want to welcome you.

Secretary Aldridge, one of the criticisms that seems to be creeping up from time to time in the press—I think following the last hearing, maybe we read a little bit about it—is that there are those who are suggesting that the way the Missile Defense Agency has

been reorganized reduces or even negates independent oversight of some missile defense programs.

Would you generally discuss the effectiveness in the past of OSD oversight for development and acquisition programs and talk about the need to improve or streamline the oversight processes?

Secretary ALDRIDGE. All right, sir. First of all, most of the activities in the Department of Defense on acquisition are associated with a single program, whether it is an F–22 or a Joint Strike Fighter, a ship, a tank, or a combat vehicle, and the process that occurs under those is very well-defined in milestones of A, B, and C. There are groups inside of the Department of Defense called Overarching Integrated Product Teams (OIPTs) that consist of individual members of the various organizations who look at these programs together and then make recommendations as they move through the milestones and through the decision process, usually through Defense Acquisition Boards (DABs). But those are associated with essentially a single type of program in which the individuals involved can talk to a program manager. He has a very specific thing to do, and the process works, I would say, well. We have done some things to improve it—and maybe we will talk about that later on—in trying to streamline that process even more.

In missile defense, it is a different issue. We have a program that is highly complex with a series of programs with sensors, with interceptors, with the command and control system, it is what we define as a system of systems. It is not any one program. It is a system of systems, which makes the acquisition process very difficult. What we were trying to do with this process is to try to keep the focus on getting a system deployed, but doing it in a way that takes into account that there are multiple systems that have to be reviewed from multiple offices.

We have 13 individuals through the Missile Defense Support Group that have equities in missile defense, but we have brought them together into a single team so that they have access to the same information from the MDA and they all are not going to the program individually at different times asking for different types of information. It is our view that with this Missile Defense Support Group, by having its 13 members working together, there is a synergy between individual members hearing things, hearing the thoughts of the other people on the team that can provide better oversight of what is going on in the missile defense program.

There is one other point, and that is that this is only during the research and development phase when this activity will be undertaken. When there is a decision to move a particular system, as we have done for the Army's PAC–3 system, then the acquisition system goes back to the normal process of the Defense Acquisition Boards. As these programs come out of missile defense and go to production and go to deployment, the normal DAB process will continue. So, the oversight responsibility we are talking about is that which exists only during the research and development phase.

I think what we have done here is to provide a unique ability to monitor this very complex system in a way that is going to give General Kadish the responsibility and authority to manage his program efficiently and yet still provide the Office of the Secretary of Defense and the other Services, which are members of this team,

including DOT&E, including the Joint Staff, the ability to see into the program for the purpose of advising me, the Missile Defense Agency, and the Senior Executive Council on new things to do.

Let me just say one short thing about acquisition streamlining. We have mandated now that spiral development shall be one of the milestones and characteristics of programs that we produce. What do we mean by spiral development? That is the ability to deploy something that is maybe not the 100 percent solution, but it is the 80 percent solution with an architecture that would allow that capability to be improved with time as technology matures. That is a way to get these systems in the field sooner with less risk, less cost uncertainty, change uncertainty, and it allows us to, in some cases, get older systems out of the field quicker or, in the case of missile defense, to get the system in the field quicker. So, that is one area that we have been focused on to streamline the process.

The other is in the Defense Acquisition Board, where we have reduced the size of the Defense Acquisition Board from 16 members to 10, and we now have included the Service Secretaries. So, the DAB is now the decision board of the Department for defense acquisition, and because the Service Secretaries sit on that board, the process works extremely well and much faster because they are the decision makers. We do not have to staff decisions after the board meets.

We are seeing the acquisitions process go much faster. In fact, in some cases, we do not have to have DAB meetings because the process does work.

Sir, that is probably a long answer to your short question.

Senator ALLARD. You took up all my time. [Laughter.]

Secretary ALDRIDGE. I am sure you will go around again.

Senator ALLARD. We wanted to have a full response and I appreciate your full response. When my time allows, I will come back with a follow-up question to Mr. Christie as to how he views his role.

Thank you, Mr. Chairman.

Senator REED. Thank you, Senator Allard.

Senator Nelson.

Senator BEN NELSON. Thank you, Mr. Chairman. I too appreciate you gentlemen being here today to help enlighten us as to the process with respect to budgeting for missile defense.

As you may recall from previous hearings and meetings, one of my concerns has been knowing when we are moving from research and development to deployment. I asked some of your colleagues will we know when we are there, because it was very difficult to try to dissect and delineate in the budget what was purely research and development and those elements that began to blur potential deployment or readiness for deployment.

We have gone 6 more months since those questions were appropriate, so what is the distinction between deployment and research and development?

Obviously, the concern is treaty obligations, but I think it is also a matter of budget concern even if we did not run the risk of being in violation of a current treaty. I would ask you, General Kadish, because we have had this sort of conversation previously.

General KADISH. Senator, the way the program is constructed, with the exception of PAC–3, which is in the early phases of procurement and deployment, all our efforts are oriented to research and development and the test infrastructure in order to support to that. We have not proposed to Secretary Aldridge or the Department specific deployments other than in PAC–3.

I suspect, however, that as we go forward in the coming months and years, we will be proposing those efforts based on the success or lack thereof of our research and development program.

I would also say that everything we are doing in terms of the application of the budget to fiscal year 2002 is still in compliance with the provisions of the ABM Treaty until June 13 or 14 of this year. We will continually evaluate that.

But our efforts right now are not to specifically produce elements for deployment activities, except for PAC–3.

Senator BEN NELSON. In that regard, with the suggestion that success may or may not be defined as the 100 percent solution, has there been any further effort to define what might be considered success in terms of testing that might lead to a request for deployment? What I am asking for is a percentage. Would it be 80 percent, 90 percent, or 50 percent? Give me some idea of what we would consider successful in terms of moving forward.

General KADISH. Senator, we are now in the process of refining our definitions, our understanding, but basically I think they are going to stay pretty much the same in terms of what we used to call single-shot probability of kill and the different measures we use for effectiveness. Rather than give you specific numbers in open testimony, I would rather provide them in a classified arrangement at the appropriate time.

Senator BEN NELSON. That would be fine. But are you working on what constitutes sufficient success so as to lead to a recommendation to deploy the system?

General KADISH. That is correct. This gets to be a very important part of this evolutionary capability approach that we are taking because success definitions will be an important part of the decision to move forward. Let me put it this way: Right now we have zero probability of intercepting a ballistic missile. Some judgment will have to be made as to whether or not anything greater than zero is useful, and those things will be a part of not only the technical judgments, but the operational judgments made by a larger group within the Department, in my view.

Senator BEN NELSON. I appreciate that very much. Obviously, I think all of us are hoping that the program can be successful and be a part of our national defense, certainly against the kind of weapons of mass destruction that may come our way, and being able to prevent that from happening is in everybody's best interest. I also think, though, given the fact that we are stretching dollars to do a lot of different things in the military budget, you can appreciate the fact that we are always going to be a little bit concerned about how much of our budget we put in missile defense. Certainly, research and development is one thing, but the standard has to be relatively high for us to be able to deploy a system. I appreciate the fact you are working on it.

Thank you.

Senator REED. Thank you, Senator Nelson.

Senator Inhofe.

Senator INHOFE. Thank you, Mr. Chairman.

First of all, let me echo what the chairman and others said. How great it is to have you three people in the positions that you are in at this time of great threat to our Nation. I appreciate your service very much.

This hearing is on acquisition and oversight. I would like to talk about the oversight portion of that.

First of all, General Kadish, just for clarification, you made reference in your testimony to the contingency capabilities of THAAD and the Ground-based Midcourse Defense. Now, some of the missile defense opponents out there seem to have misunderstood that this contingency capability is equivalent to operational deployment capability in these systems. I wonder if we could clarify this. My understanding is that if you have something that is not yet fully developed, it could still be used in the event that we have nothing else to use at that time. Would you clarify this?

General KADISH. Senator, there has been a lot of misunderstanding about this contingency capability, and you are right to try to clarify it.

Whether we are talking about missile defense or not, whether it is a Global Hawk or any other system, whenever you have a testing asset or something that is in testing for developmental purposes, you have an inherent capability because nothing existed before you built that. The question comes, in the way we have constructed our program, at what point in time would you be able to use a missile defense asset that is in testing to protect ourselves or deployed forces if the need arose and we were in some extreme situation? I think that the answer to that question is whenever we have a test asset that is under testing, if it is in the right position, if it could be used in an operational mode, just as we are using the Global Hawk today, which is in development, in Afghanistan for operational purposes.

The very fact that a test activity exists could be used for operational capability, but it will not be up to what the original standards that we were trying to develop a particular system for. You would pay a high price in a sense because you would not be able to do much more testing with that asset.

So, the idea of test assets being used in contingency operations when there is a wartime need, or in the case of missile defense, when there is a peacetime need to have that capability as a deterrent or otherwise, will always be there in our development process.

Senator INHOFE. The way I have stated it before is that if it is not perfect, it is better than nothing if nothing is what we have right now.

General KADISH. That is exactly right.

Senator INHOFE. I have gone through 8 or 9 years of being really distressed about the continued underestimating of the threat that is out there. I began to get concerned about this when President Clinton vetoed the National Defense Authorization Act for Fiscal Year 1995, and in his veto message, he said that the major reason was that there is money in there for a missile defense system and there is no threat. Of course, the NIE, the National Intelligence Es-

timate, of 1995 said that before a rogue nation would have any kind of capability, it would be many years. It was way out into the future, which we know, now, was not the case.

Later on we found that they used the word "indigenous." Well, to me it makes no difference whether a rogue nation develops a missile that can reach Washington, DC, that is indigenous or whether they buy it with technology from China or somebody else.

It was music to my ears on July 12, 2001, when Secretary Wolfowitz said, "While we have been debating the existence of the threat for nearly a decade, other countries have been busily acquiring, developing, and proliferating missile technology. We can afford to debate the threat no longer. We are in a race against time, and we are starting from behind, thanks in no small part to the constraints of the antiquated ABM Treaty."

Could you share with us your views on the growing likelihood of rogue nations having missile capability that would be a threat to us?

General KADISH. I guess the way I would like to start the answer to that question is that I review the intelligence data every day to make sure that we have consistency with our developmental program, and that we can be responsive to what we are actually designing against the threat. From a missile proliferation standpoint, the threats we see that are developing outside of Russia and China, they are significant, especially in the short-range and intermediate-range missiles, and moving very rapidly in my opinion to long-range missiles. So, we have a threat that is somewhat unprecedented for us in terms of missile proliferation and weapons of mass destruction.

Senator INHOFE. Secretary Aldridge, do you have any comments on that?

Secretary ALDRIDGE. Yes, sir. Just to highlight what General Kadish says, this is a missile defense program that is not just aimed at national missile defense. This is defense of our troops in the field, in addition to national missile defense. There is no doubt that there are threats of short-range, medium-range, and long-range. So, the threats that this system must deal with are there. They are being tested today in a wide variety of ways. So, there is no doubt that there is a threat. The threat is here. It is growing and the program we have laid out is a way to try to handle that.

The program is also dealing with intercepts at various stages of the missile's trajectory, in the terminal phase, in the midcourse phase, and we are working on the boost-phase intercept, which makes it very difficult for an adversary to design a countermeasure against all types of intercepts that we could employ in our system. So, not only must we deal with the current threat, we must think about the future threats as they evolve. Our program, as it is laid out, is designed exactly for that reason.

Senator INHOFE. My time has expired and I do want to follow through with this later. I am glad we are no longer talking about a national missile defense system and a theater missile defense system as though they are unrelated but we are talking about a defense system against a missile.

Thank you, Mr. Chairman.

Senator REED. Thank you, Senator Inhofe.

Senator Smith.

Senator SMITH. That is a long time coming. I am glad to hear we finally are talking about it that way.

Gentlemen, the Department has canceled these Operational Requirements Documents (ORDs) as they pertain to missile defense programs. They defined in some detail, or tried to, just what the capabilities of the system would be at the time it was developed and deployed. It seems to me that is consistent with what you are trying to do in terms of the flexibility for a spiral development process.

Let me ask you first, Mr. Secretary, what is the alternative process here to ensure that the architecture of missile defense will head us toward an integrated solution? You have at least some idea down the road where we are headed. I do not think I can think of any particular system, from some military requirement or even building a car, for that matter where if you do not have some idea of what your end goal is as to what its function is, how you can continue to develop it?

Secretary ALDRIDGE. Sir, I believe we are taking a slightly different approach in missile defense, and the approach we are taking is called capabilities-based. It is different from an ORD that would say to you, you would not deploy a system until it achieves a .95 kill probability against 10 rockets or 10 ballistic missiles within 5 minutes. If General Kadish could say I can shoot down 8 of these missiles, it is going to take me 6 minutes with a kill probability of .9, it may be sufficient that we say that is a capability we believe we need. It is adequate for our needs to protect our country at this time against that threat.

Then what we would do is, if we deployed it, because it was a capability that we believed we needed, we could improve it with time so that pretty soon it could do 10 missiles in 5 minutes and then maybe 50 missiles in 1 minute. So, the idea of a capabilities-based decision to deploy is that it gives us what we need at the time, irrespective of whether or not we had an operational requirement for certain probabilities.

This is not serving our needs at this time for this program. It serves other programs perfectly fine where there may be a more well-defined threat, a certain armor plating thickness, and things of that nature. For this system, that is not appropriate.

Senator SMITH. General Kadish, with respect to the warfighter, how are we going to ensure that he believes that it is going to be militarily useful for him?

General KADISH. The essence of the capability-based approach and spiral development is that we have a tight linkage with the warfighter and the developer at the same time. Traditional ORD documentation gives you a time period where warfighters specify a requirement and then give it to the developers that write them in the specifications and then we give it to a contractor.

This effort is for us to try to do that together, given the fact that we can now make trades among different system elements that we did not think about before because we had an ORD for a Navy Theater-Wide system and we had an ORD for a national missile defense system. Now we can look at sensors and missiles, interceptors, and communications systems that bring these together, and

our hope is that we are going to be able to make a better system among those elements doing it without the ORD specifications and in a faster time line.

Senator SMITH. I do not think it is arguable that probably the most mature BMD System that we have now is the PAC–3. Right? I think we would all agree on that.

Just using that as a yardstick, did the PAC–3 ORD that was laid out a few years ago accurately or inaccurately come close at all to reflecting the threats that we now expect the PAC–3 to deal with?

General KADISH. It put us in the ballpark, but we are dealing with threats now that are much different than what PAC–3 was originally specified to counter. That is part of the problem with threat-based, ORD-based requirements because you have to deal with an exquisitely defined intelligence threat that may or may not be wrong. So, although we have a general capability with PAC–3 that is pretty good, we still do not meet all the definitions of threats that we had set out to accomplish with that particular effort.

Now, we are going to upgrade it over time. That is the whole idea with all our elements, but that is the nature of the threat that we have to deal with. If a threat was specified in the ORD document to go 1,000 kilometers and we find out it goes 1,200 kilometers, that is a difference in the requirement.

Senator SMITH. A lot of criticism was thrown out there, over the past 12 years that I have been on this committee. The term "redundancy" has been used a number of times in terms of the systems, which I never really believed was the case. But if there was some redundancy—and apparently that seems to be the conclusion now because of the way we are moving toward elimination of some of these systems—was any of that caused by, in your opinion, the demarcation that we used with the ABM Treaty between theater and national missile defense systems? Could we have avoided a lot of wasted money and perhaps gone quicker toward the more integrated system if we had not been dealing with trying to finesse that ABM Treaty as to what was theater, what was not theater, et cetera?

Secretary ALDRIDGE. That is a hard one.

Prior to this time, prior to the time that General Kadish and the Secretary reorganized the program to include a much broader scale of intercept zones, as well as ballistic missile ranges that we wanted to detect, the program was designed with the ABM Treaty in mind, with its restrictions. Since that time, we have designed the program without the ABM Treaty, although we are abiding by the provisions of the treaty and we are not doing things that we could be doing in the test program that would give us additional information that would aid decisions for the future. We are not now doing those until we get to June 13. So, there has been some degradation of the information that we would have available because of the ABM Treaty, and I believe the President, looking at that and the needs for the future—that is the reason he has made the decision to withdraw from that treaty because it will, in fact, impede us in the future.

Senator SMITH. Thank you. That is a good answer. I appreciate it.

Senator REED. Thank you, Senator Smith.

Senator Akaka.

Senator AKAKA. Thank you, Mr. Chairman. I would like to make a brief statement and have my full statement placed in the record.

Senator REED. Without objection, Senator.

Senator AKAKA. On Monday, I chaired an open session of the International Security and Proliferation Subcommittee of the Governmental Affairs Committee, at which the Central Intelligence Agency's National Intelligence Officer for Strategic and Nuclear Program's, Robert Walpole, testified. Mr. Walpole made three points in that hearing which are worth repeating today.

First, the immediate threat to American forward-deployed forces and allies comes from short- and medium-range ballistic missiles and land attack cruise missiles.

Second, United States territory is more likely to be attacked with weapons of mass destruction using non-missile means.

Third, some countries with ballistic missile systems, such as Iran and North Korea, are upgrading their capability to launch ICBMs, but Iran is not likely to attempt to test launch an ICBM until the last half of the decade.

These conclusions suggest our missile defense program should concentrate on the immediate threat while designing and testing the capability to address the long-term threat from rogue states.

I thought I would share that in this meeting.

[The prepared statement of Senator Akaka follows:]

PREPARED STATEMENT BY SENATOR DANIEL K. AKAKA

Thank you, Mr. Chairman, for holding this hearing. This is a critical issue that deserves all the attention you are giving it.

On Monday, I chaired an open session of the International Security Subcommittee of the Governmental Affairs Committee at which the Central Intelligence Agency's National Intelligence Officer for Strategic and Nuclear Programs, Robert Walpole, testified.

Mr. Walpole made three points in that hearing which are worth repeating today:

First, the immediate threat to American forward-deployed forces and allies comes from short- and medium-range ballistic missile and land-attack cruise missiles.

Second, United States territory is more likely to be attacked with weapons of mass destruction using nonmissile means.

Third, some countries with ballistic missile systems, such as Iran and North Korea, are upgrading their capability to launch ICBMs, but Iran is not likely to attempt to test launch an ICBM until the last half of the decade.

These conclusions suggest our missile defense program should concentrate on the immediate threat while designing and testing the capability to address the long term threat from rogue states.

I am concerned that the new, $7 billion "capabilities-based" program being proposed by the administration for missile defense does not ensure that we will have a missile defense system capable of doing anything well. Rather than taking a targeted approach which would ensure the development of a missile defense capability, the proposed program seems to take a shot-gun approach, scattering our money and technical expertise across a range of too many technologies.

In addition, the budget documents presented to Congress so far seem more notional than real. This would not be of concern if the administration was presenting us with a hypothetical program, but unfortunately these are real dollars which the President wants Congress to approve now and commit to in the out-years. Without more specific justification and numbers, it is hard to understand how the administration has arrived at this $7 billion-plus program.

Moreover, the administration wants to remove this program from the normal checks and balances of a major acquisition program, cancelling the Operational Requirements Documents and excluding the Pentagon's Director of Operational Test and Evaluation from his usual oversight.

Instead, the administration is proposing that part of the job of overseeing whether or not the program is functioning properly be done by the major industry contractors involved in developing the program. This is a bit like putting the fox in charge of the henhouse. Enron did this with its outside auditors, and we know how well that worked.

We *need* a missile defense capability. We *need* it sooner rather than later, but we *need* it to work against real world enemies. I am not certain that the approach being proposed by the administration achieves either objective.

Thank you, and I look forward to the testimony.

Senator AKAKA. Mr. Secretary, according to a memorandum from the Secretary of Defense, the Missile Defense Agency will no longer rely upon system threat assessment reports developed by the Defense Department's intelligence agencies, but will develop a unique document called an adversary capabilities document.

My question is, will the preparation of the adversary capabilities document require that the Missile Defense Agency duplicate functions performed by other parts of the Department of Defense?

Secretary ALDRIDGE. No, sir. The threat capabilities document will be based upon the work of multiple defense agencies as inputs. It is really the document that the Missile Defense Agency needs to have with that type of data so they can design missile defense systems against these capabilities, but there is no intent to duplicate what is going on in the other agencies, certainly in the intelligence agencies.

General KADISH. If I could add to that, Senator Akaka.

Senator AKAKA. Yes, General.

General KADISH. Where we have an intelligence estimate that defines the threat, it will include automatically that intelligence estimate. But what we are trying to do is work with the capabilities-based approach, where we define parameters larger than that threat estimate, for instance. They tend to be point-designed solutions given to us about what the threat looks like. We would like to hedge the uncertainty of us making a mistake in that area, and go to what we call physics-based assessments and look at the physical parameters that could be around that threat and design, as best we can, for those parameters which would include the specific definition by the intelligence community. So, it is a much more effective way in my view of defining the threat for our purposes.

Senator AKAKA. The Secretary's memorandum directs the Under Secretary of Defense for Acquisition, Technology, and Logistics to base production decisions on initial performance demonstrated through credible testing, availability of system alternatives, and threat evolution.

Would initial performance be based on developmental testing, operational testing, or some other form of testing?

Secretary ALDRIDGE. It will be based on the developmental testing to date, but it will continue after that decision to ensure that when we get to the point of becoming operational, there will be additional tests to be done. That will become part of Mr. Christie's office, to look at the operational side of things, while he is continuing to oversee the development testing as well through our Missile Defense Support Group.

Senator AKAKA. In that memorandum too, the Secretary directed the Under Secretary of Defense for Acquisition, Technology, and

Logistics to plan and execute work such that it may be truncated or stopped under certain circumstances.

What metrics will be used to determine which programs will be truncated or stopped?

Secretary ALDRIDGE. Sir, we have laid out a program for missile defense that, in some cases, has multiple or parallel technology paths that may or may not work. If at any point we see that the technology is not performing at the level that we desire, the cost is growing too large, or the schedule is not sufficient to meet the architecture we laid out for missile defense, we will make a decision as to whether to proceed on that program or not.

There is a process in place by which that is done. Major decisions of that kind will be made by the Senior Executive Council, which essentially will be the board of directors. They will make a recommendation. Of course, the Secretary of Defense, the President, and ultimately Congress have to support that decision of whether or not to deploy where a capability that has been demonstrated is sufficient to meet the needs of the Nation at that time. So, it is elevated at a higher level and a variety of metrics will be determined.

We were faced with a problem just recently with the Navy Area terminal defense system, which exceeded its cost estimates, and we faced up to that decision and decided to terminate that program because it was not under control, as it was defined, and it violated the Nunn-McCurdy Act. It was given to me for the purpose of certification that the program should continue, and I could not meet the certification criteria to continue the program and I terminated it.

Senator AKAKA. In the January 2, 2002 memorandum, the Secretary directed the Missile Defense Agency's director to use transactions other than contracts, grants, or cooperative agreements to carry out applied and advanced research. So, what selection criteria will determine whether the agency uses other transactions for a project?

Secretary ALDRIDGE. I would like to ask General Kadish to address that, if I could.

Senator AKAKA. General.

General KADISH. We intend to use the other transactions authority based on the authority being granted in the first place for prototyping and rapid acquisition activities. For the most part, however, I see us, at least at this point in time, using the traditional authorities for our major efforts. But where it is appropriate—and it gets to be a judgment call at some point in the process—we will use the other transaction authority for our beneficial purposes. But as a matter of fact, I think that over time we will basically use the contracting authority that is in the Federal acquisition regulations, but we will look every time at whether other transaction authority makes sense.

Senator AKAKA. Thank you very much for your responses.

Senator REED. Thank you, Senator Akaka.

Senator Warner.

Senator WARNER. Mr. Chairman, thank you for allowing a former member of this subcommittee to join you today. Senator Allard, you do a fine job as ranking member for this subcommittee and I com-

mend you and Senator Reed. I have sat in both of those seats in years past.

Mr. Secretary, welcome. You are an old friend and an old colleague.

Senator Smith asked a key question relative to the ABM Treaty, and I have propounded that same question I think for almost 24 consecutive years to previous panels here. Consistently impartial observations by your predecessors, both uniformed and civilian, have been that this Nation was going to comply with the ABM Treaty, but that we recognized that the treaty imposed, in all probability, delays, higher costs, and the possibility of, in the end, getting a system which was more expensive, took longer to build, and could not be as efficient and as effective. Therefore, I commend the President for his decision to withdraw from the treaty, and hopefully you will reappear before this subcommittee after the withdrawal date and we will look at what your new ideas are.

I would like to ask you about the Arrow program. Congress has been supportive of the Arrow program. Mr. Secretary, what provisions do we have this year, in terms of funding and sharing of technology, for Arrow? General, what is your professional view as to the effectiveness of the Arrow system, because I think there has been a rather dramatic breakthrough in missile defense in Israel.

Secretary ALDRIDGE. Senator, we certainly have been following that program for quite a few years and it has been a successful program. We have funding in the budget request to continue that. We have also provided co-production for producing that missile in our country. I do not recall the numbers. General Kadish can address that, but it is certainly something that has been supported by previous administrations, and this administration, and I will let General Kadish talk about where we think we are headed.

General KADISH. Senator, I think we have close to a billion dollars in investment in the Arrow program with the Israelis. They declared it operational, I think 8 or 9 months ago. I would have to get you the exact date. It is the only blast fragmentation, non-nuclear missile defense system deployed in the world today.

It is effective. The flight tests have shown that they can reach the parameters that they are going after and they can destroy the missiles. As Secretary Aldridge said, we have a continuing relationship with the Israelis. I believe the number is on the order of $60 million in this budget request. I would have to get you the exact number for the record.

[The information referred to follows:]

Successful tests of the Arrow Weapons System, particularly the September 14, 2000, intercept flight test, prompted the Israel Defense Force (IDF) to declare the Arrow operational effective October 17, 2000.

[In millions of dollars]

The fiscal year 2003 funding breakout is as follows:

Arrow System Improvement Program	55
Co-manufacturing	5
Israeli Test Bed	3
Israel System Architecture & Integration	2
Program Support	1
Total	66

Section 8112 of the Fiscal Year 2002 Defense Appropriations Act provided additional funds for establishing an Arrow production capability in the United States, and MDA has programmed $40 million for this purpose. In response to that direction, the U.S.-Israel Arrow Co-Production Capability Development (ACCD) program will provide for establishing in the United States, by the end of fiscal year 2004, the capability of U.S. co-produced Missile Technology Control Regime (MTCR) Category II and non-MTCR controlled Arrow missile components to assist Israel with Israeli co-produced components, assembled by Israel into prototype Arrow missiles, and tested in Israel to qualify both nations' Arrow missile component co-production lines. The MDA has programmed $45 million ($40 million in fiscal year 2002 and $5 million in fiscal year 2003) for the ACCD which includes only pre-production activities.

Senator WARNER. I think that is correct. But their test program has been exemplary.

General KADISH. Yes, it has. They have had their failures just like we have, but the record of success has proven the adequacy of the program.

Senator WARNER. Is it a system that has the potential to augment our own PAC–3 and other defensive measures?

General KADISH. Yes, Senator, it does. We have done numerous interoperability demonstrations with Israel to ensure that we can have interoperability and provide a layered-like defense using Patriot, and those have been very successful.

In the future, we are going to be looking harder at this as time goes on and as we look at the overall Ballistic Missile Defense Systems that we are going to be investigating from a technical standpoint. So, it certainly has a large impact and a large usefulness for the Israelis, and other uses of it will have to be determined in the future, if any.

Senator WARNER. Is another use possibly incorporating it in our own inventory of defenses?

General KADISH. I would not rule that out, but from a technical standpoint, there are other issues associated that are programmatic, and budgetary, and it would have to go through a review. But anything that contributes to our missile defense capability is a good thing from my perspective.

Senator WARNER. I think it is worthy of that consideration.

I thank the chairman and the ranking member.

Senator REED. Thank you very much, Senator Warner.

Mr. Christie, in your statement for today's hearing, you said that you wanted to assure that DOT&E's access to Missile Defense Agency plans and programs is adequate for us to accomplish our oversight mission, which is a sentiment I certainly applaud. Can you ensure that proper robust testing is planned and executed for the missile defense system if you and your staff and support contractors are not involved in test planning?

Mr. CHRISTIE. I did not say that we are not involved in the test planning.

Let me back up a little bit to last summer. Shortly after I was confirmed, I met with both Secretary Aldridge and General Kadish about how we would go about executing our oversight responsibilities as General Kadish was restructuring the program. By mutual agreement, I backed off until the programs were restructured before my staff became more intimately involved. Now, we continued to exercise our oversight on PAC–3, since that was entering oper-

ational testing, but heretofore until the first of the year, we had not been intimately involved.

We are involved now, and I have no reason to believe that we will not be able to carry out our normal oversight responsibilities to include being involved with the MDA in their test planning activities, as well as observing the tests, evaluating the results, and providing an independent evaluation of those results.

Senator REED. But at this point, with the exception of PAC–3, you are not personally, nor is your staff, intimately knowledgeable about the details of these programs?

Mr. CHRISTIE. Oh, I would not say that. I am not sure I am intimately knowledgeable on all those programs, but I think we have had access to all of their documentation since it was presented to Congress. So, we are getting into the details of all the programs. Accordingly, I would not characterize us as not having access.

Senator REED. Would you characterize your access as unfettered, not just yourself but all of your staff members and relevant contractors, anyone that you would want to have access?

Mr. CHRISTIE. I cannot answer that in a positive manner at this point because we are still evolving in this process. My agreements with General Kadish and the work between my staff and his show no indication that that is not going to be case. I cannot say at this point in time that we have unfettered access to what is going on there, but I have no reason to believe that we will not as time evolves.

Senator REED. Mr. Christie, Secretary Aldridge, and General Kadish, as I understand Title 10, the Director is given specific statutory authority, access to all records and data in the Department of Defense, including the records and data of each Military Department that the Director considers necessary to review in order to carry out his duties under the section. So, it would appear to me, statutorily, that Mr. Christie can have access to any data, without agreements, from anyone in the Department. Is that your understanding, Secretary Aldridge?

Secretary ALDRIDGE. That is my understanding.

Senator REED. That is, indeed, the policy.

Secretary ALDRIDGE. Yes.

Senator REED. Thank you.

Let me return to an issue that was raised previously about contingency deployments and General Kadish's explanation of the confusion. But let me take it from this perspective.

The administration proposes to buy hardware in 2003 to support contingency deployments in 2004 for a number of missile defenses, including national missile defense, THAAD, Navy Theater Wide, and the Airborne Laser (ABL).

In the past, for virtually all major defense programs, a rigorous set of operational tests has been performed prior to a deployment, contingency or otherwise, and it was done for obvious reasons, to make sure the systems actually work before you raise not only the expectations that they will work among the American public, but also the reliance that the military will put upon these systems.

Now, Mr. Christie, you are in charge of operational testing. Are there any plans to conduct any operational testing on any of these missile defense programs prior to 2004?

Mr. CHRISTIE. The programs you mentioned? I do not think so. I think a 2004 decision, if it happens, will be based primarily on technical testing, if such a decision to deploy is made. My view is at that point in time I will be called upon or my office will, in fact, have the responsibility to report to General Kadish and to Secretary Aldridge and to the Secretary our view, based on the testing to date, of what capability we have attained or demonstrated, so to speak, so that the decision makers can, in fact, make an informed decision as to whether to deploy that capability.

On the matter of operational testing before deploying for contingencies, I think as General Kadish mentioned, over the years I can mention several systems that have been deployed operationally: JSTARS in the Persian Gulf War, Predator in both Bosnia and Kosovo, as well as in Afghanistan, and Global Hawk. We have done that in the past. We have done that based on an evaluation by the decision makers of the technical testing up to that point. There had been no operational testing of those systems in their initial deployments.

I am not advocating that is the way to go. I am just saying that is just a fact of life.

Senator REED. But those operational tests were not performed. I presumed they were being planned, though?

Mr. CHRISTIE. Oh, yes. There are operational tests planned with the midcourse system that we are talking about here, which could be deployed with a decision in 2004. There are operational tests planned. As I recall that data, I do not think they will take place before a possible decision in 2004 is made.

Senator REED. With all of the systems you indicated, was their deployment driven by a conflict?

Mr. CHRISTIE. Or a perceived need, yes, in a conflict.

Senator REED. Here, it seems to me, an arbitrary date has been selected of 2004 that will preclude operational testing before that date. Is that true?

Mr. CHRISTIE. Well, I do not think in the progress of the program that we will have come to the point where we will be planning to execute operational testing. I think we are planning a series of technical tests, flight tests, as a matter of fact, with this system, with an average of four tests a year up to that point.

Senator REED. Senator Allard, can I ask your indulgence to ask General Kadish a question? I will let you respond. But can I have an additional minute?

Senator ALLARD. Yes, that will be fine.

General KADISH. You mentioned 2004. That is where we are working on the ground-based system against long-range threats to have our testbed in place, which would include up to five missiles available. We expect that we could make that date for the testbed purposes. As we go further in time from now on, based on the testing and developmental testing that we intend to do, there may be a decision at some point to actually use those assets. But the date that we have is for the testbed capability to be put into place so we can add it to our test requirements.

Senator REED. Then we are talking now in terms of national missile defense, the old land-based system, if you will.

General KADISH. It is the land-based system, right.

Senator REED. Do you have any operational test plans for the land-based system prior to 2004?

General KADISH. We have plans for developmental testing that the operational testers will participate in. They are not classified as operational tests. We expect to do operational testing in our planning as we transition to procurement, and that is usually when it is done in any program.

Senator REED. Let me ask a follow-up question just so I understand. In one of your previous comments, talking about the contingency deployment, you said you suffer a loss because you cannot use them as you would a normal test item?

General KADISH. That is correct.

Senator REED. So, we face the possibility of declaring a deployment of the land-based system in 2004 without operational testing and, as a result of that deployment, not being able to fully test those deployed missiles. Is that a possibility?

General KADISH. When you say fully test, the fact that it is actually being used is a test in and of itself. But it would not be according to our original test plans, if that is the concern that you have.

But just like anything else, if we use JSTARS, Global Hawk, or Predator, the using community and the developing community on those systems learn an awful lot that they would not have learned in a very sterile test program. So, the operational use of those systems in my view leads to a better follow-on improvement of the system.

Senator REED. Thank you, General.

Senator Allard.

Senator ALLARD. Thank you, Mr. Chairman.

I want to go back to a question, Mr. Chairman, that you asked Mr. Christie. Mr. Christie, you had indicated that you had not reviewed the Missile Defense Agency program goals, according to a question from the chairman early on, in this year's budget as required by section 232 of last year's defense authorization bill. I would just like to note for the record that our bill was not passed until late December, and was that the reason why the required review was not done this year?

Mr. CHRISTIE. Well, that contributed to it, but I think the major reason was that they were still in a state of flux in getting their budget materials together until the last moment.

Senator ALLARD. But you would not go and begin to apply the law before it was signed by the President and had become law, would you?

Mr. CHRISTIE. That is right.

Senator ALLARD. So, then a plausible explanation for that is the President's budget process was on the way. When do you start the budget process? In the middle of the year, June?

Mr. CHRISTIE. The summer, yes.

Senator ALLARD. You need to have it ready by December in order for the President to present his budget when we come back into session. Is that correct?

Mr. CHRISTIE. Yes.

Secretary ALDRIDGE. Well, in fact, this year we did not even start the budget process until October for lots of reasons. One, getting

the team. The team for Secretary Rumsfeld was not even on board until June.

Senator ALLARD. Congress had not passed the defense authorization bill providing for the section 203 compliance. So, I would suspect that this year you will have an opportunity to review it. Correct?

Mr. CHRISTIE. Absolutely.

Senator ALLARD. I also wanted to follow up a little bit on discussions that I was having earlier with Secretary Aldridge. I asked him to give a general overview about the development and acquisition programs and whether they needed to be streamlined or not, if you will recall.

Mr. Christie, are you satisfied that you had adequate insight and input into missile defense test programs? Will your role differ in the Missile Defense Agency technology development efforts compared to other technology development programs?

Mr. CHRISTIE. Well, in answering the latter question, I would answer that we are dealing with what is called a capabilities-based process here, and I envision my responsibilities at various points, at least annually and certainly in response to congressional requirements, to evaluate what testing has taken place, what testing is in fact planned, and to provide an independent assessment to the decision makers as to what capabilities we have, in fact, demonstrated in testing, whether it be technical or operational at that point, against what threats. We will address what kind of capability will we have if we were to, in fact, produce this system or deploy it. So, that is how I envision our working in this context.

That is certainly different than the large programs such as F–22 or the other standard Major Defense Acquisition Programs where we have a statutory responsibility for deciding or evaluating the effectiveness and suitability of a system and the adequacy of the operational testing that took place before a system is, in fact, produced and deployed. So, it is different.

We are evolving. We will evolve in this process. We have not been there before.

Senator ALLARD. Secretary Aldridge and General Kadish, I am looking at a chart here about flight and major ground tests which are slated for 2002, 2003, and 2004. This is the Missile Defense Agency program overview report issued February 22, of this year, by Dr. Lamartin. I am looking at this chart, and it looks to me like we have a large number of Midcourse Defense segment tests designed from 2002 to 2007. A large number of those have a ground-based element in them, and then we even have a sea-based element in those also. This is on the flight and major ground tests. I would like to make it a part of the record and perhaps maybe you would like to comment further on these planned flight and major ground tests.

Secretary ALDRIDGE. I think General Kadish is probably better able to answer that question, sir.

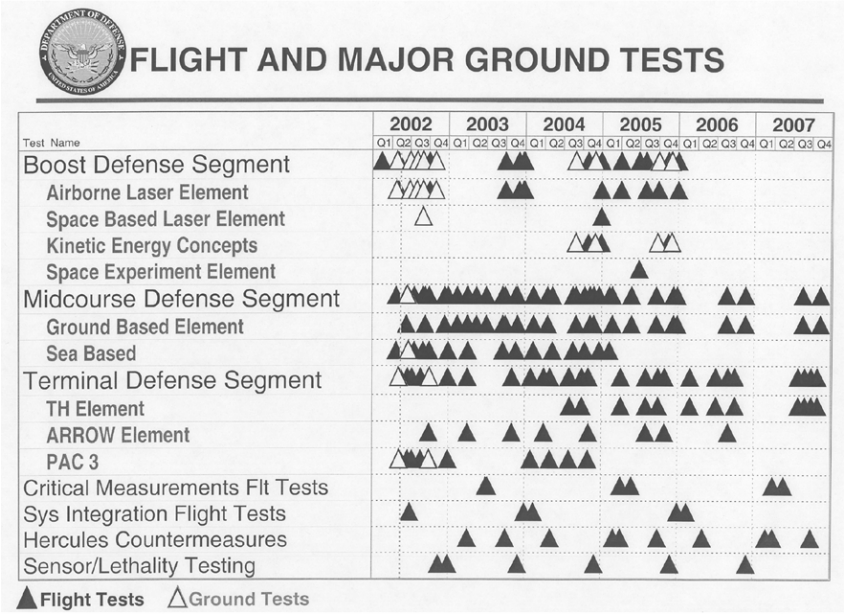
General KADISH. Senator Allard, I think that the schedule we have in testing reflects the fact that we took action to make our test program much more robust than it has been in previous years, and to put the testbed and the infrastructure in place to do it. We put a lot of money in the budget to do that.

I might say that we welcome Mr. Christie and his organization's involvement in this. In fact, if you go back and trace the heritage of that test program that you alluded to, that heritage is built on the fact that there was an awful lot of input from DOT&E and others inside and outside of the Government about the inadequacy of our test plans because of budgetary and other limitations. We have addressed that in great detail, and frankly, it would surprise me if we had those kinds of criticisms again as a result of any review of our test program. We are trying very hard to make sure that we can test realistically, that we can test frequently, and that we can test to our own satisfaction that these systems will work as intended. There is no intent on our part—and it is certainly reflected in the large amount of dollars allocated in this budget for testing and research and development—to avoid any kind of accountability in testing.

Senator ALLARD. Mr. Chairman, I would like to make that chart a part of the record.

Senator REED. Without objection.

[The information referred to follows:]



Senator ALLARD. Mr. Chairman, if I might have a little indulgence from you.

Senator REED. Please.

Senator ALLARD. Then I am going to wrap it up here.

Senator REED. I have additional questions.

Senator ALLARD. The General Accounting Office has put out a series of studies at the request of this committee—and I am going to address this to you, General Kadish—that detail how the defense acquisition system might be improved based on commercial and public sector best practices. Some of these practices included sepa-

rating technology development from product development, maturing technologies before using them in programs, using prototypes to demonstrate design stability, and proving through testing that the design is capable.

General Kadish, are you familiar with these reports? Could you describe the areas of consistency between the GAO recommendations and the Missile Defense Agency acquisition process?

General KADISH. Senator, I am familiar with the reports, and if I could, I would like to take that question for the record to be more detailed in answering the question.

But in general, it is my view that we took an awful lot of best practices all the way from the National Reconnaissance Office early operational methods to many different ways of adopting best practices. I am confident that if we laid out those issues pointed out in the GAO reports on improving management, we would have a high percentage of those recommendations adopted in our approach.

Senator ALLARD. I understand that is a complex question. Would you submit a written answer in more detail to the subcommittee, and then also not only talk about where the similarities are but point out some areas where there might be some differences, if any?

General KADISH. Yes, sir.

[The information referred to follows:]

The GAO has developed several reports on the topic of "Best Practices." The GAO testimony of May 10, 2000, focused on best commercial practices for developing new products and provides a summary of those practices. The testimony acknowledged that DOD has taken steps to reflect best commercial practices in its acquisition policies. MDA has also adopted many of those recommendations in its acquisition approach.

The major theme of GAO's assessment is the management of technology; specifically separating technology and product development. The BMD program is structured to target technologies for production only when sufficient maturity is reached. The effort is based on a "fly before buy" strategy. Multiple technologies will be aggressively demonstrated and subject to early, robust, and realistic testing. Parallel development is used to reduce risk in the RDT&E effort. Progress in testing will influence the decision process to stop, slow, or accelerate individual projects. Robust testing, modeling, and simulation are key tenants of MDA's strategy to increase knowledge and reduce risk. Only when a capability is sufficiently verified will that element or component be ready for a production decision. MDA's approach clearly helps to isolate technology development from production. Additionally, procurement decisions will be further assessed on performance relative to the overall integrated system construct.

GAO found that most successful firms limit production timelines from 18 months to just over 4 years. This limitation kept companies focused on delivering a product. The missile defense evolutionary acquisition strategy uses a capability, biannual "block" method that reflects a similar approach. Under this strategy, blocks of operational system capabilities based on demonstrated, mature technology are developed, produced, and fielded in increments. This approach keeps the program focused on delivering advanced capabilities to the field as quickly as possible. BMD biennial blocks also capture pre-production capabilities that are available for contingency/emergency fielding. Successive increments integrate improved technology to upgrade the system and improve existing capabilities.

According to GAO, matching customer need with proven technology is an important success factor. MDA's evolutionary acquisition strategy will provide proven mature technology and capabilities. User needs will be addressed by an ongoing analysis of potential adversary missile characteristics determined by existing evidence and technically-feasible engineering limits. The assessment to optimize the system against the need and match required performance with the capability of technology is made in collaboration with research centers, industry, and the Services.

GAO found that making production a concern during development forces discipline and trade-offs in design. This environment encourages realistic assessments of risks and costs. Production is always a concern in the commercial sector because unless a product can be produced at a cost that the customer will buy (and make the company a profit) it makes no sense to pursue development. While the profit motive is not a issue in DOD, production is still a major concern because failure to both control production costs and meet performance needs puts the project at risk.

One approach MDA has pursued to manage those two goals is to improve communication and cooperation among RDT&E, production, and user groups to better focus the development process. In support of that concept, MDA has established a collaborative effort, the National Team, to better leverage industry (production) talent and innovation at the very beginning of the development effort. In addition to defense industry leaders, the National Team is bringing together federally funded research development centers (FFRDC) and support contractors to share information and bring creative solutions to problems early in the design process. The National Team adds industry rigor to the engineering process by addressing prodution and supportability issues while focusing on integrating elements into a cohesive single system. This multidisciplinary team also addresses critical issues such as system specifications and block configurations. The approach balances the "future focus" of research groups with the industry focus of preventing overreaching and getting a useful product delivered to the user.

Underlying MDA's management approach is a commitment to successfully deliver affordable and effective missile defense capabilities to the Nation as quickly as possible.

MDA's management approach reflects the intent behind the best commercial practices reported by the GAO. Overall, two factors result in some differences between commercial practices and those used by MDA. Private sector companies function in a different, more "closed" environment than Government agencies. Profit—not development—is the critical success factor that drives decisions. Multiyear capital resources commitments are the norm. Government agencies function in more open environments with more diverse "stakeholder" interests to address. Also, Government capital resources are committed and justified on a yearly basis.

Commercial development is usually an incremental improvement to an existing product. There is considerable high-fidelity predecessor in-house knowledge in all areas of development. While MDA's "block" strategy will eventually get to the same point, we are not there now. In many areas we have to manage more technology risk than we prefer, particularly as we develop initial capabilities. That is why robust testing, modeling, and simulation are key to our effort.

The GAO's overarching recommendation is to structure programs to support research and development to advance technology and then to establish a basis for determining which technologies and subsystems meet performance standards for development. MDA's capabilities-based, evolutionary acquisition clearly parallels that approach. MDA is committed to vigorously investigating and pursuing any practices that will improve the outcome of this critical national priority.

Secretary ALDRIDGE. Senator, if I could just comment. It is not often I agree with GAO reports, but in this particular case, many of the recommendations there do follow along with what we are trying to do in the acquisition business across the Department of Defense.

In fact, this idea of not doing technology until it is available is in fact the essence of spiral development. We will deploy those technologies which are available and we will wait for those technologies to evolve before we try to enter them into new equipment in the future.

Prototyping is clearly something that is on our list. In fact, we have increased the funding request for doing advance concept technology demonstrators this year from $159 million appropriated last year to $200 million. We are going to start to do some new things, especially as those apply to counterterrorism prototypes.

Senator ALLARD. Mr. Chairman, I would like to submit to the witnesses maybe one or two questions after the hearing. I think it is standard that we can do that.

Senator REED. It is standard procedure. The record will remain open for additional questions and also for the statements of members.

Senator ALLARD. Yes, I will submit some more. I have wrapped up my questions.

Senator REED. Thank you, Senator Allard.

Chairman Levin.

Chairman LEVIN. Thank you very much, Mr. Chairman.

Let me first start with Secretary Aldridge. When we questioned the Service Chiefs at last week's full committee hearing, each of the Services said that they had not been consulted at all on the level of funding in the missile defense budget. Can you tell me why they were not consulted?

Secretary ALDRIDGE. Sir, we have a process in the Department where the Service Secretaries were involved with the budgetary process. If they did not share that information with their Service Chiefs, that was perhaps something they could have done and should have done.

The Senior Executive Council of the Department has reviewed the missile defense program. It has been reviewed in detail by the Secretary of Defense. We went over the management functions. We went over the budgetary items, the concept of the missile defense program, and that was reviewed and approved by the Senior Executive Council which results in the budget that has been submitted.

But the Service Secretaries were involved. I was heavily involved, the Deputy Secretary and the Secretary, and the program of record is the one that we have agreed is the right thing for us to proceed with. I do not know why the Service Secretaries did not share that information with the Service Chiefs.

Chairman LEVIN. Is it a little unusual, in your view, that the uniformed Service Chiefs were not involved in this consideration of the budget on missile defense?

Secretary ALDRIDGE. I would have thought that the Service Secretaries would have shared that information. Since this is a separate defense agency that deals with a variety of Services and activities, I cannot answer why they did not share that, sir.

Chairman LEVIN. Secretary Aldridge, the Joint Requirements Oversight Council, the JROC, which is headed by the Chairman of the Joint Chiefs, is required by law to "assist the Chairman in identifying and assessing the priority of joint military requirements to meet the National Military Strategy." The JROC is also required by law to evaluate "the cost, schedule, and performance criteria of acquisition programs." Finally, the JROC is required by law to provide oversight information to Congress, and thus, like Mr. Christie, is an important avenue for Congress to gain independent insight into these defense programs.

One of the most important functions that the JROC provides is review and approval of the program's Operational Requirements Document, which establishes the performance goals that a system has to meet in order to make it useful to our military.

Was the JROC formally asked to provide written comments on the memorandum that abolished the Operational Requirements Documents, and if so, would you send us those comments?

Secretary ALDRIDGE. Sir, I would like to answer the question. The Chairman of the Joint Chiefs did comment on program management for missile defense. The JROC itself did not. JROC is chaired by the Vice Chairman, sir, of the Joint Chiefs. That is not part of the process by which we are undertaking missile defense. The JROC has a very firm requirements process of determining what is absolutely essential for the military to deploy.

The approach we are taking on missile defense is a capabilities-based approach. General Kadish, as he develops the program in its R&D state, if it is in fact ready for production and deployment, will advise the Senior Executive Council whether that capability is sufficient to proceed.

At that point, when there is a decision to proceed to a production and deployment, it does go into the JROC process. The normal deployment process enters into the regular acquisition system, but not before that time. Prior to that time, the Missile Defense Agency is involved with research and development only to develop a capability that is desired by the country.

Part of what the Missile Defense Support Group does, in fact, is include the Joint Staff as members of that group, and the process by which advice is given both to the Director of MDA, as well as to the Senior Executive Council, goes through the Missile Defense Support Group, which does include not only the Joint Chiefs of Staff but also DOT&E. It also includes the Comptroller and Program Analysis and Evaluation (PA&E). All the agencies of the Department that have an equity in missile defense are included within that support group, which does provide the independent advice.

Chairman LEVIN. Well, I think our top military leaders ought to have a very deep involvement in this assessment. The JROC is required by law to evaluate the cost, schedule, and performance criteria of acquisition programs. I think that there needs to be a much deeper involvement in it, and I think this subcommittee and our full committee is going to work to assure that that in fact happens.

I am wondering, Mr. Christie, if you would tell us whether or not you and your office are acting in ways, relative to the missile defense, differently than your predecessor Mr. Coyle acted. Do you know?

Mr. CHRISTIE. I think in earlier discussions I made the point that a year ago, or last summer after I was confirmed, I discussed our involvement with both of the gentlemen here at the table, as I knew they were totally restructuring the set of programs in this Missile Defense Agency. By mutual agreement, we backed away until all of these programs were properly structured and we would have something to begin to look into. I stated earlier that PAC–3 was not one of those because that program was proceeding into operational testing.

We have worked over the last couple of months to come up with a working arrangement whereby we will be involved in the testing that takes place and the planning for tests, and I am confident that our involvement will, in fact, probably come close to whatever Mr. Coyle was doing before. His office was quite heavily involved, I think, in the technical testing that was going on because most of the evaluations that he was doing were based on technical testing. We will be involved also.

Chairman LEVIN. When do you expect the details of that arrangement would be worked out?

Mr. CHRISTIE. We have pretty well worked them out now.

Chairman LEVIN. Are they in writing?

Mr. CHRISTIE. We have a set of charts that provide that detail. My staff is a member of the Missile Defense Support Group. However, we do not have a memorandum of understanding or anything like that that the two of us have signed.

Chairman LEVIN. You think there are written charts.

Mr. CHRISTIE. Yes, we have charts. Yes.

Chairman LEVIN. Could you submit them to this subcommittee?

Mr. CHRISTIE. I will do so.

[The information referred to follows:]

The information referred to appears in question for the record number 9.

Chairman LEVIN. Thank you so much. Thank you, Mr. Chairman.

Senator REED. Thank you, Chairman Levin.

I would like to finish up a series of questions.

Going back to the discussion of the contingency deployment for the land-based system, General Kadish, if you declared this system contingency deployed, would you be operating the system and running it or would it be transferred to a Service?

General KADISH. That is a great question.

Senator REED. Well, you keep asking questions all afternoon, and you finally get a great one. [Laughter.]

General KADISH. The reason I say that is we are dealing with trying to understand how that operates now. It is clear, at least at this point in time, that any kind of contingency operation of any system that we would have in missile defense needs to be done by operators who are the warfighting experts. However, just as we did, and I hate to go back to other analogies, but as I recall, when we deployed JSTARS during the Persian Gulf War, we still had contractors operating parts of that system because they were not ready for trained airmen to actually operate them. So, I would expect that elements of our contractor and Missile Defense Agency personnel would be involved in the operation, but the actual warfighting decision making is done by the proper chains of command.

Senator REED. Thank you.

Secretary Aldridge, you stated last week that all of the internal oversight organizations of the Pentagon are to be involved in the Missile Defense Support Group. You reaffirmed that today.

But your memorandum of February 13 severely restricts the number of personnel from these organizations to be allowed access to missile defense program information. I understand that the limit is two or three people from each organization, and in any case, your memorandum allows you and General Kadish to personally approve each person to be allowed access. I also understand that prior to this current administration, there were dozens of people who on an as-needed basis had access to the information.

With such limited access, how do you expect the Pentagon's oversight organizations to operate fully, completely, and, indeed, inde-

pendently if in fact you and General Kadish can veto people who might be looking over your shoulders?

Secretary ALDRIDGE. Well, the intent is that the individual offices nominate the people that they want to put on the program, and that nomination is for the senior person which is the Missile Defense Support Group individual. In addition to that individual, we allow two more technical people to participate.

We just did not want hundreds of people who show up at meetings to hear data. We think that 13 organizations that can have 34 people, essentially full-time, working on this problem is probably enough to make sure that all the equities of all the offices are sufficient without it getting out of hand. That was the rationale.

The individuals who are nominated are, in fact, approved by us because we felt that we wanted to make sure people had the experience, that they have an understanding of missile defense, they have the expertise to be valuable, and that offices are not just nominating people because they are trying to get rid of somebody who is not a productive part of their organization. So, we want to have some say-so that the 34 people who were, in fact, involved were capable individual people who could contribute to the job.

Now, once the Working Group members have access to data, what they do with it and how they deal back at their organizations, that is up to them. They can bring in other people to discuss, seek advice, and things of that nature. But we believe that 39 people to provide for the oversight of this organization was sufficient to meet the needs of the Department, meet the needs of the Missile Defense Agency, and meet the needs of the Senior Executive Council, which have to make independent judgments. That was the rationale.

Senator REED. Well, one could raise the question of a lack of confidence in the judgment of people like Mr. Christie to appoint people to this group.

Secretary ALDRIDGE. I think we took Mr. Christie's nominations.

Senator REED. Well, you could have said no.

Secretary ALDRIDGE. Yes, if he would have submitted someone who we believed in our judgment was not going to contribute to this process, yes, sir, we could say no.

Senator REED. But I still think the point remains that you reserve the right to contradict or veto the decisions, including those of the JROC, for example. You essentially take who was sent to you, and that might be for many reasons, some you alluded to, but there might be other reasons.

Secretary ALDRIDGE. It could, based on the reasons I stated, but we did not.

Senator REED. Is there any other program that is managed or run in this way in the Department of Defense?

Secretary ALDRIDGE. The only one that can be identified as closest is probably the National Reconnaissance Office, which deals with systems of systems, and one coming, which will be the Army's Future Combat System. It is going to have similar characteristics of multiple pieces of programs that have to be highly integrated.

Senator REED. Thank you.

Secretary Aldridge, last week we discussed the application of the Nunn-McCurdy Act, which establishes cost control mechanisms for major defense programs. There was some ambiguity about its ap-

plication. In support of the annual reviews of missile defense programs, one of which is scheduled for this fall, what sort of cost control mechanism will be applied and what specific data and documentation will be reviewed to understand whether the programs are on target if not Nunn-McCurdy?

Secretary ALDRIDGE. Yes, sir. I did go back and look at Nunn-McCurdy. It does not apply to R&D programs until you get to a decision point for actual deployment. So, in the R&D effort, Nunn-McCurdy would not apply in this particular case. So, we will have to find other mechanisms to ensure that the programs remain under cost control.

As they are going through R&D, it is very difficult to identify what the end state is going to be, and so it is not until we have a program that can be defined and an end state of the R&D program, and if we are successful, this is when we will actually enter into full-scale engineering development, and this is when we will start production, and then we can lay out a cost of a program and check its milestones. Until we make that full decision, it is very difficult to track program content in the sense of a Nunn-McCurdy certification, but we do track the program in terms of what we expect the R&D to cost and what it is really costing.

We ran into one. It was not a Nunn-McCurdy breach, but it was the SBIRS-Low program in the missile defense program. It was going up in cost at a significant rate, and we decided that this was a program that was unexecutable, and we have asked it to be restructured. So, the process will continue to look at programs in the normal way. It just does not have the Nunn-McCurdy tool, as one of many tools, of monitoring cost, performance, and schedule.

Senator REED. But you will be developing documentation and data to support reviews?

Secretary ALDRIDGE. Yes, sir. There will be a Selected Acquisition Report (SAR) that will be written in that way. As we have done for PAC–3 as it moves out, there will be a separate SAR for each of those programs.

Senator REED. Congress will have access to that data and documentation?

Secretary ALDRIDGE. Yes, sir.

Senator REED. Secretary Aldridge, also in your February 13, memorandum to General Kadish, you requested that he send you, within 60 days, a program implementation plan to address in part the following: program structure with funding allocations; the Ballistic Missile Defense System program baseline; technical and program management structure; acquisition strategy; planned program documentation and reporting to OSD, Services, and Joint Staff interfaces; the approach to test and evaluation; and a transition plan for transfer of programs to Services.

General Kadish, are you on schedule for delivery of that plan?

General KADISH. We are in the process of putting it together right now. Given the complexity of some of the things we are doing, I am a little bit worried about the deadline that Secretary Aldridge has set. But our intent is to fully document, as best we can, and have the Missile Defense Support Group review that plan in some detail, and then we would respond to that advice out of the MDSG. So, we are underway with the implementation plan right now, and

I am hoping that it will be, if not on time, very close to being on time.

Senator REED. When you send it to Secretary Aldridge, may we also see it in Congress?

General KADISH. Yes, sir. I defer on that question to Secretary Aldridge.

Secretary ALDRIDGE. I do not see any reason why you cannot. It should be available to you. Once we go through the process that we all agree to, the Missile Defense Support Group has agreed to it and the SEC agrees this is the plan we are on, I do not see why it should not be available to you immediately.

Senator REED. It might be interesting to see the plan before the MDSG agrees to it. Sometimes the changes are more illustrative than the actual substance.

Secretary ALDRIDGE. We will reserve it for next year's testimony, sir. I will tell you how it turned out. [Laughter.]

Senator REED. Well, or the next hearing.

Secretary ALDRIDGE. Yes, sir, the next hearing.

Senator REED. Let me conclude with a comment as much as a question. We have heard a lot about capabilities-based development. Frankly, I have a list of different descriptions by General Kadish and yourself, Mr. Secretary, of what capabilities-based means. They are not entirely identical.

Secretary ALDRIDGE. Oh, yes, sir, they have to be.

Senator REED. They have to be. [Laughter.]

Do you want me to read them? All right, here we go.

In your testimony, General Kadish, you said it meant "a flexible approach to the acquisition of complex systems, incorporating advanced technologies that permit deployment of a limited but effective capability that can be progressively enhanced." In today's testimony, you mentioned the word "threat," which was not part of the previous exposition, at least to my recollection.

In your testimony, Secretary Aldridge, you said it "would procure missile defenses at the earliest possible date."

Mr. Christie, you said the new approach "is evolving to provide for the successful development of capabilities that are responsive to threats while, at the same time, maintaining essential operational effectiveness for equipment that is fielded."

Page 14 of the Department's Quadrennial Defense Review, defined it as "focusing more on how an adversary might fight than who the adversary might be."

Then Secretary Rumsfeld, in his testimony before the Senate Armed Services Committee last June, said it meant we would "work to select, develop, and sustain a portfolio of U.S. military capabilities to help us prevail against current threats and dissuade potential adversaries from developing dangerous new capabilities."

My sense is that, at least in terms of the expression, there are slightly different views and maybe even significantly different definitions. But when we engage on these questions, the ultimate answer always seems to be, well, we are doing a capabilities-based assessment and it is different and you do not understand because it is capabilities-based.

I am concerned that this is just a new buzz word, new jargon, and there is, I think, a consequence, as you, I think, would admit,

of moving away from the old system. A requirement target was set and you pretty much knew if you measured up to what the requirement was. Here, that requirement is very flexible. It can move around, and I think you would say that you have to do it that way. But it also invites the possibility that you can dumb-down standards. You can deploy things for reasons unrelated to the quality of the system, just because you feel compelled to do it. That, I think, takes away from some of the rigor that we normally see in defense programs.

That is a comment. If you would like to rejoin, I would invite you to do that, but that is my final comment.

Secretary ALDRIDGE. I will try to do this with a short comment. All those statements you read are not inconsistent.

Senator REED. No, but they are not precise, not as precise as saying we are going to build a system.

Secretary ALDRIDGE. Right, but I also notice that in many of the statements, you were mixing up spiral development with capabilities-based development. What we are talking about in terms of capabilities is the future. We may not know who we are going to fight, when we are going to fight, or where we are going to fight. Therefore, we must design a capability that says this is what we want to do in spite of this uncertainty. I think that is one approach.

Once we do define what capability we want, the issue of spiral development now enters the picture, what we want to improve with time, and that is what spiral development does. It allows that initial capability to be improved in time.

They are related but they are in fact separate. I think we have described capabilities, and maybe that is all I should say.

Senator REED. Well, Mr. Secretary, staff has selected descriptions of what was purported to be the capabilities-based approach, not the integration of both.

This leads to a few questions. If you are doing capabilities, there are some very simple measures. One is, what missiles are you going to defend against and in what time frame? When are you going to deploy? Those are the types of answers that ultimately we are going to have to come to. At this point, I have not heard those answers, and we are spending a great deal of money in the process.

Secretary ALDRIDGE. Yes, sir. We have not made those decisions.

Dumbing down the requirements and perhaps doing some things that are less capable than we would like is not the intent of any of this. I am an American. I am a taxpayer and want to make sure that what we get for our country is the very best we can provide at the right cost and schedule and performance. So, the issue of trying to institute a process that is going to allow perhaps less capability than we would otherwise desire is certainly not what we are intending to do here. We are trying to do it faster, quicker, and certainly with the oversight of the Department of Defense, and we always have to come to Congress when it comes to a decision to deploy. We have to get the funding to make that happen.

Senator REED. Thank you, Secretary Aldridge. Mr. Christie, General Kadish, thank you.

The hearing is adjourned.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JACK REED

REQUIRED CONGRESSIONAL INFORMATION

1. Senator REED. Secretary Aldridge, during the hearing you committed to sending Congress such information on missile defense as is required to be submitted for Major Defense Acquisition Programs. This information includes the development schedule, including estimated annual cost until development is completed, the planned procurement schedule, including the best estimate of the Secretary of Defense of the annual cost and units to be produced. Please provide this information for all missile defense programs that were previously Major Defense Acquisition Programs as soon as possible in order to support congressional reviews of the fiscal year 2003 budget request for missile defense.

Secretary ALDRIDGE. The fiscal year 2003 budget estimate documentation together with the Selected Acquisition Report (SAR) provide the most up-to-date information available regarding cost, schedule, and development, including those previously identified as Major Defense Acquisition Programs. Specifically, the estimate provides funding requirements for the next 6 years, by year; schedule, including hardware and software deliveries, to the extent known; and planned decision points and test events for all program activities at least through completion of planned testing and evaluation of the prototype.

Developing a single, integrated missile defense system is a vast technical challenge that will take time and effort to mature. We are working hard toward the important goal set forth for us by the Secretary of defending the United States, deployed forces, allies, and friends by developing a system that layers defenses to intercept a ballistic missile in all phases of flight against all ranges of threats. The system will add capability over time. We will deploy individual elements and components of the system only once their technological maturity and military utility have been clearly demonstrated. Until that time, we will not know how many units should be produced or their cost. We will deploy those components in an architecture that allows our capability to be improved as the technology matures.

We have provided Members and their staffs documentation and briefings on our strategy and our progress. We will continue to provide that information to Congress as we develop the system and the information becomes available.

STATUS OF DOT&E ACCESS TO MISSILE DEFENSE AGENCY PROGRAMS

2. Senator REED. Mr. Christie, during the hearing, Secretary Aldridge agreed with me when he said that "statutorily, Mr. Christie can have access to any data without agreements with anyone else in the Department." Do you, your staff, and your support contractors now have unfettered access to all information you and your staff deem necessary in order for you to perform your oversight responsibilities for Missile Defense Agency (MDA) programs, especially the responsibility you committed to at the hearing of independently assessing the capabilities of the 2004 "contingency deployments" for missile defense?

Mr. CHRISTIE. As of this point in time, DOT&E and our federally-funded research and development contractor (FFRDC) support staff have not gained unfettered access to the MDA programs. The various MDA programs are still undergoing the process of restructuring. In the meantime, we have obtained for review some reports on the Ground-based Midcourse Defense System. Additionally, we have regular access to the Patriot PAC–3 program that is currently in operational test and evaluation being conducted by the Army. We have also had some insight through the Missile Defense Steering Group into the restructure of the SIBRS-Low program. We have been awaiting delivery of the MDA Implementation Plan to ascertain how they propose the OSD staff (including DOT&E) will carry out its oversight of the MDA programs. In the meantime, DOT&E has proposed a T&E implementation plan that spells out the access we need in order to perform our oversight and independent evaluation responsibilities. This proposal includes details on the types and level of access needed by ourselves and our FFRDC support staff in interacting with the MDA, the various program offices, and the system contractors. Our plan identifies the types of information, documents, and meetings we need access to in order to adequately evaluate the MDA programs and prepare our annual assessment reports for the MDA and Congress. This plan has been provided to MDA for comments or acceptance. We anticipate that we will have access to all requisite information and participation in meetings to perform DOT&E's mission.

RESTRICTIONS ON ACCESS

3. Senator REED. Secretary Aldridge, have you rejected any request for a particular individual to be a member of the Missile Defense Support Group (MDSG)? If so, which organization was affected and what was the basis of the rejection?

Secretary ALDRIDGE. I accepted the nominations from the Secretaries of the Services, the Vice Chairmen of the Joint Chiefs of Staff, and the senior members of the other organizations from the Office of the Secretary of Defense for their representatives to the Air Force request for a second seat on the MDSG. Although I have delegated Milestone Decision Authority for Space to the Air Force, I did not feel one Service deserved more representation on the MDSG than any other Service. The Missile Defense Agency has established a board of directors (BOD) with each of the Services, and the Air Force BOD ensures both space and other procurement programs are integrated and addressed.

ACCESS OF SUPPORT STAFF AND CONTRACTORS

4. Senator REED. Secretary Aldridge, you testified that the rules you have established for the MDSG allow at most three people from any given independent oversight organization to participate in the MDSG. Three people is not a sufficient number for substantial independent analysis to be performed by any of these independent organizations. Do your rules, therefore, allow for the independent oversight organizations' staff and contractor support personnel, who are not members of the MDSG, to have access to MDA programmatic information, either via the MDSG process of via other means? If not, how do you expect meaningful independent analyses to be conducted by these organizations?

Secretary ALDRIDGE. The Missile Defense Support Group and associated Working Group comprise a total of 34 individuals. This is an efficient size to allow independent analysis and to conduct dialogue leading to sufficient advice to the Director of the MDA, the Senior Executive Council, and me. Individual members may distribute MDA information as they deem necessary within their own organization to do their job as long as it is controlled according to its security classification (as a minimum For Official Use Only) and is considered pre-decisional, and the individuals have a need to know. If an organization requires additional people to have access directly with MDA to fulfill a specific requirement this is agreed to between the MDA and the individual organization. Each MDSG principal has a corresponding senior level point of contact within the MDA for coordination and interactions on a daily basis.

5. Senator REED. Secretary Aldridge, could you please provide, as soon as possible, the rules of access for non-members of the MDSG?

Secretary ALDRIDGE. The MDSG meetings are closed to non-members to allow open dialogue and efficient operations dealing with pre-decisional information. Non-members are allowed access on an invitational basis controlled by the chairman for specific activities as deemed necessary by the MDSG body as a whole.

OPERATIONAL TESTING FOR 2004 DEPLOYMENTS

6. Senator REED. Mr. Christie, it was established at the hearing that no operational tests were planned for any of the missile defense systems for which there is a potential 2004 "contingency deployment." Although other systems, such as JSTARS and Predator were in fact deployed prior to the completion of operational testing, it is my understanding that these systems did not pre-plan such "contingency deployments." Thus, the pre-planned nature of the proposed missile defense contingency deployments, and the fact that we are budgeting extra funding for them now, makes them unique. Do you believe that preplanning on these contingency deployments for 2004, and buying extra hardware now to support such a deployment, is a prudent action without plans for any operational tests prior to the deployments and if not, why not?

Mr. CHRISTIE. Historically, acquisition programs have not pre-planned contingency deployments. JSTARS and Predator are two recent examples of programs among many others over the years that were taken out of an ongoing development and test and evaluation program to support an urgent operational need. However, planning for an early contingency deployment should not be any different from planning for an initial block capability. Plans for developing and acquiring systems that address an imminent or volatile threat, where contingency deployment is likely, should include a strategy that builds basic operational utility testing into the engineering and development process. This is precisely what capabilities-based acquisi-

tion is supposed to accomplish, by involving all stakeholders early in the design process and sharing information about the eventual required capability. Under this approach, we could deploy at any time in any design increment and be assured that our confidence in operational capability, while not complete, is balanced with respect to our confidence in other critical design factors. Our goal is to assist the MDA in developing a strategy that builds basic military utility assessments into the engineering, development, and testing processes for each of their programs. This will allow DOT&E to provide the best possible assessment of capability and provide higher confidence in the 2004 contingency system. While not as rigorous as a full operational test and evaluation plan, this strategy balances confidence in operational effectiveness against the risk posed by an emerging and evolving threat.

7. Senator REED. Mr. Christie, if so, why should other, less complex defense programs not also begin to plan, and budget for, such contingency deployments with no prior operational testing and what should the criteria for pre-planning such contingency deployments be?

Mr. CHRISTIE. In general, all systems should employ a strategy where operational test requirements, along with other requirements for training, logistics, tactics, etc., are developed early on, such that an intermediate decision to deploy could be made at any time. For most military systems with a moderate level of complexity, this is a prudent approach. The more complex a system is, the higher the risks of using this approach in lieu of adequate operational testing. There is an important distinction between emergency deployment and planned contingency deployment. Planned contingency deployments reflect deliberate efforts to exploit capabilities that are demonstrated during early system development. This includes the development of associated operational concepts and tactics. An emergency deployment is characterized by very rapid configuration of a system to address a specific need with little planning, confirmation of capability, or tactics development.

BALLISTIC MISSILE DEFENSE GOALS AND ANNUAL PLAN

8. Senator REED. General Kadish, the preamble to your fiscal year 2003 budget estimate documentation states that the "program goals and detailed test and expenditure plans" required by the National Defense Authorization Act for Fiscal Year 2002 are contained in the documentation. However, the documentation provides detailed information only for fiscal year 2003, and virtually no information on longer-term program goals. To assist in congressional review of the fiscal year 2003 missile defense budget proposal, could you please provide the missile defense goals and program plans as soon as possible?

General KADISH. The fiscal year 2003 budget estimate does provide information on long-term program goals. Specifically, the estimate provides funding requirements for the next 6 years, by year. It also provides schedule, including hardware and software deliveries, to the extent known, and planned decision points and test events for all program activities at least through completion of the planned element or component testing.

Our overarching goal is to defend the United States, deployed forces, allies, and friends by developing a system that layers defenses to intercept a missile in all phases of flight against all ranges of threats. The system will evolve over time. We will deploy elements or individual components of the system when their technological maturity and military utility are clearly demonstrated. Additionally, we will deploy those components in an architecture that allows our capability to be improved as the technology matures.

We have provided members and their staffs documentation and briefings on our strategy and our progress. We will continue to provide that information as we develop the system.

WRITTEN INFORMATION ON OVERSIGHT PROCESS

9. Senator REED. Secretary Aldridge, during the hearing, Mr. Christie said that he would submit the charts that document the arrangement that has been worked out for how DOT&E will be involved in missile defense test planning. Could you please provide, as soon as possible, any documents or charts presented to the MDSG which deal with how MDA programs will be overseen?

Secretary ALDRIDGE. The following charts were developed and approved by DOT&E and presented to both the MDSG and the MDSG Working Group once they were formed. They were also presented to members of congressional staff prior to my signing the February 13, 2002, Implementation Guidance. Currently DOT&E

and MDA are working the specifics of the MDA implementation plan concerning DOT&E planning, oversight, and responsibilities.

SECDEF MEMORANDUM REGARDING TESTING, JANUARY 2, 2002

"The MDA is responsible for Developmental Testing & Evaluation (DT&E) of the BMDS and its elements. When a decision is made to transition a Block configuration of an element to a Service for Procurement and Operation, an Operational Test Agent will be designated and an Operational Test & Evaluation (OT&E) will be conducted at the end of the transition phase to characterize the operational effectiveness and suitability of that Block configuration of that element."

APPROACH TO TESTING – DEVELOPMENT PHASE

- System-level testing of the BMDS will be resourced and conducted under the direction of D, MDA and managed by MDA/TE
- Development testing of the BMDS elements will be conducted by the element program office with oversight by MDA/TE
  - A development Test & Evaluation Master Plan (TEMP) will be prepared and approved by MDA
  - Planning, execution, and reporting standards will be established and adhered to
- In anticipation of an eventual decision to transition a Block configuration of an element, MDA will be responsible for taking prudent steps to
  - Facilitate operational effectiveness and suitability
  - Prepare for later operational testing (OT)
  - Ensure compliance with statutory Live Fire Test & Evaluation (LFT&E)
- DOT&E, as a MDSG member, will advise the D, MDA and the SEC on all issues related to OT and LFT&E
  - Designated DOT&E staff members will have access, coordinated with the MDA, to program element documentation, reviews, technical interchange meetings, testing events, etc.,
  - DOT&E will annually assess and report the adequacy and sufficiency of the MDA test program during the preceding fiscal year.

APPROACH TO TESTING – TRANSITION PHASE (Prep for MS C)

- An operational test agent will be designated to conduct a focused operational test of the Block configuration of the element being considered for transition
  - OT will characterize operational effectiveness and suitability as input to the transfer and procurement decision process
  - No technical capabilities will be tested beyond those demonstrated in development test
- Element program office and OT agent will develop a TEMP with emphasis on the Operational Test (Part IV)
  - Approved by MDA and DOT&E
- DOT&E will oversee OT&E planning, execution, and data analyses and provide an independent characterization of operational effectiveness and suitability to the MDA, Secretary and Congress, as required
- DOT&E will annually assess and report the adequacy and sufficiency of the MDA test program during the preceding fiscal year.
- All Title 10 statutory OT&E and LFT&E requirements will be met for the element Block configuration

DOCUMENTATION ON R&D COSTS

10. Senator REED. Secretary Aldridge, during the hearing you stated that the Department would "track [missile defense programs] in terms of what we expect the R&D to cost and what it's really costing." Furthermore, you committed to providing this data to Congress. Could you please provide the current estimated costs and original costs for: (1) the following prototype items; and (2) the research and development costs associated with development of the prototype items: Airborne Laser prototype; each SBIRS-Low prototype satellite; THAAD prototype; Sea-based Midcourse prototype; and the Space-Based Laser prototype? Furthermore, could you please provide this information as soon as possible to support congressional review of the fiscal year 2003 missile defense budget?

Secretary ALDRIDGE. Prototypes are interim engineering units, which by their nature, do not have firm "production unit" baselines. Technical specifications, purpose, and fidelity of a prototype are continually adjusted to match the development need. As a result, prototypes are unique to both individual programs and to the stage of that program's development. Prototype costs cannot be measured like production units, their costs are embedded in the element and program development costs. Those costs are estimated in the fiscal year 2003 budget request.

DOCUMENTS USED FOR MANAGEMENT

11. Senator REED. General Kadish, given that Operational Requirements Documents (ORDs) have been abolished, as well as program baselines and production unit cost estimates, it is unclear what documentation you are currently using to manage your programs. Could you please provide, as soon as possible, a list of the documents you are currently using to monitor and manage MDA programs, and a description of what each document contains?

General KADISH. ORDs have been canceled only for missile defense elements in development, not for those ready to be transferred to the Services. Capability-based ORDs will become operative upon transfer of capabilities to the Services.

Under the Department's traditional acquisition process, development started with specific military requirements generated by the user. These requirements were formalized in the ORD. Following the ORD, Key Performance Parameters (KPP) were

established and used to define contract requirements and deliverables. Contract performance was reported using the Earned Value Management System (EVMS). Department and congressional oversight was afforded through the Defense Acquisition Executive Summary (DAES) and the SAR, respectively.

For MDA, the strengths of the traditional requirements generation process were also its weaknesses. It is rigorous, but that very rigor translated into a lack of the flexibility needed in missile defense development to deal with unprecedented technology development, uncertain threats, and complex multi-system integration. Requirements defined in ORDs are typically set years before actual system deployment, and can lead to less than optimum capability against a threat that exceeds that description. Furthermore, we do not yet know all the technical approaches that will work best.

MDA's capability-based strategy implements acquisition discipline during development from a top-down perspective. This top-down approach promotes optimal system performance, maintains developmental flexibility, and ensures a high-level system integration. MDA's system engineering process begins with the development of System-wide Technical Objectives and Goals (TOG) to communicate expectations for evolving BMDS capabilities. This document will provide metrics for comparing alternatives and high-level strategy for development. Because specific threat identification, as previously captured in the System Threat Assessment Report, is no longer possible, the Adversary Capability Document (ACD) provides the range of capabilities a potential adversary might be able to deploy. Subsequently, more detailed System Capability Specifications (SCS) will provide capability requirements for the overall system, elements, components, and interfaces. The TOG and SCS will help define the overall system configuration and architecture.

From the TOG and SCS, MDA will develop capability specifications for individual elements and components. These two documents are respectively known as the ECS and the CCS. Capability specifications will include hardware and software descriptions as well as interface design requirements. These detailed specifications will be reflected in traditional cost, schedule, and performance metrics used to define contract requirements and deliverables. Contract performance will still be managed using the traditional Earned Value Management System (EVMS) practices. Traditional 'control' documents such as Risk Management Plans and Cost Analysis Requirements Descriptions (CARDs) remain in use for each individual program element. Congressional oversight will still be afforded through the SAR. In place of the Defense Acquisition Executive Summary (DAES) report, we submit an MDA Quarterly Report that contains an overall BMDS status and assessment for use by the Missile Defense Support Group. We are also developing a BMDS Integrated Master Schedule (IMS) for internal use. The IMS will capture key schedule information from the element programs and certain MDA business and functional processes for use in preparing a BMDS-level schedule assessment that will be included in the MDA Quarterly Report.

In sum, the key documents MDA uses to management development are: the TOG, ACD, SCS, ECS, and CCS, in addition to the MDA Quarterly Report and SAR. At the execution level there is no change between requirements-based and capability-based acquisition approaches. Using capability-based acquisition, baselines will still be in place to determine if programs are running on cost and on schedule. Reporting requirements will still be available to judge the trade off of additional developmental risk for additional performance or additional cost. The Department will still be able to determine if a missile defense program should be accelerated, decelerated, modified, or terminated. After a program completes the development phase and moves into the transition phase prior to procurement, the military Services will prepare the normal acquisition documentation.

PAC–3 TRANSITION

12. Senator REED. General Kadish, the PAC–3 system has been transitioned to the Army for procurement. Is the system meeting its threshold ORD performance and if not, why not?

General KADISH. The Secretary of Defense has canceled missile defense ORDs, including the PAC–3 ORD, thereby removing the former threshold ORD performance parameters as go/no-go criteria for the purpose of electing to produce and field missile defense systems. This provides greater flexibility for the application of military judgment in delivering capability to the field. Our testing to date indicates PAC–3 is meeting almost all of the former threshold ORD performance requirements. Rather than delay fielding this critical warfighter capability, we have opted to proceed with limited procurement supported by a disciplined program to continue en-

hancing system performance against existing and emerging threats. Once the PAC–3 system completes operational testing we will be positioned to evaluate, along with the warfighter, the level of performance this system provides and whether to proceed with a full-rate production decision.

13. Senator REED. General Kadish, is a new ORD being developed for PAC–3, and if so, by whom?

General KADISH. The Army Combat Developer, the U.S. Army Air Defense Artillery School (USAADASCH) is presently recasting the existing PAC–3 ORD into a capability-based ORD.

14. Senator REED. General Kadish, who is in charge of approval of any new PAC–3 ORD, and who will have to concur with it?

General KADISH. The JROC is responsible for approving the capability-based ORD. MDA will cooperate in developing the document and will provide concurrence before it is submitted for formal review and approval by the JROC.

ARROW SYSTEM TESTING

15. Senator REED. Mr. Christie, the test program for the Arrow system was a subject of discussion during the hearing. What is your assessment of the Arrow test program?

Mr. CHRISTIE. Since Arrow is not designated a Major Defense Acquisition Program, DOT&E has not had visibility into the program to date. As directed in the fiscal year 2002 appropriations language, we plan to review Arrow program plans, reports, and test activities and to provide our assessment of the program in this year's annual report.

ORD RESTRICTIONS

16. Senator REED. Secretary Aldridge, one reason given for abolishing missile defense ORDs is that they are "too restrictive." Can you provide some examples of defense programs that have not been fielded because their ORDs were too restrictive?

Secretary ALDRIDGE. We know of no system that has not been fielded.

CAPABILITY TO DO POST-ENGAGEMENT ASSESSMENTS

17. Senator REED. General Kadish, you stated at the hearing that one of the benefits of deploying a contingency operational capability is that we will learn more than we would have in a "very sterile test program." However, one of the areas test programs focus on is data gathering—usually much more so than deployed programs. What information will not be available in the contingency deployment that would be available during an operational test, e.g., do you plan on actually flying missiles against targets as part of any of the contingency deployments or do you plan on embedding test instrumentation into the contingency deployments to get data for post-engagement assessment?

General KADISH. Operational testing is typically of short duration and, while it is designed to be as realistic as possible, it does not substitute for the knowledge gained about using the system after it is deployed. Deployment provides opportunities to see how hardware and software work in many different situations that could not be fully explored during limited operational testing. For example, integration of battle management command and control with the existing command structure can be much more thoroughly demonstrated, particularly with the built-in test capability that the BMDS will have. Even if a contingent operational capability is deployed, MDA's capability-based acquisition program will continue to evolve the BMDS through spiral development to a more capable system. In support of this ongoing RDT&E program, a full spectrum of testing and data collection will continue, particularly focusing on target intercepts and post-intercept analysis. However, we have yet to fully define the details on what data will be collected from a BMDS that is contingently deployed and what data will be collected during the concurrent RDT&E program. They will depend in part on the BMDS Block capability that is deployed. In any event, contingency deployment, if it occurs, is expected to supplement and not eliminate test information collected on BMDS capabilities.

CONSULTATION OF SERVICE CHIEFS

18. Senator REED. Secretary Aldridge, during the hearing you stated that you did not know why the Service Chiefs were not consulted on the missile defense budget, and you did not explain why the JROC was not consulted on the memorandum that abolished ORDs for missile defense. Could you please now answer these questions, and indicate if you plan in the future to obtain the opinions of these groups regarding missile defense programs and if you do plan to obtain the opinions of the Service Chiefs and the JR0C in the future, could you please explain the process by which this will be accomplished?

Secretary ALDRIDGE. Both the Secretary of Defense January 2, 2002, Directive and my February 13, 2002, Implementation Guidance Memorandum were coordinated with the Service Secretaries and the Vice Chairman of the Joint Chiefs of Staff prior to signature. Since that time these organizations have been represented by their nominated principals on the Missile Defense Support Group (MDSG). This group will be used to provide advice to the Director, Missile Defense Agency, me, and the Senior Executive Council that is composed of the Service Secretaries, me, and the Deputy Secretary of Defense. In the course of its work, the MDSG will review the missile defense budget and other priority issues. The Director of the MDA will obtain the advice of the warfigther community on desired operational features and approaches to system deployment. The Joint Theater Air and Missile Defense Organization (JTAMDO) will serve as the voice for the combatant commanders and Services to lead the collaborative effort with the combatant commanders and Services on operational matters. JTAMDO will also develop operational concepts, develop the operational architecture, and assess military utility, during Ballistic Missile Defense System (BMDS) development and transition. Further, MDA will work closely with JTAMDO in developing the joint command and control architecture for the BMDS and integrating it into the applicable joint command and control architectures for missile defense. Further, the Director of the MDA has created a board of directors with each of the three Military Services to facilitate interaction and solicit advice to ensure that system development activities are closely coordinated with the needs of the warfighter.

QUESTIONS SUBMITTED BY SENATOR DANIEL K. AKAKA

SYSTEM THREAT ASSESSMENT REPORTS AND ADVERSARY CAPABILITIES DOCUMENTS

19. Senator AKAKA. Secretary Aldridge, according to Secretary Rumsfeld's memorandum dated January 2, 2002, the MDA will no longer rely upon System Threat Assessment Reports developed by the Defense Department's intelligence agencies, but will develop a unique document called an Adversary Capabilities Document (ACD). Are there specific reasons why the Department's intelligence agencies cannot prepare the ACD, and will the ACD be coordinated with the Department's intelligence agencies?

Secretary ALDRIDGE. The intelligence agencies are chartered to provide intelligence data and assessments that are based on data that are collected, processed, and analyzed from a variety of intelligence collection assets. These data are evidence-based. The ACD is not limited by evidence-based capabilities and assessments. It will be based on the limits of technological capabilities and physics, not simply the limits of intelligence-projected capabilities. A task such as the ACD is outside mission statements and charters for the intelligence agencies, as currently defined

However, intelligence data is also included in the ACD. For each parameter in the ACD, intelligence data is always the inner bound or starting point in determining the theoretical minimum and maximum value. Every effort is being made to coordinate the development of the ACD with the intelligence agencies. The Missile and Space Intelligence Center, the National Air Intelligence Center, and the Defense Intelligence Agency have been represented at every review meeting thus far. Their participation is critical to the success of the ACD.

20. Senator AKAKA. Secretary Aldridge, General Kadish said in his testimony that the ACD will be "physics-based and look at the physical parameters that could be around the threat." Could you detail which physics-based parameters will now be included in the ACD and if that information will require detailed knowledge of an adversary's missile and warhead configuration?

Secretary ALDRIDGE. The set of parameters emphasizes what is possible to observe directly, starting from DIA missile modeling parameters. Parameters derived or inferred from these, and missile technology and warhead data, are included as

warranted. While specific instances of adversary information are useful as examples, or as the first step in locating certain parameter boundaries, detailed knowledge about adversary missiles and warheads is not required and is not the focus of the ACD. Additional detail will require a classified setting.

JANUARY 2, 2002 MISSILE DEFENSE AGENCY MEMORANDUM

21. Senator AKAKA. Secretary Aldridge, in a memorandum dated January 2, 2002, Secretary Rumsfeld directed the MDA to create an acquisition process separate from the Defense Department's traditional acquisition process. Does the MDA intend to seek legislative relief to accomplish the goals and direction of the Secretary of Defense and with this phased approach to deployment, is there a risk that too many programs will enter the pipeline driving up the need for resources downstream beyond what can be expected to be available?

Secretary ALDRIDGE. The Missile Defense Agency and the Department of Defense see no need to seek legislative relief to accomplish the goals and direction of the Secretary of Defense concerning missile defense. The Senior Executive Council will continuously review the missile defense program, and revise it to ensure that risk is managed within appropriate resources.

22. Senator AKAKA. Secretary Aldridge, in the January 2, 2002 memorandum, the Secretary directed the MDA's Director to use transactions other than contracts, grants, and cooperative agreements to carry out basic, applied, and advanced research. You indicate that at least some contracts, such as those being awarded to establish "National Industry Teams," will be awarded outside of the authority of the Federal Acquisition Regulation. If so, doesn't this remove a significant amount of oversight over contracts worth billions of dollars, and could you provide a list and the amounts of contracts which to date have been or to which there is an intent to award outside the authority of the Federal Acquisition Regulations?

Secretary ALDRIDGE. There are two types of other transaction authorities under 10 U.S.C. 2371. One type is to carry out basic, applied, or advanced research and the other, known as Section 845, is to carry out prototype projects directly relevant to weapons or weapon systems proposed to be acquired or developed by the DOD.

The authority to use "other transactions" (OTs) in accordance with Section 845 was delegated to the Directors of all the Defense Agencies in December 1996, providing the authority to enter into transactions (other than contracts) under prototype projects.

The Secretary of Defense memorandum dated January 2, 2002, encouraged "flexible acquisition practices," and delegated to the Director of the MDA, "authority to use transactions other than contracts, grants, and cooperative agreements to carry out basic, applied, and advanced research."

To date, only two OTs have been awarded by the Missile Defense Agency, both using the Section 845 prototype authority. HQ0006–02–9–0001 was awarded in the amount of $23 million to the Boeing Corporation as the lead of the Missile Defense National Team (MDNTS(I)) for Systems Engineering and Integration; and HQ0006–02–9–0002 was awarded in the amount of $23 million to Lockheed Martin Corporation as the lead of the Missile Defense National Team (MDNTB(I)) for Battle Management, Command, Control, and Communications. The period of performance for both OTs is through June 2002; however, it is anticipated that they will both be extended to December 2003, with an estimated increase in total value to $141 million and $141 million respectively. It is also anticipated that 2-year increments for the block evolution of the BMDS may continue through December 2011 for a total potential value of $950 million per OT.

In order to ensure that adequate oversight was provided for in these agreements, the OTs were awarded using the guidance provided by the DOD Other Transaction Guide dated December 2, 2001. The MDA OTs include an oversight provision titled "Comptroller General Access" which provides the Comptroller access to the contractors records Other oversight, which is similar to FAR contracts, comes through OT Annual reporting to Congress, Defense Contract Audit Agency review of invoices and allowable costs, and Defense Contract Management Agency Administration and review of accounting systems.

23. Senator AKAKA. Secretary Aldridge, in the January 2, 2002 memorandum, the Secretary stated that he would decide, with input from a Senior Executive Council, to use test assets for emergency or contingent capability. The test assets referred to in the memo are scheduled to be available in a little more than 2.5 years. What

criteria will the Secretary use to determine if a test asset should be used as a contingent or emergency capability?

Secretary ALDRIDGE. Neither the Secretary of Defense nor the Senior Executive Council have established specific criteria at this time for determining if test assets can be used as a contingency capability. It will be a case-by-case decision based on operational needs, ballistic missile defense element capabilities, test results, and other criteria deemed appropriate at the time of the decision.

OPERATIONAL TESTING AND CONTINGENCY AND EMERGENCY CAPABILITIES

24. Senator AKAKA. Mr. Christie, if test assets are not operationally tested before they are determined to be available as a contingency or emergency capability, how can the Secretary be sure that the assets will work in an operational environment?

Mr. CHRISTIE. As I stated in a previous response, I recommend that operational utility be addressed throughout development, so that capabilities may be deployed at any time without a disproportionate risk of operational difficulties. Under this approach, interim concepts of operation would be developed which account for the current state of system development. Putting together an operational capability and concepts of operations using components that are at various stages of maturity is risky. Previously, I pointed out the distinction we see between contingency deployments and emergency deployments. We believe that the philosophy we have described will balance the risk of either eventuality. By definition, an operational testing program, supporting a full-rate production decision or Initial Operational Capability, should employ production representative hardware. However, since such hardware is generally not available during development, interim deployments will exploit hardware built for testing. This strategy will put low-rate initial production equipment into service and may require a higher degree of interoperability or different interfaces than the final system concept, as required inputs from immature elements may have to be provided by a combination of other systems. The Secretary will have to weigh the relative risks of deploying an immature system against the risk posed by the given emergency. Addressing operational issues early and continuously in the development process will provide the best possible information to support decisions for contingency deployment.

MISSILE DEFENSE AGENCY AND FISCAL YEAR 2003 OMB ASSESSMENTS

25. Senator AKAKA. Secretary Aldridge, in the President's fiscal year 2003 budget, the administration presented the results from its ongoing review of programs throughout government to identify strong and weak performers. Often, the budget request sought to redirect funds from lesser performing programs—or programs with unknown performance—to higher priority or more effective programs. How did MDA's programs rank in the OMB assessment?

Secretary ALDRIDGE. OMB did not publish a rating of the Missile Defense Agency programs in the fiscal year 2003 President's budget.

MATURE TECHNOLOGIES AND CAPABILITIES-BASED ASSESSMENTS

26. Senator AKAKA. Secretary Aldridge, my understanding of your "capabilities-based" methodology is that once you have considered all mature technologies that can be used in a missile defense system, you will determine the military application of each capability. Have you completed a survey of all mature technologies to determine what capabilities exist and how do you define a mature technology?

Secretary ALDRIDGE. MDA continuously monitors and assesses technology developments to identify new and maturing opportunities that could materially improve the capability of the BMDS. This is not a one-time or episodic process.

MDA is in the process of refining a technology maturity evaluation process for the BMDS program. This process is being patterned after NASA's Technology Readiness Levels (TRL) and the DOD 5000.2–R acquisition regulation.

DIRECTOR OF OPERATIONAL TESTING AND EVALUATION ROLE

27. Senator AKAKA. Mr. Christie, the administration has given the Director of Operational Testing and Evaluation a role in determining whether or not missile defense programs are functioning properly with the major industry contractors involved in developing the program. In addition, the Secretary proposes establishing "National Industry Teams" through transactions other than contracts, grants, and

cooperative agreements to carry out basic, applied, and advanced research. If these transactions are outside of the authority of the Federal Acquisition Regulation, what oversight will anyone have over the contractors?

Mr. CHRISTIE. We have not had access to details on the roles and responsibilities of the "National Industry Teams," and, thus, are unable to address this question explicitly. If the intent of the teams is to perform basic, applied, and advanced research, then the Services' R&D laboratories or national FFRDCs are the right organizations to provide oversight. Even if these efforts were funded by traditional contracts, DOT&E does not have adequate resources to evaluate the delivery of research products unless they are incorporated into a system concept with mission requirements and measurable performance characteristics.

28. Senator AKAKA. Mr. Christie, the Secretary's January 2, 2002, memorandum directs the Under Secretary of Defense, Acquisition, Technology, and Logistics, to base production decisions on initial performance demonstrated through credible testing, availability of system alternatives, and threat evolution. Secretary Aldridge stated that the initial performance decision on which production decisions would be based would come during the developmental testing phase. If that is the case, then by definition some initial deployment decisions would be made during the developmental testing phase. In that situation, why aren't you involved at an earlier stage in order to ensure operational decisions are consonant with performance capabilities and if you are not involved, then would deployment decisions be made based on the developmental testing phase with no assessment by you of the adequacy of the performance criteria in meeting the capabilities based design?

Mr. CHRISTIE. Production decisions have historically been tied to demonstrations of operational effectiveness and suitability through operational test and evaluation. Under the MDA acquisition strategy, they will perform "credible testing" in order to access an element's capability prior to recommending a production decision. DOT&E will have insight into this "credible testing" through my participation on the Missile Defense Support Group. Through this forum, I will offer my advice to the Director of the MDA and to the Senior Executive Council as to what testing should be performed and whether the testing performed adequately demonstrates operational capability consonant with the maturity of the element and the magnitude of the production or deployment decision.

PROGRAM STOPPAGE CRITERIA

29. Secretary AKAKA. General Kadish, in his January 2, 2002 memorandum, Secretary Rumsfeld directed the Under Secretary of Defense, Acquisition, Technology, and Logistics, to plan and execute work such that it may be truncated or stopped under certain circumstances. Under the capability-based model, when will the criteria for continuing or stopping a program be established—before development begins, prior to testing, or after completion of testing?

General KADISH. Under our capability-based approach, we do not plan to pre-determine specific criteria for continuing or stopping a program. Instead, we will establish metrics by which we will measure each element's or concept development's progress. We will use those metrics, covering cost, schedule, and progress versus risk, as part of our on-going assessment process for the entire BMDS.

Our recommendation to continue, accelerate, modify, or stop a particular element or concept will consider those metrics, but will also consider changes to an adversary's potential capability, as well as changes in policy, operational considerations, and affordability considerations. We will bring our assessment and recommendations to the SEC at least annually for their review and approval.

TECHNOLOGY READINESS LEVELS

30. Senator AKAKA. General Kadish, the MDA is currently doing a technology readiness level assessment of all system elements of critical technologies. Standard practice is to not enter into an acquisition program for a system until it reaches Technology Readiness level (TRL) 7. Generally, system requirements are used in determining the level of maturity of the system. How are you determining the TRLs for missile defense if operation requirements have been canceled?

General KADISH. MDA continues to use the DOD approved definitions of TRLs. MDA is establishing a detailed checklist to move elements/components and new technologies from one TRL to the next that focuses on whether specific engineering and production milestones have been achieved during development in lieu of operational requirements. For example, a checklist to determine whether the develop-

ment of a technology has reached TRL 3 could include assessment categories such as "Integration and production issues have begun to be addressed" and "Components of technology have been identified and have been partially characterized."

31. Senator AKAKA. General Kadish, how is the MDA assessing the readiness level of the different software components critical to missile defense systems? Will MDA's assessment of technical readiness levels include as assessment of how well the multiple systems work together? How will you address integration concerns?

General KADISH. MDA assesses software readiness based on progressive tests conducted throughout the development cycle. This testing is conducted throughout development at the element and integrated system level. Thus, MDA's assessment of technology readiness levels includes assessments of how well the multiple systems work together. MDA's approach to addressing integration concerns is to test top-level system performance starting as early as possible with software algorithm benchmark and constructive simulations, then proceeding through Hardware-in-the-Loop, System Integration Tests, and Integrated Flight Tests.

32. Senator AKAKA. General Kadish, one of the significant differences between TRL 7 and TRL 8 is that the latter uses an operational environment for testing rather than a relevant environment that might involve proxies and idealized conditions. How will you be able to specify an "operational environment" if you have not committed to an architecture, quantities, fielding requirements, or some expectation of how the system must operate?

General KADISH. MDA does plan to demonstrate specific sets of system capabilities, defined as blocks. Each block configuration of the BMD System consists of a number of elements with a range of system capabilities, architectures, and operational concepts to guide testing of the system capability. These architectures and operational concepts will evolve over time and are developed with input from the CINCs and Services. As the BMDS evolves and these blocks are defined, appropriate operational environments will be developed and instituted within the BMD Test Bed, against which each block capability can be demonstrated. Tests will consider the operational environment appropriate to each block at the time of testing. Full operational testing of the element or component capabilities will be conducted prior to transferal to a Service for procurement.

LOW-EARTH ORBIT SATELLITES

33. Senator AKAKA. General Kadish, a successful missile intercept by an NMD exo-atmospheric kill vehicle could result in the detonation of the nuclear charge due to salvage fusing. A low-yield (10–20 kiloton), high altitude (125–500 km) nuclear explosion could disable—in weeks or months—all low-earth orbit (LEO) satellites not specifically hardened to withstand radiation generated by that explosion. Is your office working with NASA, Intelsat, NRO, and the satellite industry to ensure LEO satellites and the international space station would not be affected by a possible nuclear explosion resulting from a mid-course interception?

General KADISH. MDA has met with many organizations, to include those mentioned, to discuss the potential effects of exo-atmospheric intercepts of ballistic missiles. One of the benefits of a layered missile defense system is the potential to intercept ballistic missiles in the boost phase, so that the scenario described could be avoided altogether.

FUTURE CAPABILITIES

34. Senator AKAKA. General Kadish, have you done any preliminary engineering studies for the various capabilities you are trying to develop, e.g., have you calculated the minimum speed required for an ICBM defense interceptor for boost, mid-course, or terminal phase, and have you applied these minimum requirements to the systems that you are attempting to expand from theater defense to ICBM?

General KADISH. The Missile Defense Agency has conducted engineering studies and architectural trade studies for many years. These studies have been instrumental in providing an understanding of the major element and component parameters affecting overall system performance. Commensurate with a capability-based acquisition approach to the BMDS, the MDA will use these results to guide the pursuit and selection of concepts, technologies, and solutions to the missile defense problem as soon as they become mature enough and provide a sufficiently useful military capability to include in the evolving system. Existing capabilities for missile defense

will be adapted and integrated for their inherent capabilities against ballistic missiles of all ranges.

35. Senator AKAKA. General Kadish, how much of the theater defense system will have to be redesigned to meet the new requirement?

General KADISH. None of our existing systems must be redesigned. We will assess the capability of each element and component to contribute to the overall missile defense mission, and accelerate, truncate, modify, or initiate efforts to improve our mission capability over time based on the maturity and availability of technology to support that evolution. This is the basis of the capability-based acquisition approach we are applying to missile defense.

FUTURE TESTING

36. Senator AKAKA. General Kadish, you have stated that you plan to be able to deploy an emergency system in 2004. According to the current testing matrix, how many integrated flight tests should be completed by then and will any of these tests be in an operational environment?

General KADISH. We are planning to complete four integrated flight tests of the GMD element per year. All testing will develop and demonstrate inherent operational capability at increasingly higher levels of performance. The location and layout of the BMDS Test Bed has been selected in order to simulate as closely as we can an operational configuration of sensors, weapons, and BMC3. To the extent that the operational environment can be defined today, the MDA is designing and using the BMDS Test Bed to represent it and demonstrate system capabilities.

37. Senator AKAKA. General Kadish, how realistic will the testing conditions, support systems (radars), target cluster, etc., be by then?

General KADISH. The development of BMDS will proceed on a step-by-step basis, rigorously demonstrating system capabilities through increasingly more realistic testing against a widening variety of threats displayed in a variety of relevant operational environments. The realism of testing conditions at the BMDS Test Bed for a particular stage of block development will pace the evolutionary spiral development of the BMDS. As the threat evolves, testing and the necessary test infrastructure will be adapted to reflect the need to demonstrate capability over a wider threat space. In the end, realism would be a factor in the assessment of whether or not an emergency system should be deployed. Deployment will depend on specific threats and available resources.

QUESTIONS SUBMITTED BY SENATOR WAYNE ALLARD

SBIRS-LOW

38. Senator ALLARD. Secretary Aldridge and General Kadish, both of you indicated your belief that SBIRS-Low will be a critical component of a missile defense system. At the same time, critics continue to question the need for SBIRS-Low and its capabilities. Is there a continuing need for the capabilities provided by SBIRS-Low?

Secretary ALDRIDGE. Yes, there is still a critical need for SBIRS-Low in the BMDS. Specifically, SBIRS-Low is being designed to:

- provide 24/7 global coverage, and bridge gaps in ground-based sensor systems
- assure midcourse tracking
- discriminate warheads from countermeasures by mitigating the effectiveness of radio frequency (RF) and high traffic countermeasures that negate or seriously challenge radar sensors
- mitigate risk to forward-deployed assets
  - overcomes political sensitivity with regard to basing rights
  - is less vulnerable to attack
- provide vital midcourse signature data to support all ballistic missile defense sensors and interceptors.

General KADISH. Yes, there is a continuing need for the capability provided by SBIRS-Low. SBIRS-Low is intended to provide the BMDS with global, continuous (24/7) surveillance and infrared midcourse tracking of ballistic missiles. Currently, no other system exists or is planned that can ensure this kind of seamless coverage and tracking.

SBIRS-Low's ability to detect, track, and discriminate lethal targets and associated objects in the infrared spectrum complements radar performance and protects

the BMDS against the effects of radar countermeasures. Using its ability to perform these functions over the radar's horizon SBIRS-Low extends the BMDS battlespace by providing early precision cues to radar and interceptors prior to launch. SBIRS-Low continues its critical functions, by providing target information to the in-flight interceptor and assessing the success of the engagement.

39. Senator ALLARD. Secretary Aldridge and General Kadish, why is the capability provided by SBIRS-Low important?

Secretary ALDRIDGE. SBIRS-Low is critical to an effective missile defense because it is space-based, infrared, and in low earth orbit:

- Because it is *space-based,* SBIRS-Low can continuously monitor all of the earth's surface. This means there will be no blind spots or safe havens from which missiles can be launched without the U.S. detecting them. Earlier tracking allows earlier interceptor commitment and an increased opportunity for multiple engagements. A SBIRS-Low could provide key threat development information from inland test ranges which are currently inaccessible. It also provides the capability to track missiles along their entire trajectory from launch to intercept or reentry regardless of launch point or missile trajectory. No other BMDS sensor provides this capability. The extended viewing times make precise tracking and discrimination techniques possible based on long-term observations such as heating or cooling trends.
- Because it employs *infrared sensors,* SBIRS-Low adds robustness to the BMDS, complementing radar systems in several ways. Compared with radars, infrared sensors can more effectively provide wide area surveillance. Infrared sensors provide a second phenomenology—reducing the effectiveness of radar countermeasures. Because interceptors employ infrared seekers, the target information handover is simplified. A mix of infrared and radar sensor assets provides the ballistic missile command and control (BMC2) with a variety of options to optimize allocation of sensor to target.
- Because it maintains a *low earth orbit* and employs highly sensitive sensors, SBIRS-Low is capable of midcourse tracking and discrimination that can't be done by the Defense Support Program (DSP) or SBIRS-High. SBIRS-Low also simplifies target information handover because it passes target information from the same viewing angles achieved by the interceptor seeker.

General KADISH. SBIRS-Low is critical to an effective missile defense because it provides a continuous capability to do global surveillance and midcourse tracking of ballistic missiles.

Because it is space-based, SBIRS-Low, in sufficient orbiting numbers, can continuously monitor the earth's entire surface. This means that there will be no blind spots or safe havens from which missiles can be launched without detection by the United States. SBIRS-Low's ability to detect and track targets over the radar's horizon provides the BMDS earlier tracking, which allows earlier interceptor commitment and an increased opportunity for multiple engagements. SBIRS-Low could provide key threat development information from inland test ranges that is currently inaccessible. It also provides the capability to track missiles along their entire trajectory from launch to intercept or reentry regardless of launch point or missile trajectory. No other BMDS sensor provides this capability. The extended viewing times make precise tracking and discrimination techniques possible based on long-term observations such as heating or cooling trends.

Because it employs infrared sensors, SBIRS-Low increases the probability of BMDS engagement's success and complements radar systems in several ways. Compared with radars, infrared sensors can more effectively provide wide area surveillance. Infrared sensors provide a second phenomenology—reducing the effectiveness of radar countermeasures. Because interceptors employ infrared seekers, the Target Object Map (TOM) handover is simplified. A mix of infrared and radar sensor assets provides the BMC2 with a variety of options to optimize allocation of sensor to target.

Because it maintains a low earth orbit similar to the viewing geometry of the kill vehicle sensor and employs highly sensitive sensors, SBIRS-Low is capable of midcourse tracking and discrimination that cannot be done by DSP or SBIRS-High.

40. Senator ALLARD. Secretary Aldridge and General Kadish, can other systems provide the same or better capabilities as SBIRS-Low?

Secretary ALDRIDGE. Not entirely. While large, land-based X-Band radars placed at strategic locations around the world could provide much of the coverage, they would not provide the total coverage required for an effective BMDS. SBIRS-Low

will be able to view missiles launched anywhere on the globe without any dependency on foreign basing, thus reducing the sensors' vulnerability to direct attack and mitigating the geographic viewing limitations of surface-based radars. That is precisely why the SBIRS-Low capability is key to an effective, reliable sensor suite. In addition, a balanced infrared and radar sensor suite mitigates the effectiveness of adversary countermeasures against the BMDS. Complementary sensors based on different methodologies (i.e., radar and infrared) create a capability that is highly effective against a wide variety of countermeasures.

General KADISH. No single sensor alternative can replace a space-based infrared sensor for global, continuous surveillance and infrared tracking capabilities.

HIT TO KILL AND DIRECTED ENERGY TECHNOLOGIES

41. Senator ALLARD. General Kadish, with the termination of the space based laser integrated flight experiment, the Airborne Laser is the only major laser technology development effort being pursued by the MDA. Is it your view that laser or other directed energy weapons represent the next generation of missile defense technology after "hit-to-kill?"

General KADISH. Directed energy technology may be the next generation of missile defense technology. Clearly, we are pursuing relatively mature "hit-to-kill" technologies because we believe they can contribute capability during the midcourse and terminal phases of a ballistic missile's flight. Intercepting missiles during their boosting phase has many advantages. Unfortunately, the short burn times for many of the threat missiles make it difficult for a "hit-to-kill" vehicle to reach the target while it is boosting. The short time lines and accessibility to the launch regions make the ABL and the Space Based Laser (SBL) directed energy concepts attractive for boost phase defense. We are exploring these technologies to add to the missile defense system.

42. Senator ALLARD. General Kadish, are directed energy technologies mature enough and promising enough to warrant greater MDA focus?

General KADISH. MDA is interested in directed energy technologies for missile defense. Several demonstrations in the past (e.g., the Airborne Laser Laboratory (ALL) and the Theater High Energy Laser (THEL)) lead us to believe directed energy technologies may soon be available to contribute useful capability to the BMDS. The MDA budget submittal for fiscal year 2002 contained a large increase in funding for directed energy technologies such as the ABL and SBL. Unfortunately due to the reduced fiscal year 2002 funding for the SBL flight experiment, we have had to restructure the SBL from a flight experiment project to a component technology project.

43. Senator ALLARD. General Kadish, what role does the MDA anticipate playing in the development of directed energy technologies?

General KADISH. MDA and its predecessor organizations, SDIO and BMDO, have a long history of funding and managing directed energy technology development projects. Unfortunately, funding limitations and changing mission priorities caused us in the mid-1990s to select the SBL as our sole investment. However, due to the reduced fiscal year 2002 funding for the SBL flight experiment, MDA has had to restructure the SBL from a flight experiment project to a component technology project. The ABL was added to MDA funding and management responsibilities during the past year. MDA is committed to the flight of the first aircraft and to the first lethal shoot down of a missile target. MDA will remain involved in defining, guiding, and setting priorities for the Department's directed energy technology projects.

NUNN-MCCURDY AND MDA RESEARCH AND DEVELOPMENT CRITERIA

44. Senator ALLARD. Secretary Aldridge and General Kadish, you indicated during your testimony that the Nunn-McCurdy law would not apply to the MDA's research and development efforts. At the same time, you clearly indicate the intent to continue successful technology developments and turn off those efforts that do not live up to expectations. What criteria will the MDA use in determining which technology efforts to continue, which to discontinue, and will these criteria be formalized in any way?

Secretary ALDRIDGE. Each of the BMDS elements, and the overall program, will be managed by Missile Defense Agency using internal baselines. Progress of each development activity will be monitored against its baseline to show how each ele-

ment and its technology efforts are progressing relative to expectations. Periodic reviews will focus on the progress of each effort and produce recommendations that an effort be continued, accelerated or terminated. The metrics for such a recommendation will consider cost, schedule progress, technology maturity and risk. The Director of the MDA will make any such recommendation to the Senior Executive Council at least annually.

General KADISH. Under our capability-based approach for acquisition we are establishing metrics by which we will measure each element's or concept development's progress. Those metrics, covering cost, schedule, and progress versus risk, are a part of our ongoing assessment process for the entire BMDS.

We still use internal baselines for measuring element and aggregated system progress. We will maintain visibility and controls to adjust, stop, slow, or accelerate a program based on routine assessment. This is similar to how we have supported such decisions in the past.

Our recommendations will also consider changes to an adversary's potential capability, as well as changes in policy, operational considerations, and affordability considerations. We will bring our assessment and recommendations to the SEC at least annually for their review and approval.

[Whereupon, at 4:25 p.m., the subcommittee adjourned.]

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2003

WEDNESDAY, MARCH 20, 2002

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

NATIONAL SECURITY SPACE PROGRAMS AND STRATEGIC PROGRAMS AND SYSTEMS

The subcommittee met, pursuant to notice, at 2:34 p.m. in room SR–232A, Russell Senate Office Building, Senator Jack Reed (chairman of the subcommittee) presiding.

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

Majority staff members present: Madelyn R. Creedon, counsel; and Kenneth M. Crosswait, professional staff member.

Minority staff members present: L. David Cherington, minority counsel; Brian R. Green and Thomas L. MacKenzie, professional staff members.

Staff assistants present: Andrew Kent and Thomas C. Moore.

Committee members' assistants present: Erik Raven, assistant to Senator Byrd; Elizabeth King, assistant to Senator Reed; Richard Kessler, assistant to Senator Akaka; Eric Pierce, assistant to Senator Ben Nelson; John A. Bonsell, assistant to Senator Inhofe; and Douglas Flanders, assistant to Senator Allard.

OPENING STATEMENT OF SENATOR JACK REED, CHAIRMAN

Senator REED. Let me call the hearing to order and welcome both Secretary Teets and General Eberhart as well as my colleagues Senator Inhofe and Senator Nelson. Senator Allard will join us momentarily.

The Strategic Subcommittee meets this afternoon to discuss national security space programs and strategic programs. We have two panels today. On the first panel, we will discuss space programs and issues with Gen. Ralph Eberhart, the Commander in Chief of U.S. Space Command, and Peter Teets, the Under Secretary of the Air Force and Director of the National Reconnaissance Office (NRO). On the second panel we will discuss strategic systems and issues with Adm. James Ellis, the Commander in Chief of U.S. Strategic Command. Admiral Ellis will be accompanied by Maj. Gen. Franklin Blaisdell and Rear Adm. Dennis Dwyer.

We have a lot to cover this afternoon, particularly in the area of space programs. The Defense Department's space satellites provide our Nation's military with precise guidance for our weapons, navigation for our troops, sophisticated intelligence, and other critical data. Given the importance of space to our current and future military operations, it is troubling that a number of our major space acquisition programs have cost and schedule concerns.

Lt. Gen. Brian Arnold, the new commander of the Air Force's Space and Missile Systems Center, was recently quoted as saying: "In virtually every one of our major space programs, we are out of control on cost and schedule." Unfortunately, basic problems with the way some space programs are managed appear to have contributed to these cost and schedule problems.

Against this backdrop, the Pentagon has begun a major overhaul in how it manages and oversees its space programs. It has delegated much of the oversight for both Air Force and NRO space programs to the Under Secretary of the Air Force. While this may help coordinate the space efforts of these two organizations, which I support, I am concerned that the historical oversight provided by the Office of the Secretary of Defense (OSD) for Air Force space programs may not be as strong as it should be. The inherent jointness of all space programs and the current problems with these programs argue for stronger, not weaker, oversight by the OSD.

In addition, a certain level of oversight is required by law for all major defense acquisition programs, including space programs.

Today we will discuss how the Defense Department plans on providing oversight for its space programs, as well as look at some of the specific programs that have run into trouble as well as the Department's actions to implement the recommendations of the Space Commission's report.

Now I would like to recognize the ranking member, Senator Allard. Senator.

STATEMENT OF SENATOR WAYNE ALLARD

Senator ALLARD. Thank you, Mr. Chairman. I also would like to welcome our witnesses today.

Today we have the challenging task of reviewing the full range of policies, programs, and budget requests for space and strategic systems. Both of these areas have been marked by controversy and change in the recent past. Today I believe everyone recognizes that space is becoming more and more important to our military and indeed to the well-being and prosperity of all Americans. Navigation, weather, communication, and imagery satellites enable the full range of modern military capabilities that allow our forces to thoroughly dominate the modern battlefield.

Yet, with this increasing significance, we must pay attention to the safety and security of our Nation's space assets and our ability as a Nation to sustain these capabilities in the near term and expand them in the future. We have serious reason to be concerned. First, U.S. space assets are increasingly vulnerable to attack. Director of the Central Intelligence Agency (CIA) George Tenet, and Vice Adm. Thomas Wilson, Director of the Defense Intelligence Agency (DIA), testified just yesterday before the full committee

that a number of nations and non-state entities are developing the means to disrupt, degrade, or defeat U.S. space systems.

Our increasing reliance on space-based capabilities makes these vulnerabilities all the more disturbing. Indeed, the Space Commission chaired by now-Secretary of Defense Rumsfeld noted that we are ripe for a "space Pearl Harbor."

Second, space programs have not had a stellar management record in the recent past. Key programs such as the Space-Based Infrared Systems (SBIRS)-High early warning satellite system have suffered developmental difficulties, schedule delays, and cost increases. Yet, the requirements for these programs remain compelling and I am not aware of viable alternatives to meet these requirements.

Third, while senior DOD leaders have identified space capabilities that could transform how our military fights, I am not yet convinced that the Department has fully embraced these efforts or that congressional critics of space programs are ready to fully support them. For example, the Air Force supports a transformational communications architecture that could allow much more efficient use of communications satellites and greatly increase communications bandwidth. But I am concerned that this new architecture is not well understood and could have a ripple effect on communications satellites now being developed.

Space-Based Radar (SBR) and the Spare-Based Infrared System (SBIRS)-Low are both systems that promise tremendous new capabilities and are strongly supported by our military leaders. Last week, in fact, Secretary Aldridge, General Kadish, and General Eberhart all endorsed SBIRS-Low as an important priority. But congressional support for these key efforts has been problematic.

Fourth, organization and management processes are going through a period of substantial change. On the one hand, I applaud the initiatives to correct poor management of the space programs in the past. On the other hand, we all need to be concerned during any period of change that these changes are responsive to past problems and effective in correcting them. Any time bureaucratic interests are challenged during a reorganization, good intentions can be derailed both subtly and quickly.

Likewise, how we think about strategic systems is changing dramatically. The Nuclear Posture Review (NPR) released in January is a truly radical document. It addresses the tremendous changes in the international security environment over the past decade by reformulating the nuclear triad into a new triad that includes not only nuclear forces, but precision conventional munitions, active and passive defenses, and the defense industrial infrastructure.

This formulation represents a fundamental shift in how we look at strategic issues, a significant step away from mutually assured destruction (MAD), less reliance on nuclear weapons, increasing reliance on missile defenses, and a range of options to deal with a range of threats to and attacks on the United States and its forces and interests by any of a number of potential adversaries.

This dramatic reformulation brings with it new questions about the role of Strategic Command, the role of nuclear weapons, and Strategic Command requirements. These questions I think were inevitable, given how much the world has changed since the end of

the Cold War. But the NPR has brought them into sharp focus, and today's hearing will provide us some opportunity to address them.

We are fortunate to have Under Secretary Teets and General Eberhart for the space panel and shortly thereafter Admiral Ellis, Major General Blaisdell, and Rear Admiral Dwyer for the strategic panel to talk about these critical issues.

Again, I thank each and every one of you for taking the time out of your busy schedules to join us today and I look forward to your testimony.

Senator REED. Thank you, Senator Allard.

Senator Nelson, do you have a statement?

Senator BEN NELSON. Yes. Thank you, Mr. Chairman. I too want to thank both panels of witnesses for appearing here today to discuss our nuclear security, space, and strategic programs. I especially would like to thank Admiral Ellis from Offutt Air Force Base, Strategic Command, in Nebraska for being here today. General Eberhart, I very much appreciate the opportunity to visit with you today about space assets.

This year we are again trying to determine whether the budget provides enough for our strategic policy and protection. There is also added concern because we realize that we are no longer, if we ever were, a fortress that cannot be penetrated. With the limited resources and the prioritization that have to go on, we must, in fact, raise questions.

But some of our adversaries continue to pursue nuclear technology and, if gained, will not hesitate to use it. Saddam Hussein has stated that as long as other countries possess ballistic missiles he is going to continue to attempt to gain the same leverage. So it is imperative that our expenditures are both cost effective and are carefully allocated so our children and grandchildren can enjoy the same sense of security that we have enjoyed in the past and look forward to having in the future.

So I look forward to hearing your testimony, your comments, and the opportunity to raise some questions as we go along. Thank you very much.

Thank you, Mr. Chairman.

Senator REED. Thank you, Senator Nelson.

Senator Inhofe.

Senator INHOFE. Mr. Chairman, I do not have an opening statement, but I agree with what Senator Nelson said in his remarks. Saddam Hussein also said that at the end of the Persian Gulf War, if we had waited 10 years to go into Kuwait the Americans would not have done what they did because he would have a missile that could reach them. Here it is, 10 years later.

So I want to get into a line of questioning as to the immediacy of threats and where they are, as much as we can do it in an open session like this.

Thank you, Mr. Chairman.

Senator REED. Thank you, Senator Inhofe.

General Eberhart, we will begin with you and then we will turn to Under Secretary Teets for his opening statement. Both of you have submitted prepared statements. Both will be included in the record, and you may summarize as you wish.

General Eberhart.

STATEMENT OF GEN. RALPH E. EBERHART, USAF, COMMANDER IN CHIEF, UNITED STATES SPACE COMMAND

General EBERHART. Thank you, Mr. Chairman. It is indeed a pleasure to be back with this subcommittee. It is also a pleasure to represent the wonderful young men and women in the North American Aerospace Defense Command (NORAD), U.S. Space Command, and Air Force Space Command. They are doing remarkable things in both Operation Noble Eagle and Operation Enduring Freedom.

When I talk of these individuals, I am talking about a truly joint combined team of Canadians and Americans, soldiers, sailors, airmen, marines, civilians, and our contractors, all doing what is necessary to make sure we succeed in these very important mission areas.

In Operation Noble Eagle, to date, we have flown over 19,000 sorties in support of Operation Noble Eagle, making sure it is safe for people to fly in our airspace. We have done this without incident or accident, which speaks to the professionalism and the skill of those aviators—once again, they are aviators of all Services—and to those who generate the sorties, maintain the aircraft, and make it possible for them to fly.

I would also offer that we have achieved a new level of jointness in this operation, also reflected in Operation Enduring Freedom. But this one is special in terms of the cooperation that exists between the Services and the FAA, Customs, the Coast Guard, and other law enforcement agencies. This is a sense of jointness that we must continue to cultivate as we move ahead in terms of homeland security.

We have flown over 19,000 sorties, at a cost on the order of $500 million. I think that we have done this very professionally. It has served its purpose, but in the long run this is not the right way to work this problem. The right way to work this problem begins right on the ground. It begins right at our airports, our airfields, in terms of improved security, the steps that we have already taken, the steps that we are committed to take in the future.

It is also in improved security on board our aircraft in terms of air marshals, in terms of briefings to crews to actively resist, in terms of cockpit doors that are secure and cannot be penetrated by a terrorist, in terms of improved cooperation, as I said, with the FAA, so that when there is an anomaly, it is immediately shared with NORAD and collectively we take the appropriate action. It is also the ability for NORAD now to not just look out for external threats, but also have a radar picture so we can see threats in the internal, the interior of the United States. We are working that connectivity as we speak. So that is the way to work this problem in the longer term.

Let us now turn to what we are doing in terms of Operation Enduring Freedom to support Gen. Tommy Franks and those brave young men and women who go in harm's way. Our primary contribution has been in the mission area of force enhancement. We do things like improve satellite communications. To give you a feel for how far we have come since Operation Desert Storm, we are providing Tommy Franks today about seven times the bandwidth

that was available to General Schwarzkopf in Operation Desert Storm, seven times.

So that allows you to do a lot of things through reachback, that cuts down on your footprint in the theater. If you look at people deployed in this conflict versus Operation Desert Storm, there is about 322 times as much bandwidth available per person deployed—that's very impressive.

So we must stay the course in terms of the Advanced EHF, the wideband gap-filler, and the UHF capability for our mobile users. I believe that that is a good investment in terms of situational awareness, command and control, and in terms of the effectiveness, efficiency, and lethality of our forces.

We provide weather support. We provide updated weather information. We do that essentially on the half hour, as opposed to in the past where we would have done it on the hour for General Franks and his folks. So not only observations, but forecasts, and also space weather and what effect that space weather might have on their operations. In most cases we are referring to their communications capabilities.

Next, missile warning. We do this through the Defense Support Program (DSP). Thank goodness we have not had to call a missile shot to Tommy Franks or his forces, but we are watching closely to make sure the enemy has not launched a Scud or similar type short-range ballistic missile.

We also use this DSP for battlespace characterization, so we can essentially do some combat assessment, and some bomb damage assessment, using this system. Bright young men and women out there have figured out how to use a system that was designed to detect ICBM launches in these and other exciting ways.

That is why we need the Space-Based Infrared System referred to by Senator Allard. That is so very important, not only for the national mission, but also for operational and tactical levels of warfare, to support all warfighters regardless of the medium in which they fight.

Finally, in terms of computer network operations, we immediately went to Information Condition (INFOCON) Alpha, which I believe paid off in terms of securing our networks. I believe it also sent a valuable message in terms of deterrence. We actually saw for the first few months after this horrific event on September 11 that the number of attempted probes actually dropped by half. I think that is for several reasons. I think, one, because we went to INFOCON Alpha. I also believe that it was not patriotic at that time to try to hack into our system. I also believe that offshore hackers knew we were mad and decided not to test us during this period of time. I am sad to report that those probes have now returned to the level that we saw before September 11.

So in summary, your air and space warriors out there of all Services, to include our very important civilian complement, are working hard to ensure that we succeed in both Operation Noble Eagle and Operation Enduring Freedom. On their behalf, I thank this subcommittee for your continued support over the years, but more importantly for what you will do for us in the future.

Thank you.

[The prepared statement of General Eberhart follows:]

PREPARED STATEMENT BY GEN. RALPH E. EBERHART, USAF

Mr. Chairman and members of the subcommittee:

Thank you for this opportunity to appear before you today representing the outstanding men and women of North American Aerospace Defense Command (NORAD) and United States Space Command (USSPACECOM). The soldiers, sailors, airmen, marines, civilians, reservists, and guardsmen serving in NORAD and USSPACECOM have been instrumental in our success to defend the homeland and attack terrorist factions in the global war on terrorism. At home or abroad, the commitment of our Service men and women to the Nation's security has been nothing less than phenomenal.

PEOPLE—OUR NUMBER ONE PRIORITY

Our first priority is our people. Our warfighting edge depends on the dedication, professionalism, and sacrifice of the men and women in our Commands. Without them, even our most effective weapon systems are of little value. As always, we need to continue to recruit, retain, equip, and train our entire force.

We appreciate the critical role the members of this subcommittee have played to improve their quality of life. The Fiscal Year 2002 National Defense Authorization Act reflected the country's confidence in and concern for the men and women who serve in our Armed Forces. Our people have heard your message and are grateful for your actions. This year's Defense Authorization Act provides many important quality of life improvements such as needed pay raises, more robust health benefits, improved housing benefits (better on-base housing and increased off-base housing allowance), and greater educational opportunities. All of these are key to helping us retain and recruit the quality force our Nation needs.

The men and women of our Commands serve in virtually every location where U.S. and allied forces operate. To the best of our ability, we are safeguarding our people and facilities by continuing to conduct regular anti-terrorism training, assess and correct our own vulnerabilities, and educate our people to be constantly on guard. We do not view force protection as a mission unto itself, but inherent in all we do.

NORAD

For 44 years, NORAD has adapted to the changing threats by transitioning from an initial "air" defense orientation to a broader "aerospace" dimension—one that also provides surveillance and warning of ballistic missile attacks and space events. Our ability to provide surveillance and control of U.S. and Canadian airspace remains vital and constitutes a critical component to the defense of North America. The unprecedented attacks on September 11, 2001 were a reminder to the United States of the need to detect, assess, and warn of hostile aircraft or missile attack against North America.

Operation Noble Eagle (ONE). Prior to September 11, 2001, our air defense posture was aligned to counter the perceived external threats to North America air sovereignty—we considered flights originating domestically as "friendly by origin." Within this context, our aerospace warning and control missions were oriented to detect and identify all air traffic entering North American airspace, and if necessary, intercept potentially threatening inbound aircraft. In response to the attacks on September 11, 2001, NORAD's mission has expanded to protect North America against domestic airborne threats.

On September 11, 2001, we quickly transitioned to an interoperable, joint, and interagency force consisting of active, Reserve, and National Guard units, and U.S./Canadian military aircraft and naval vessels. Over 13,000 men and women are participating in ONE activities on a day-to-day basis. For the first time in NATO's history, Article V of the North Atlantic Treaty was invoked in defense of the U.S. homeland. As a result, seven NATO Airborne Early Warning aircraft and nearly 200 people from 13 nations are serving side-by-side with our forces to ensure the safety of our citizens.

NORAD forces remain at a heightened readiness level to counter potential threats. In all, over 19,000 sorties have been flown over the U.S. and Canada in support of ONE. By contrast, only 147 sorties were flown as part of the NORAD air defense mission during all of 2000. To the credit of the outstanding men and women involved in this critical homeland defense mission, all sorties to date have been executed without a mishap. Our success is the result of the professionalism of our people and cooperation between the U.S. and Canada.

In addition, we have partnered with the Federal Aviation Administration (FAA) and NAVCANADA to streamline notification between regional and sector operations

centers, to improve communications connectivity, and to deploy additional portable radars in "blind spots" across the country for better interior coverage. The result is a more rapid, reliable response to FAA requests for assistance as incidents unfold. With the approval of the President and Secretary of Defense, we have also developed effective rules of engagement for hostile acts over domestic airspace to ensure the safety of our citizens and the protection of critical infrastructure.

We continue to improve our procedures and coordination with the Office of Homeland Security, the FAA, civilian law enforcement organizations, and other government agencies from the U.S. and Canada. Feedback regarding our air defense support to National Security Special Events such as the Super Bowl and 2002 Winter Olympics has been very positive.

We are heartened by the progress made to improve security at our airports and aboard aircraft. Measures such as new passenger and baggage screening procedures, heightened terminal security, hardened cockpits, and more air marshals are our first, and best, defense. This increased vigilance should deter foul play on the ground and reduce the need to commit fighters in the air. We believe our NORAD air defense capabilities are the last line of defense; when NORAD interceptors are called to action, we are exercising the Nation's option of last recourse. This progress made to secure our airports, aircrews, and aircraft has made flying in the U.S. and Canada safer than at any time in aviation history.

Low-Altitude Air Threat. In addition to traditional air defense threats, we need the capability to defend North America against low-altitude, air-breathing threats such as cruise missiles, crop dusters, and general aviation traffic traveling below 5,000 feet. This is a significant challenge in congested population areas due to volume of air traffic, as well as the northern regions in which general aviation serves as the primary means of travel between remote communities. We advocate a three-pronged approach to counter this evolving threat. First, through the efforts of the North American Aerospace Surveillance Council, we will continue to improve our wide-area surveillance around the perimeter and internal regions of North America. Our goal is to provide a single, integrated air picture of North America that is made available to NORAD, FAA, NAVCANADA, and other government agencies. Second, we will support an Advanced Concept Technology Demonstration to assess alternative surveillance technologies that can support this goal. Finally, we will leverage law enforcement initiatives related to general aviation (specifically for indications and warning of potential incidents), emerging command and control capabilities, and other research and development efforts.

Resources. We appreciate your quick passage of the Defense Emergency Response Fund. As a result, we have been able to address several critical command and control shortcomings highlighted by the terrorist attacks. Specifically, we are upgrading our Battle Control System from vintage 1970s technology to enable us to provide real-time display of North American airspace, and provide effective command and control of our air defense aircraft. Additionally, we will be able to tap into a more extensive array of radars and sensors, process data more timely and accurately, and monitor a larger number of aircraft across a broader area, which will improve our situational awareness at all levels. In the long term, we remain committed to the sustainment and modernization of our air defense command and control infrastructure.

Homeland Security. We remain engaged as the DOD explores options for the formation of a new command for homeland security. Our focus is to maintain current readiness and meet the requirements of this vital mission, regardless of the command option selected.

USSPACECOM

Established in 1985, USSPACECOM is charged with the missions of force enhancement, space control, space support, planning for force application, and most recently, the DOD's computer network operations. While we prosecute the war on terrorism, the decisive advantage space and information-based capabilities provide to our warfighters will continue to be critical to our Nation's success.

Operation Enduring Freedom (OEF). We continue to bring every space and information operations (IO) capability to bear for General Tommy Franks at CENTCOM and the other Combatant Commanders. Currently, we have people deployed in support of OEF to include a robust Space and Information Operations Element (SIOE) forward at the CENTCOM Headquarters. In addition, we are leveraging an SIOE reachback capability at Peterson AFB to provide additional space and IO expertise and planning support to CENTCOM and the other Combatant Commanders in support of the global war on terrorism.

Force Enhancement. Our force enhancement efforts over the past decade have helped us integrate space into joint and coalition operations. OEF has illustrated again the effectiveness of, as well as our reliance on, these systems.

Over 50 percent of the precision-guided munitions employed in OEF are Joint Direct Attack Munitions, guided by Global Positioning System (GPS). The all-weather, day-night accuracy of these weapons gives our warfighters a decisive advantage. Similarly, GPS has become a necessity for civil authorities and commercial industry around the world. From precision farming to financial transactions to surveying remote parts of the earth's surface, every sector of our society relies on the navigation and timing services provided by this system. As a result, we have initiated a modernization program to provide a more robust anti-jam capability for our military forces, and additional signals for civil and commercial applications. We appreciate Congress' continued support to properly sustain and modernize this national resource.

Missile warning continues to be one of our top priorities. The Defense Support Program (DSP) has served as our mainstay for strategic missile warning for over three decades. Through innovative improvements, we have successfully fielded new theater missile warning and battlespace characterization capabilities to provide direct support to theater commanders and deployed forces. While DSP has served us well, we need the improved detection capabilities of the Space-Based Infrared System (SBIRS) to counter emerging strategic and theater ballistic missile threats. The SBIRS system-of-systems will be essential to our future early warning and space surveillance capabilities, ballistic missile defense systems, and will provide commanders better battlefield situational awareness. We are aware of the SBIRS acquisition difficulties. However, the Joint Requirements Oversight Council's revalidation of our warfighter requirements in January 2002 reconfirmed the urgency to develop and field this critical capability. Reliable and secure satellite communications (SATCOM) systems are also vital to our military's readiness. In OEF, we are providing 322 times the communications bandwidth per person deployed compared to Operation Desert Storm a little over a decade ago. This exponential growth reaffirms our need to modernize our capabilities with a blend of military, civil, and commercial systems.

Computer Network Operations. On April 2, 2001, we activated the Joint Task Force-Computer Network Operations (JTF–CNO) to better align our computer network defense and attack missions and improve unity of command. In addition, the JTF–CNO makes more efficient use of available resources, establishes a clear cross-agency coordination process, and eases integration with the intelligence community and other mission partners. Computer Network Defense continues to be our top priority, with the goal to ensure stable, effective networks for the Department of Defense. Our experience with the Code Red Worm and its variants underscored our reliance on Internet connectivity and the vulnerability of our gateways. While the effects of many viruses and intrusions caused considerable damage to the commercial sector, we have been able to keep our networks operating at peak performance. In OEF, we have sustained proactive defensive postures based on potential threats, verified Information Assurance Vulnerability Assessment compliance, and maintained heightened operational security levels. For the long term, we are assessing technical and operational solutions to further strengthen the Defense Information Infrastructure and develop computer network attack capabilities for all our warfighters.

Space Control. The political, economic, and military value of space systems makes them attractive targets for state and non-state actors hostile to the U.S. and its interests, especially as an asymmetric method for leveling the playing field. Not only are threats emerging on a daily basis, but access to advanced commercial space services continues to chip away at our information superiority edge.

In response, our first priority should be to field effective space situational awareness capabilities that enable us to identify, track, and characterize potentially hostile threats. We must understand potential adversaries' intent and be capable of warning of hostile acts before they occur. We will also need to develop new capabilities for operations through, to, from, and in space. Along with increased vigilance on our part, these efforts will serve as a deterrent to would-be attackers.

Space Support. The path for Evolved Expendable Launch Vehicles (EELVs) is clear as we prepare for the first commercial launches of the Atlas V in May 2002 and the Delta IV in July 2002. Our first DOD EELV launch is scheduled for September 2002. By contrast, we still have much work to do to determine our long-term strategy and the investments needed for Reusable Launch Vehicles (RLVs). We are partnering with the Air Force and National Aeronautics and Space Administration (NASA) to develop an RLV Roadmap that will be released within the next few months. We are excited about the potential military application of RLVs and believe

early missions could include satellite reconstitution, refueling, and intelligence, surveillance, and reconnaissance. RLVs hold tremendous promise as we strive to better meet warfighter needs by providing a "launch on demand" capability in the future.

Space-Based Radar (SBR). The requirement for a SBR capability remains valid. Our military operations require the day-night, all weather, broad-area surveillance capabilities a SBR system offers. In response to the Fiscal Year 2001 DOD Authorization Conference Report, the Deputy Secretary of Defense has recently signed a multi-service, multi-agency SBR roadmap, which brings together requirements for DOD and national users. As part of the SBR roadmap implementation, we are involved in an analysis of alternatives to allow DOD leadership to make SBR decisions as we consider other intelligence, surveillance, and reconnaissance needs.

Radio Frequency Spectrum. Access to the radio frequency spectrum is considered essential to our success in all future military operations. We depend on the 1755–1850 MHz band to perform a host of critical DOD command, control, and communications functions, as well as to operate many of our military satellites. It is also the preferred operating band of the U.S.-based communications industry as they develop the third generation wireless services. Without question, limiting our access to this band or forcing our move to another band could have serious consequences in terms of combat capability. We need to achieve the right "win-win" solution and will continue to work with all parties to find the best answer to this challenge. We ask for your support to protect the spectrum needed to execute critical warfighting missions.

Space Commission. We continue with implementation of the Space Commission Report recommendations. Specifically, we are preparing for the split off of Air Force Space Command from NORAD and USSPACECOM on April 19, 2002. We believe the changes being made will help ensure our military and national space communities are ready to meet the challenges ahead.

Partnerships. Effective partnerships across the entire space and information communities—military, intelligence, civil, and industry—are essential to better leverage our space and information capabilities. We continue to work with the NRO, National Imagery and Mapping Agency (NIMA), and National Security Agency (NSA) to seek new avenues to improve support to warfighters and national decisionmakers. In addition, we are working with the NASA to explore common space systems, increase our space surveillance capability, and improve human spaceflight safety. Finally, through our partnerships with other agencies, we are investigating ways to collectively support our computer network operations mission.

We need to balance the advantages of commercial partnerships with the inherent risks associated with expanding our use of commercial systems. We do this by assessing our vulnerabilities and ensuring protected military systems are available for our most critical military missions.

CONCLUSION

We believe the NORAD and USSPACECOM missions will continue to grow in importance as the Nation responds to current and emerging threats. Our capabilities will help build the foundation needed to fulfill DOD's transformational goals to protect the U.S. homeland and critical bases of operation, deny sanctuaries to our enemies, as well as project and sustain combat power. We will also serve a central role as the DOD leverages information technology, conducts effective information operations, and strengthens space operations in the future.

We continue to find new ways to improve these unique capabilities by integrating them into all aspects of our military missions. As we develop our next generation systems, we should invest the necessary resources, energy, and intellectual capital to protect our vital interests and sustain our lead in the space and information domains. We appreciate Congress' continued support of our people and to maintain our high state of readiness. With your help, we will ensure our air defense, space, and information forces continue to play a key role in our Nation's defense.

Again, I am honored to appear before you and look forward to your questions.

Senator REED. Thank you, General Eberhart.

Mr. Secretary.

STATEMENT OF HON. PETER B. TEETS, UNDER SECRETARY OF THE AIR FORCE AND DIRECTOR, NATIONAL RECONNAISSANCE OFFICE

Secretary TEETS. Thank you, Mr. Chairman, and good afternoon to you. I would like to start by thanking the Armed Services Com-

mittee for their support of my nomination and then subsequently the Senate for confirming my nomination last December 7. I was subsequently sworn in as Under Secretary of the Air Force on December 13 and want to assure you I have been working hard ever since.

I find that I have arrived on the scene at what I would call an opportune time. I am the beneficiary of the results of three important commissions that were established to look at the national security space situation. One has been referred to widely, the National Security Space Commission, chaired by Secretary Rumsfeld, and I will have more to say about that in a moment or two and also be happy to take questions about implementing those recommendations.

There were also two other important commissions. There was an NRO Commission. Senator Allard participated in that as well, of course, and that was an important piece of work which gave some recommendations for the NRO. I have taken those recommendations seriously and we are in the process of implementing that commission's results as well and recommendations as well.

Then lastly, perhaps you are familiar with the fact that Don Kerr headed up a remote sensing panel that provided an important database to the intelligence community regarding remote sensing capabilities and the future of remote sensing in our country.

So I really have had the benefit of all three commissions' results completed and I find all three to have very valuable recommendations for implementation. All of it leads in a way to a situation where I think we can realistically look forward in the relatively distant future toward a situation in which the United States can achieve something that I would call universal situational awareness. We can in fact have collection activities going on in space which, when properly merged with air assets, properly merged with activity on land and on the sea, we can indeed find ourselves in a situation where we can know what is going on around the Earth. Obviously, this war on terrorism has taught us that this is a vitally important goal to try and strive toward.

At this point in time, I would tell you that I have four immediate priorities, however, that will stop far short of the ultimate vision that I just described. The four priorities are: first of all, getting our space acquisition programs on track. We have heard already today references to our SBIRS-High program, and it is a program that is experiencing considerable difficulty and trauma.

Since taking on the job, I have had a number of intensive reviews on the subject of SBIRS-High and we are currently on a path, a parallel path really, of trying, number one, to see if we can properly restructure the contract that is in place to provide a contract that can be executed and that can deliver a system that can meet all the requirements that have been specified for it.

In parallel with that, however, I have been asked to look into an alternate option using some NRO people and assets to see if we can find an alternative which can provide the necessary and vitally important information that will come from SBIRS-High.

I will be more than pleased to answer additional questions about SBIRS-High and how we are proceeding with it. But I would like right now to point out simply that as the newly named executive

agent for DOD space I work and will continue to work extremely closely with Secretary Aldridge as the Under Secretary of Defense and the senior defense acquisition official. I have and will continue to work closely with John Stenbit, the Assistant Secretary for C^3I.

There is no desire on my part to try and exclude the Office of the Secretary of Defense or any of the necessary components that can add value to the process, and I would certainly want them to continue to have an oversight role. I do think, however, that as we have been trying to implement the National Security Space Commission recommendations, we have an opportunity to put together an organization which can look at the intelligence community activity in the NRO as well as Air Force and become excellent stewards of Army, Navy, and Marine Corps space requirements.

Of course, as we have started to create this new national security space organization, we have included within it the national security space architect, who happens at this point in time to be Army General Steve Farrell. So we are doing important architectural work that crosses the entire national security space community and we have an opportunity now to also put together another organization called the Directorate of National Security Space Integration, which can migrate best practices, if you will, across all the national security space community. Again, I will be more than happy to answer more questions on that as we move forward.

Now, another very important priority is to drive hard on the issue of assured access to space. I think it's clear that, from the results that have come back from the current war on terrorism, our space assets are more important than they have ever been. We need to be in a situation where we can sustain a launch failure. After all, I think we all know that the highest risk part of a space mission is in its initial deployment. The space launch event is a traumatic event, it is a high energy event, failures sometimes occur.

We need to be in a position to be able to sustain a failure and still provide the next launch in a short period of time. So in looking at that, one of the things we want to do is drive hard on the Enhanced Expendable Launch Vehicle (EELV) program to make certain that there are not single point failures which could cause both launch systems to be down in the event of the failure of one of them, and we will be looking hard at that.

An additional priority that I have is to really look hard at how we can apply best practices across the national security space community, and I offer just a couple of examples. The NRO over a period of some 40 years has developed a solid system of acquisitions that has thorough oversight and yet which can be implemented in an expedited fashion. Typically speaking, milestone decisions can take place in a period of 90 days, rather than 180 days, and we can improve the cycle time by getting the right people together, sitting around the table, and addressing problems in real time. So I think this whole idea of national security space integration can lead to spreading best practices across the community.

Another example would be in the launch system process for actually preparing systems for launch. It turns out that the Air Force and NRO have classically had two different processes or practices for readying launch systems for the launch event. We can rapidly

change that. We can drive hard on a single practice and process that can increase reliability and give us more confidence in our space launch capability.

Lastly then, another immediate priority that has come from the many commissions that have looked at the space situation is the need to develop a professional cadre of people across the space community. I know that General Eberhart at Air Force Space Command has been working extremely hard to make that a reality. The Chief of Staff of the Air Force at the last Corona meeting that we had focused on that very event, and General Eberhart presented his views on how the Air Force could move forward on that.

I have had several discussions with Under Secretary Livingstone and Under Secretary Brownlee relative to Navy and Army participation in developing this cadre of space talent across all the military services and think we can make some strong progress there.

I would close my remarks by simply saying that in this roughly 3 months that I have been in the job I have received terrific support from General Eberhart and Space Command. I have received great support from Secretary Roche and Chief of Staff of the Air Force General Jumper. Secretary Rumsfeld has also provided strong support.

Frankly, I feel as if I am in a situation where I have been empowered to make a difference in this national security space arena and I look forward to that. I should also add that the Director of Central Intelligence (DCI), George Tenet, has been enormously supportive in helping to merge NRO activity with DOD activity. I do think we have an opportunity to make a difference in the national security space arena.

Thank you very much.

[The prepared statement of Secretary Teets follows:]

PREPARED STATEMENT BY HON. PETER B. TEETS, UNDER SECRETARY OF THE AIR FORCE

It is my distinct honor to be before the subcommittee today representing the "space side" of the world's greatest air and space force. You have previously heard from the Secretary of the Air Force and the Chief of Staff about the state of affairs of the Air Force as a whole. I believe the "Top 4" of the Air Force—the Secretary, the Chief of Staff, the Vice Chief, and I—make a good team. We are of one mind regarding the vision of a Total Air and Space Force providing global reconnaissance and strike across the full spectrum of operations in the service of this great Nation. Given the focus of this subcommittee, and my role in the implementation of the National Security Space Commission, I plan to focus my remarks today on the space responsibilities and capabilities of the Air Force.

The commission Congress chartered to assess the organization and management of national security space, commonly referred to as the Space Commission, recommended several changes in the way the Department of Defense (DOD) is organized to perform the national security space mission. Secretary Rumsfeld chaired that commission before he became Secretary of Defense (SECDEF), and he's provided the Air Force with tremendous support in our implementation efforts. Secretary Roche and I are in lock step with his directions for implementing the Commission's recommendations.

I am delighted to report that the Air Force has made good progress with the tasks assigned to it by Secretary Rumsfeld. In order to apply the "cradle-to-grave" approach recommended by the Commission, we have transferred command responsibility for the Air Force's Space and Missile Systems Center (SMC) from the Air Force Materiel Command to the Air Force Space Command to align space research and development efforts and operations under one organization. We have also made the SMC Commander the Air Force Program Executive Officer for Space. I have been jointly named Director of the NRO by the DCI and the SECDEF. Serving jointly as the Under Secretary of the Air Force and as the Director of the NRO is not with-

out precedent. The first Director of the NRO, Dr. Charyk, served in this dual role capacity, as have several of our Nation's previous national security space leaders including Mr. Aldridge, our current Under Secretary of Defense for Acquisition, Technology, and Logistics. I have also been asked by Secretary Roche to assist him by serving as the Air Force's acquisition executive for space related systems. Secretary Rumsfeld's request that Mr. Aldridge delegate Milestone Decision Authority for major DOD space programs to the Under Secretary of the Air Force has made me the senior civilian responsible and accountable for managing the Nation's national security space program for the Department of Defense and the Intelligence Community. In my view, the buck stops with me for national security space issues—and I am thrilled and honored to have been asked to take on this important challenge.

We are in the midst of an epic struggle of good versus evil in the war on terrorism. To date, our space-based systems have performed incredibly well in support of our troops engaged in Operation Enduring Freedom in Afghanistan. Air Force aircraft have dropped nearly 7,000 tons of munitions in Afghanistan with 73 percent of that tonnage being precision guided. A good portion of that 73 percent would not be possible without today's space-based assets such as the GPS. In addition to the precision guidance supplied by GPS, our military SATCOM systems form the backbone of the information pipeline providing critical data to U.S. and allied soldiers operating in that theater. Furthermore, our satellite collection systems for weather and intelligence data have been more responsive to our warfighters on the ground than in any time in our history.

The ever-increasing significance of the Intelligence, Surveillance, and Reconnaissance (ISR) contribution to operational and tactical warfare is simply phenomenal. We can finally assess the effects of our attacks in near real time because of the contributions of GPS, SATCOM, and space-based ISR systems and all the hard work that has been done to integrate space with airborne ISR and airborne strike systems. In the near-term we will continue to focus on improving the integration of our space-based systems across the full spectrum of joint operations.

The execution of the war has demonstrated once again how critical space dominance is for successful force projection and force application. In addition, we continue to recognize the need for persistent, 24/7, all-weather, surveillance collection capabilities. We talk on the "air" side about the number of sorties generated as a measure of support and effort to a campaign. One of the best features about a space-based asset is that it doesn't require additional sorties in wartime—it's already there, on-orbit, ready when called upon. Of course, with the limitations of today's imaging satellite constellations, we aren't able to stay at any one place for very long. My vision for national security space includes leading the transformation from a reconnaissance to a surveillance mindset in order to provide persistent on-demand space-based capabilities to achieve universal situational awareness for our warfighters and our Nation's leaders.

That is a brief assessment of how I see the current national security space environment and a bit of our vision for the future. I would now like to talk about my four immediate priorities for addressing the near-term needs of the Nation's national security space portfolio. These are: (1) Getting space acquisition programs on track; (2) Providing assured access to space; (3) Integrating black and white space, applying "best practices" where applicable; and (4) Establishing a career path for space professional and leadership development.

GETTING SPACE PROGRAMS BACK ON TRACK

As the subcommittee is no doubt aware, the Air Force is facing significant challenges in several of our most important space acquisition programs. Our biggest challenge is in developing the SBIRS-High program, which is designed to provide the Nation with the next generation of missile warning capability as well as enabling missile defense. In January of this year, the Joint Requirements Oversight Council (JROC) revalidated warfighter requirements for the SBIRS system-of-systems, reconfirming the need to field this capability as soon as possible. At the same time, however, the Air Force-chartered Independent Review Team examining SBIRS-High reported a number of deficiencies in the program. It found that the program was too immature when it entered the system design and development phase, that higher-level system requirements were not properly allocated into lower-level requirements, and finally, there was a significant breakdown in execution management. These findings concern me not only because of the importance of SBIRS but also because these problems may afflict other space programs. One of the common threads of the review team's findings was that inadequate systems engineering contributed to the problems affecting SBIRS-High. So in response, I am currently examining other space acquisition programs to see if they suffer from the same problem.

It is clear that the Air Force must address these deficiencies wherever they exist in order to be a good steward of space programs and the taxpayers' money. Later in my statement I will discuss reforms we are pursuing in order to improve the stability of space acquisition programs.

As for SBIRS-High, on 31 December 2001 Secretary Roche reported a Nunn-McCurdy cost breach requiring that the Secretary of Defense, or in this case his delegate, Secretary Aldridge, certify by 3 May 2002 that:

- The program is essential to national security;
- That no less costly alternatives that provide equal or greater military capability exists;
- That new cost estimates are reasonable; and
- The management structure is adequate to manage and control the program.

It is obvious that both the contractors and the government have made mistakes with this program. I have asked my staff to prepare alternative solutions that may satisfy these criteria if it is determined that the SBIRS-High program cannot meet them. Secretary Aldridge will chair a meeting, in late April, to review both the current SBIRS-High program as well as the alternatives, and to make a decision whether to continue or cancel the existing program. I cannot stress strongly enough the need to field a system that delivers the required capabilities in time to replenish the existing Defense Support Program constellation. If the current SBIRS-High program cannot meet those requirements, it is my priority to deliver a system that can.

While we are working hard to address the problems with SBIRS-High, I would like to highlight an emerging success story in the area of military satellite communications. In the war in Afghanistan we are providing 322 times more communications bandwidth per person when compared to Operation Desert Storm 10 years ago. However, even this increased capacity is not enough to meet projected requirements. My highest priority is making certain that warfighters have the space-borne capabilities necessary to fight and win our wars, and MILSATCOM is one of those areas where the warfighters need as much capability as we can give them. To that end I have directed the National Security Space Architect office to conduct a Transformational Communications Study examining what the next generation of SATCOM systems must provide in order to meet future requirements. This study is examining a variety of capabilities and architectures that will help us achieve our goal of eliminating communications as a constraint on the warfighter. Among other things, we are looking at cutting-edge areas such as laser communications, optical links, and the development of a network-centric architecture integrating satellites and terminals to replace existing stove-piped systems. The final architecture will deliver orders-of-magnitude increase in capability over the systems in service today. I anticipate that the study, expected to be complete in July 2002, will give the military space community an integrated roadmap showing how we can deliver transformational communications capabilities to warfighters and national users in the near term.

ASSURED ACCESS TO SPACE

In delivering those kinds of capabilities to the warfighter, it is my job as the chief acquisition executive for military space programs to ensure that the United States has assured access to space. We have a lot of hard work to accomplish to make sure we have the access we need and desire.

The phrase "access to space" historically has meant launch operations and, in partnership with the commercial sector, the Air Force is striving to fulfill this mission. The Atlas V and Delta IV are expected to have their first commercial launches this summer, with the first DOD launch scheduled for later this year. The EELV is already projected to save the taxpayer well over 25 percent of the costs typically associated with our legacy launch vehicles, and it will do so while meeting our stringent requirements for safety and reliability. Beyond EELV, the Air Force continues its relationship with NASA in developing a RLV technology roadmap. We welcome the opportunity to exploit a future RLV to conduct military missions ranging from reconnaissance to on-orbit satellite support and, potentially, even force application if directed by national leadership.

In support of these launch efforts, the spacelift ranges at Cape Canaveral and Vandenberg AFB continue to be modernized to become more responsive to users and easier to maintain, while becoming less expensive to operate. These national assets are becoming increasingly valuable to both government and commercial users, and the Air Force is actively seeking new ways to exploit our civil and commercial partnerships in spacelift to increase efficiencies and reduce costs.

However, even these efforts are not enough to provide assured access to space. We are not where I want to be yet, but we are taking steps to get there.

For instance, access to space extends beyond spacelift—it also means making sure that once we get into space we stay there for the duration. As the global environment grows increasingly dangerous, we are exploring new systems, tactics, and policies that can guarantee the security and performance of our space-based assets. Our space control efforts are developing new space surveillance software that, extrapolating from existing telemetry, can tell us when our satellites are being attacked, and how. This universal situational awareness capability is vital to ensure that we cannot only rapidly identify the enemy attacking us, but also can take the appropriate measures in response. By also developing offensive space control capabilities—including counter-communications, counter-surveillance, and counter-reconnaissance systems, as well as a new "space range" to test and exercise these capabilities—the Air Force will provide our national defense leadership with a number of options in the event that our defensive systems fail to guarantee our access to space.

We are also pursuing methods of protecting the integrity of our GPS signal for both military and civil users alike. As the war in Afghanistan demonstrates, weapons like the GPS-guided Joint Direct Attack Munition (JDAM) are absolutely critical to winning battles. We must not forget that delivering this all-weather, day-and-night attack capability to the warfighter requires a modern and secure GPS infrastructure. Our GPS modernization efforts, including our GPS III satellite program, will result in a more robust signal providing the warfighter with more accurate location and targeting information. They will also give theater commanders more options to protect the signal from disruption by hostile forces, enabling our units to successfully continue the fight even when faced with a jamming threat. While the improvements to GPS are critical to our military, it must not be forgotten that a better GPS system also provides numerous benefits to civil authorities and commercial industries in America and worldwide. GPS is truly a modern American success story, and the Air Force is working hard to guarantee its performance in the future.

Guaranteeing GPS performance, as well as providing increasingly capable MILSATCOM, requires that the U.S. military maintain access to critical sections of the radio frequency spectrum. We are seeing a number of proposals to develop new wireless services using frequency bands currently required for a number of critical U.S. military capabilities. It is obviously of critical importance that we achieve a solution which meets the need of all interested parties to ensure that the U.S. military retains use of the spectrum frequencies critical to our warfighting capabilities.

Due to our increasing dependence on access to space for military, commercial, and civil missions, the Air Force must remain in the vanguard in developing innovative, reliable, and affordable space capabilities. In the future, we must do more to assure our access to space, and I am committed to a thorough review of what systems, strategies, and policies this access requires.

BLACK/WHITE SPACE INTEGRATION AND BEST PRACTICES

As our SBIRS experience clearly demonstrates, existing Air Force and DOD acquisition practices are too inflexible to address the unique requirements of space system acquisition. As part of the Air Force's Space Commission implementation planning during the summer of 2001, a series of "Best Practice" teams composed of both NRO and Air Force members were formed to align Air Force and NRO space programs and practices in various areas. As you might expect, one valuable team focused on the critical area of acquisition practices.

Over the course of this investigation, the team made a key discovery: the Air Force and the NRO already share many of the same "Best Practices." The team did find a number of areas, three on the NRO side and two on the Air Force side, that required relatively minor administrative changes to the way the NRO or Air Force did business. However, they discovered one additional, substantial difference between the way the NRO and Air Force operates. The NRO's acquisition milestone decision cycle time was much shorter than the typical DOD milestone decision cycle time for programs of similar magnitude and complexity. Obtaining a decision at a Defense Acquisition Board via the process described in the DOD 5000 series documents typically takes 8 to 12 months to get through the Integrated Product Team structure. In contrast, historical data on NRO programs shows the nominal time required to get through the NRO's Independent Program Assessment process is only 8 to 12 weeks. Months to weeks—that's a significant reduction in decision cycle time!

I'll be the first to admit that making bad decisions quicker than before would not be an improvement, but decision delays often impose unintended costs on a program

just as surely as requirements creep and program mismanagement do. Faster decisions by senior leaders can actually help provide program stability, a key ingredient to program success, by allowing the program office and contractor to spend their time performing actual development work instead of preparing for overly burdensome oversight. Faster decision cycles also support agile and flexible acquisition practices because they allow for direction from the real decisionmakers when needed, thereby enhancing our ability to make timely adjustments to our plans. This is the best way to enable our system program offices to deliver the most cost-effective capability possible to the warfighter in a timely manner.

To that end, we have adapted the NRO process to fit DOD statutory requirements and allow full involvement by OSD and the other Services. I plan to approve several "pathfinder" activities using this NRO-like acquisition oversight process to assess how this NRO process can be best applied to DOD space programs. A "pathfinder" activity for GPS-III is already underway and I expect to be able to report on its results this summer. This "streamlined" process has worked for the past 7 years at the NRO, and I see no reason why it won't work for DOD space systems.

The establishment of similar processes between black and white space is a terrific first step toward integration, but we will continue to explore other "Best Practices" and diligently implement associated findings. I'm not picky about where we find these "Best Practice" ideas. We started this effort by focusing on the Air Force and the NRO, but we are now in the process of expanding our vision to include the practices of the other Services and from industry. The motto "not invented here" will not apply on my watch—a good idea is a good idea.

The establishment of Joint Program Offices (JPO) between the Air Force, the NRO, and the other Services is also on my agenda in order to foster further continued black and white space integration. The first evidence of this will be the establishment of a JPO for Space-Based Radar in the very near future.

SPACE CAREER DEVELOPMENT AND SPACE LEADERSHIP DEVELOPMENT

Implementing these best practices and improving National Security Space management both depend first and foremost upon great people doing great work.

As part of the Space Commission implementation, we are working to describe and define the appropriate set of education, training, experience, and personnel policies needed to develop a cadre of Air Force space professionals. Air Force Space Command, under the leadership of General Ed Eberhart, has taken the lead on this very important task. The plan they are putting together focuses primarily upon the Air Force and Air Force elements of the NRO, but we are working to share our ideas, problems and our potential solutions with the other Services to create the necessary construct that will build and maintain the quality of our Nation's National Security Space personnel. Secretary Roche is expending significant energy to build a space community equal to the pilot community. I am wholeheartedly committed to putting the appropriate structure in place to make sure we continue to have the world's best space personnel.

CONCLUSION

Since becoming the Under Secretary of the Air Force in December 2001, I have tried to follow a rule that Stephen Covey identified in his book: "The Seven Habits of Highly Effective People" which is "Seek first to understand, then to be understood." I have spent some time getting up to speed on the issues, and we are now beginning to move out in earnest in making the changes that need to be made to transform our Nation's national security space capabilities and organizational constructs.

These are exciting times for national security space as we transform, reorganize, and establish roles, missions, strategy, streamlined acquisition policies, and space career guidelines. The Air Force and the NRO are going to lead this effort with the full integration and inclusion of our sister Services and other applicable government agencies. We obviously have received tremendous encouragement from Congress in this effort, and I thank you all for your continued guidance and support.

I am on a great team with great support from General Eberhart, General Jumper, Secretary Roche, Secretary Rumsfeld, and DCI George Tenet. When I look at the superb quality of the people that work as part of the NRO, Air Force Space Command, and the Air Force in general—I don't see how we can fail at anything that we put our effort against.

America is currently the preeminent spacefaring nation in the world. It is imperative that the national security space capabilities support our troops and national leaders. I will strive with your help and support to ensure we maintain our dominant position.

Senator REED. Thank you, Mr. Secretary. Thank you, General Eberhart, both for your excellent testimony.

Let us proceed with two rounds both of 6 minutes each. I will begin. You have already noted, Mr. Secretary, the problems of SBIRS-High. It appears to be about $2 billion over budget, a slip of 18 to 24 months in schedule. It is a critical system. You obviously need this system, as General Eberhart has indicated in his testimony also. So we have to proceed and try to, as you are doing, reform the acquisition process to get it back on track.

General Eberhart, are the original requirements for SBIRS-High still valid, and could you briefly summarize those requirements?

General EBERHART. Yes, sir. If you look at the record since about 1994, since we decided the way ahead in terms of the SBIRS program, we have first established, then periodically reviewed those. Most recently, we reviewed those requirements in January of this year once we knew that there was a problem with the SBIRS program, to make sure that in fact those requirements were still valid, that we were not marching to Cold War requirements or requirements that could have caused cost or schedule problems.

We have also done this through senior warfighters forums, where the Deputy Commanders in Chief of the unified commands get together, and then we finally go to the Joint Requirements Oversight Council (JROC). So we did that in January, formally. Then we did that again just last month, after the February meeting with Mr. Aldridge and Secretary Teets.

So I believe those requirements are valid. They are valid in terms of timing. They are valid in terms of sensitivity. They are valid in terms of what we believe we should be able to do with this system as you look across from the mission areas of strategic warning, theater warning, technical intelligence, and finally battle space characterization.

So I believe in every case, we have concluded that those requirements are valid and when we presented those requirements again when all the stakeholders were in the room with the Vice Chairman of the Joint Chiefs of Staff, we did not get any pushback, Mr. Chairman. Everyone agreed.

Senator REED. General, when do you conclude that a replacement must be in operation for the DSP program, which is our major form of national warning?

General EBERHART. Sir, we have flowed out, based on optimistic views of the health of the DSP constellation, assumptions that the next two launches will be successful, which are key. We have also looked at in case one of those launches is not successful. The details of that, Mr. Chairman, are classified. We will be able to provide that for the record, in a classified format.

But we have to stay pretty much on the revised schedule we have outlined today. If not, we in fact will have degraded capability in both theater warning and possibly in strategic warning.

Senator REED. Thank you.

Mr. Secretary, can you give us some details about how we go about fixing this problem in terms of not only substantive changes, but also the likely schedule of activities that you are anticipating?

Secretary TEETS. Yes, sir. Mr. Chairman, we are currently in the midst of a dual-forked, parallel path to look at the SBIRS program.

As you indicated, we are talking about a very serious problem that was discovered, which has created the likelihood of an 18- to 24-month slip, the likelihood of a very significant $2 billion cost overrun.

One of the things we have done is establish an independent review team (IRT) to look at and find the root cause of how this could possibly happen. I think the results of that IRT have been helpful in trying to establish rapidly corrective action and put in place a program that can be properly executed.

But because of the critical nature of the SBIRS program, we also want to have an emergency or an alternative path that, should we find ourselves in a situation where we are not confident that SBIRS-High can be put back together again, so to speak, and put on a restructured course, that we would have an alternative way of proceeding.

Now, all of this is leading up to an early May Nunn-McCurdy certification by Secretary Aldridge. So again I would reemphasize, we are not trying to take Secretary Aldridge or the defense acquisition community out of the picture. We are working with that community. The current path that we are on is to put forth, in late April, a solid look at what would a restructured SBIRS program look like. The prime contractor in this case is Lockheed Martin and Lockheed Martin has made some significant management changes at its Sunnyvale facility. They have brought in additional resources from satellite operations to bolster the management team. They brought in additional systems engineering talent. They have responded strongly, with the president of the corporation taking a strong hand in overseeing the activity that is going on.

Meanwhile, our system program director, Colonel Mark Borkowski at the Space and Missile Center, is working very hard to restructure the contract. One of the things that the IRT found is that there were some problem clauses in the contract. The contract had been made in a way that provided total system performance responsibility to the contractor. The fact is that the government needs to be the total system requirements owner and to exercise proper oversight. So the contract that we are in the process of trying to restructure will have that clause removed and the government will have total system performance responsibility and the contractor will have clear requirements laid upon him for the system, but then also a clear requirement to manage his subcontractors.

So we are putting that revised or restructured contract together right now. We would hope by the 1st of May, give or take a few days, to have that restructuring complete, go forth to Secretary Aldridge, and it is my hope that we will be able to recommend to Secretary Aldridge that he be able to recertify the program.

At the same time, however, because it is a difficult situation, we have embarked upon an alternate course, a backup course if you will, where the NRO is working diligently to look at alternative architectures which could meet fundamental requirements that General Eberhart has spoken of in perhaps some spiral development way, but in a way that we can have high confidence that we will not be left out in the cold should we determine that SBIRS-High as it is currently defined cannot be done.

Senator REED. Thank you very much, Mr. Secretary.

Senator Allard.

Senator ALLARD. Thank you, Mr. Chairman.

I have had an opportunity to visit with some of the commercial imagery people. I think we have two-thirds of the industry in Colorado. They tell me that they were used quite a bit after September 11 and that the military generally appreciated their up-to-date, very current information and data.

Secretary Teets, I am under the impression that you believe that commercial imagery can be a valuable adjunct to government imagery assets, is that correct?

Secretary TEETS. That is correct, Senator Allard.

Senator ALLARD. Do you believe that the promise of funding for commercial imaging products in Future Years Defense Program will be sufficient to convince commercial imagery firms to proceed with the development of next-generation imagery satellites?

Secretary TEETS. Yes, I do think it will. I think that commercial imagery can play an important role for government users and that includes the national security space community.

Senator ALLARD. They do not see anything in the budget that makes them think that the money is going to be out there in the future, and when they go for money to borrow to continue operations they are looking for some assurance that they are going to be able to receive financing if they can provide a service which we seem to use, particularly at times of crisis, like we did during the terrorist attacks.

So I am interested to know why you think this would be available for them?

Secretary TEETS. Well, I think that one of the important uses for commercial imagery can be in fact the intelligence community. I think that, while in an open forum I am not at liberty to talk about the National Foreign Intelligence Program (NFIP), I think you would find that there is a desire at least to use some of the commercial imagery to provide some important capability or collection requirements for the intelligence community.

Senator ALLARD. I am amazed at how many other countries seem to be getting into commercial imagery to one degree or another, and I think that there is a certain advantage to having that type of business here and not having to rely on foreign countries. So I keep looking for ways in which we can keep that as an adjunct to what our military does.

Sometimes systems are not always perfect, but if they do not work there needs to be a reliable backup. I think that we need some sort of insurance policy to make sure they are there.

On space systems acquisition, the commander of the Air Force Missile Center was quoted recently as saying that all his major space development and acquisition programs were in trouble. Secretary Teets, do you agree with that statement?

Secretary TEETS. I think it would need to be taken in context. I do think that there are serious acquisition problems within the national security space community. I would say that I have tossed and turned on numerous nights thinking how we could find ourselves in the situation we do right now.

My own analysis of that is that perhaps we had in the time of the 1990s some significant budget pressures and yet had a desire to continue on with a robust space constellation, and in so doing I think, perhaps not consciously, we assumed more risk than we have in earlier times. I find that in some of the space programs we experimented with contract clauses. We experimented with things like handing risk off to the contractor, thinking that that would somehow make the risk go away. This total system responsibility clause that I mentioned before could be an example of that.

I think other contracts have other innovative ideas to try and lower costs of the programs. On the other hand, I think we find ourselves in a situation right now where you would have to say that some of those things have not worked. So I do think that the time has come for us to get back to basics and put together contracts which are well understood by both contractor and government and can in fact be executed. While that is going to require some financial resources to achieve, I think it is a necessary ingredient and we are proceeding accordingly.

Senator ALLARD. General Eberhart, the Chairman asked most of the questions on SBIRS-Low and SBIRS-High, so I am going to ask another question here to Secretary Teets. So I am not ignoring you. I am not picking on you, Mr. Secretary.

General EBERHART. I will not take that personally.

Senator ALLARD. I do not want anybody to feel neglected here.

In response to the recommendations of the Space Commission, there have been changes in space management and organization. I have been particularly interested in this. Some of those are related to the oversight role of the OSD. This committee apparently has been getting mixed messages about what this role will be.

Secretary Teets, I am wondering if you can clarify that and share with us what your understanding is of the role of Secretary Aldridge, his staff, and his organization in the oversight of space programs.

Secretary TEETS. Sure. I have been designated as the DOD executive agent for space and as such have milestone decision authority. On the other hand, as I mentioned earlier, I intend to stay very closely coupled with Secretary Aldridge and his office. I also intend to stay closely coupled to John Stenbit, the Assistant Secretary of Defense for C^3I. They have important contributions to make.

Virtually all of the military space programs have been put in this national security space organization that now is in being, with the exception of SBIRS-Low, and I do want to just say a word about that if I may. General Kadish at the Missile Defense Agency has acquisition authority for SBIRS-Low. I met with General Kadish just yesterday, as a matter of fact, and we talked about how that acquisition would proceed and how we would work together to make sure that SBIRS-Low does indeed complement SBIRS-High and how the whole missile defense equation can come together.

The bottom line is that we are going to form a board of governors, if you will, that all participate in, General Kadish will participate, Dr. Marvin Sambur, the Assistant Secretary of the Air Force for Acquisition will participate, and we will regularly take an oversight role of what is happening on the SBIRS-Low program.

That will then be reported right up through General Kadish's chain of command, which is straight to Secretary Aldridge.

So again, I think what we are trying to do is work closely together, not trying to exclude the Office of the Secretary of Defense from any oversight responsibility for space programs, but rather have a focused national security space program where we can implement unique contracting arrangements, we can implement best practices from operations as well as from acquisition to get these space programs back on track.

Senator ALLARD. Thank you for your responses to my questions. My time is expired.

Senator REED. Thank you, Senator.

Senator Nelson from Nebraska.

Senator BEN NELSON. Thank you, Mr. Chairman.

General Eberhart, in our conversation earlier today we discussed the potential threats to America's critical infrastructure, including systems of satellites, which could obviously threaten the military and, more likely as well, commercial use of such applications. I am hoping that maybe you could speak to the subcommittee today about those threats, to the extent that you can in this open session, and what kinds of steps we are taking to protect against that kind of threat.

General EBERHART. Yes, Senator. As we discussed earlier, we are concerned about our space control mission. One of the pillars of that mission is the protection of our space assets, it was one of the transformational goals, goal number six that the Secretary of Defense outlined at the National Defense University several weeks ago, essentially ensuring that we can operate in space, that our space capabilities are not at risk.

There are technologies available out there where a foe, whether it is a nation state, a terrorist, or anybody who wishes us ill, could in fact jam uplinks, downlinks from our communications satellites. Obviously, they could attack the ground station with terrorist attacks or a military attack. They can use blinders of sorts to try to interrupt our imaging satellites.

So those capabilities are out there and those are capabilities that concern us. As we look to the way ahead, first of all we need to understand the space order of battle. We need to understand who truly has these capabilities and the details involved.

Second, we need to build not only a good defense, but in my view we need to build a good offense. Defense comes in the way of alarms so that we in fact know that somebody is tampering with our systems; two, to some extent hardening those systems so they cannot tamper with them; or three, making them redundant enough so if they take out one part of that capability, we have a backup capability that we can use or having such a robust constellation that we can use other satellites. It's also protecting our ground stations, making sure they are secure, good force protection, if you will.

I believe that over time you could even see microsatellites in escort mission roles. Those are the kinds of things that we have to understand. Those are the kinds of things we have to explore to make sure that we have space supremacy in the future.

Senator BEN NELSON. Thank you. Now, probably the most difficult question is does the budget that is before us help us achieve these goals?

General EBERHART. Sir, when you look at the additions over the last year across the budgeted program years, we have made significant increases in the amount of money that we have committed to space control. So with the support of this subcommittee and others, we believe that we will be taking the proper steps to ensure that we have protected our space assets.

Senator BEN NELSON. So you think that there is enough in research and development to continue to remain on the cutting edge and ahead of our adversaries?

General EBERHART. Sir, obviously that is a loaded question for CINCSPACE. CINCSPACE never thinks you spend enough money on space. But realistically, I think it is an amount that is satisfactory at this time, until we better understand some of these technologies and the way ahead. Then we are going to have to spend more money in terms of procurement.

Senator BEN NELSON. Thank you, General.

Thank you, Mr. Chairman.

Senator REED. Thank you, Senator Nelson.

Senator Inhofe.

Senator INHOFE. Thank you, Mr. Chairman.

I will only be able to stay for this one round, so let me do as much as I can. General Eberhart, since Senator Allard spent all his time with Secretary Teets, I will spend my time with you. I agree with your written statement on Global Positioning Systems, satellite navigational systems, when you said it gives our warfighters a decisive advantage.

This has been true to an extent in civilian aviation, that a lot of pilots have ignored other resources that are there or forgotten how to use them, I suspect. I have been told by some people in the Air Force that this same thing is true with them. My personal experience was flying an airplane around the world and never losing a satellite. That was 10 years ago. So I have a great appreciation for it, but I also know the dependence we have on it.

So it gets to the issue of jamming. How confident are you right now that, if you get into something more sophisticated than al Qaeda and the Taliban, do you agree that locating some kind of a jamming system or anti-jamming system is something that we need to really proceed on rapidly?

General EBERHART. Yes, sir. We have a program called NAVWAR, which stands for Navigational Warfare, that talks about the way ahead in terms of ensuring that people cannot deny us the use of this GPS that, as you have said, we have become so reliant on. So we have to do two things in my view. We have to be able to burn through the jamming, so we have to develop the capability to burn through the jamming; and second, we have to identify the source of the jamming so we can take it out.

Senator INHOFE. Timing-wise, though, it just seems that I have talked to some people in DOD that do not seem to be in as big a rush for this, and I think you have expressed a sense of urgency, too. When do you think we can have something that will work?

General EBERHART. Sir, I believe that on the current path we will have some capability in this area in terms of burn-through in about 2010. A full-up capability will be a little bit later than that, depending on if it is 10 dB or 20 dB.

Senator INHOFE. Thank you.

Secretary Wolfowitz said, "the program we inherited"—talking about ballistic missile defense—"was designed not for maximum effectiveness, but to remain within the constraints of the ABM Treaty. As a result, development and testing of programs for defense against long-range threats were limited to ground-based components, ignoring sea, space, and so forth."

Since we are going to be out of the treaty on June 13, are you satisfied with the pace that we will have once we can start aiming at space-based missile defenses and be able to get there?

General EBERHART. Sir, I must admit that I was very disappointed in terms of what happened to the space-based laser program in last year's deliberations, which I think will set back the space capability quite some time. I believe that we need to resurrect that capability once we all agree on what the requirements are and the way ahead.

But in terms of doing this from space, if we are not pursuing a space-based laser program then we are not getting any closer.

Senator INHOFE. What this leads to, of course, is your views on the growing likelihood of a rogue nation attack or of blackmail of the U.S. using ballistic missiles. We had a hearing the other day with George Tenet, the Director of Central Intelligence, and Admiral Wilson, the Director of the Defense Intelligence Agency. They talked about the National Intelligence Estimate, the current one that says: "As outlined in our recent National Intelligence Estimate, most intelligence community agencies project that by 2015 the U.S. most likely will face an ICBM threat from North Korea and Iran and possibly Iraq."

Well, turning that around, it is implying that that threat is not there until 2015. I was trying to get this question asked at that last hearing, but my time expired. In fact, I went quite a bit over my time. I remember so well what happened on August 31, 1998, when, much to our surprise, they did fire from North Korea a Taepo Dong I missile that actually had three stages. The third stage was a defective stage, but nonetheless it had the capability or would have had the capability of reaching orbit and, even with the defective stage, would have reached Alaska.

Now, that happened almost 4 years ago. How do they justify talking about 2015 when that demonstration took place 3½ years ago?

General EBERHART. Sir, I am not in a position to say what George Tenet had on his mind when he gave this date. I think it was probably a collective date for those countries. Without getting into a specific date, I can tell you that I am concerned about North Korea, specifically for the reasons that you have outlined.

I am also concerned because, as we know, their testing and deployment schedules are not usually consistent with what you and I would do in terms of probability of success. Sometimes they will deploy a system when it has not enjoyed the same success that we would want to see in this country.

So I do believe that North Korea could have that capability much before 2015, without getting into a specific date.

Senator INHOFE. That is my feeling, too. Of course, it is the Space Command's responsibility to be able to be prepared when that time comes. This has been something that has bothered a lot of us who have read some of these estimates. I think the National Intelligence Estimate of 1995 was certainly flawed in my opinion, and I think it has now proven, looking back, that it was not that accurate.

I thank you for that answer.

Thank you, Mr. Chairman.

Senator REED. Thank you, Senator Inhofe.

Senator Nelson of Florida.

Senator BILL NELSON. It is good to see both of you. Of course, I think that you are doing the Lord's work, and so I would like to pick up from my colleague from Nebraska and ask you, if we had a pot of money and it were available, where would you put significant improvement and increase to this existing budget. You mentioned the Space-Based Laser, that you were disappointed that it was cut. Both of you, if you would respond to that.

Secretary TEETS. I think there is strong reason to want to push forth some R&D aggressively in the field of space control. I for one am an advocate of wanting to see us move faster than we currently are on track to do. I would think that is an area for pursuing with some vigor.

I would say—and I fully recognize now, though, that all of these budget considerations get into the matter of priorities and judgmental factors. I do know that the fiscal year 2003 budget, the President's budget that we have submitted, does call for significant increases in the amount of resources that we are requesting be spent on space. I think we have done a reasonable job of sorting through those requirements.

We will be, as you probably know, requesting funds to start a space-based radar system, and space-based radar system will be focused on the need for providing ground mobile target indications to warfighting equipment and do it in a way that, if other assets for identifying mobile targets are denied to us, we will have an overhead system that can do it. So I do think it is a high priority for us to properly start to develop this space-based radar system.

We also will be requesting or having requested in the 2003 budget resources for what we would call a Transformational Communications System. This is going to be an aggressive system that will hopefully give us the capability to essentially remove communication bandwidth constraints from the warfighter and ultimately be able to field a communications system that can provide necessary information and intelligence and communications capability to all of our warfighters where they need it.

Senator BILL NELSON. So that each of them can talk to each other?

Secretary TEETS. Each of them can talk to each other and they can provide, I will say, first-rate information, visual as well as voice, into the cockpit of an airplane and get it straight to the warfighter.

We are in the process right now, the National Security Space Architect is running this Transformational Communications System study. We have participation, by the way, from the Navy, Army, Marine Corps, NRO, and NASA, as a matter of fact. NASA's requirements are playing into this Transformational Communications Architecture.

What we hope to do is be able to build a system which will provide for truly joint warfighter operations and provide information to all elements of the warfighting activity where needed, and in a very timely way.

Senator BILL NELSON. General.

General EBERHART. Sir, if you will allow us to be partners here, if the Secretary is going to spend his money that way, I will complete the board here and I will make sure that SBIRS is properly funded. I also would advocate that we start taking some significant steps in terms of developing a RLV program. We are going through a study with NASA right now in terms of the way ahead. From what we have seen right now it looks very promising to leverage NASA's SLI, their Space Launch Initiative, and to come up with almost a JSF-type arrangement, where we can use common technology, common parts, so that we can develop a reasonable launch vehicle that would have utility for NASA and the military.

But if you only gave me $1 to spend, I want to be very clear, I would spend it on the wonderful men and women out there serving day in and day out.

Senator BILL NELSON. General, I am glad you brought up the follow-on man-rated launch vehicle, because we have had so many starts and stops on that. Right now in the NASA budget over the next 5 years there is a $5 billion program for developing the technologies for whatever this new launch vehicle is going to be. Of course, what happens is the space shuttle just keeps getting stretched out and out and we are really looking, practically speaking, for another 15 years on the shuttle.

Can you tell me some more about the joint cooperation and participation, since such a reusable vehicle would clearly be something that the Department of Defense would have need of as well as NASA? Is that cooperation there and is there a consideration on joint funding so that NASA does not have to bear the full cost of the development of the technologies with NASA's little budget compared to the DOD budget?

General EBERHART. Sir, we have been looking at this now almost a year because initially what spurred us was the fate of the X series that was being pursued by NASA. As we got together collectively and looked at if there was any military utility in any of those vehicles to try to keep those alive, we decided that essentially we had wrung out all we could in terms of lessons learned, technology, et cetera, and it was time to start afresh, if you will, with those lessons learned.

As we look at this 120-day study, I think our goal is clearly to do just what you say: first and foremost, to be good stewards of the taxpayers' dollars and to see where we can better leverage the dollars available. I think as a result we will field a capability eventually that would be much cheaper than if we pursued it individually.

So in general terms, that is exactly where we are headed. The devil is in the details and there is a lot more work to be done here, but at least we have decided that this is the right thing to do.

Senator BILL NELSON. Mr. Chairman, my time has expired. I just want to say this as a parting statement in corroboration of the General's statement: It is very important to this country that we have a workable and efficient follow-on, man-rated vehicle to the shuttle at such time that it can be developed. What I would not want to see is this Nation penalized by not developing it because it is being developed out of a small budget of NASA, when in fact the need is so much greater than that.

The fact is that NASA is trying to get 10 pounds of potatoes in a 5 pound potato sack and it cannot do everything it has to try to do. I think there is going to have to be some direct major participation by the Department of Defense in funding of this replacement vehicle for the future.

Thank you, Mr. Chairman.

Senator REED. Thank you, Senator Nelson.

Secretary Teets, I am encouraged by your comments indicating your intention to cooperate with OSD and to work closely with Secretary Aldridge particularly. Let me ask two specific questions along this line.

There are numerous reviews required both by regulation and by statute, including the integrated product team reviews and defense acquisition executive summary reviews. Will space programs continue to be subject to reviews by the Office of Secretary of Defense using the existing review process?

Secretary TEETS. No. I think that there are changes afoot in that acquisition process as it relates to space programs. When I say changes afoot, what I mean is that we are in the process of trying to outline a defense space acquisition board activity which can operate on a compressed time scale, time frame, from today's defense acquisition board timeframe.

I think there are characteristic differences in space programs from most major defense programs that warrant some special considerations. One of the things that we are going to try to implement is, and we are going to try it first as essentially a pathfinder with GPS III this spring and summer, a way to have—instead of sequential review, we are going to have review in parallel.

We are going to have stakeholders sit at the same table and review the current status of the acquisition program or the plan as it may well be and make decisions in a much faster way. So as I mentioned before, rather than having a major milestone requirement a 6-month or more period of time from the start of the time until the acquisition decision can be made, we are going to try and compress that to something more on the order of a 3-month period of time.

We are going to try and accelerate independent cost estimates. We are going to try and use a database that, very frankly, has been built up by the NRO over the years for cost estimating in space programs, sophisticated space programs, and be able to bring that to the table in a way that we can see the necessary oversight activities happening, but do it quicker.

In all of that activity, though, we will be asking for representation from OSD, from Secretary Aldridge's operation, and also from John Stenbit's operation. So we are not trying to exclude them. We are trying to involve them. But we are not wanting to do it in series or sequential review. We want to try and do this in a parallel fashion.

Senator REED. Thank you, Mr. Secretary. Obviously, we would be very interested in the details of this new approach, and particularly if there are any type of statutory issues raised in your proposed new approach to the acquisition process.

Secretary TEETS. Yes, Mr. Chairman. It is modeled on something that is called NRO Directive 7, that has been in use for a while. I would be pleased to provide you with some of those details.

Senator REED. Thank you. Thank you very much, Mr. Secretary.

Mr. Secretary, one other question, which is, on February 14 Secretary Aldridge delegated milestone decision authority for DOD space systems to you. This gives you a great deal of discretion to waive certain requirements or to make judgments about whether they have been accomplished. I understand there may now be a proposal in the Pentagon to take back this discretionary authority, back to Secretary Aldridge. Could you give us a sense of the current status of this authority?

Secretary TEETS. Yes. I believe that the paperwork has been completed that does in fact designate the Air Force as DOD's executive agent for space, and in turn the Secretary of the Air Force has delegated that responsibility for space programs to me. So I believe that I am currently the DOD executive agent for space with milestone decision authority.

There are a number of other recommendations coming out of the Space Commission that are in progress. For example, the assignment of the national security space architect to my organization is in progress, but I have not seen that formal piece of paper signed yet. I have created an organization that has a national security integration directorate and it is in place. We had some time ago moved the Space and Missiles Center Command away from Air Force Material Command to Air Force Space Command. As a result, General Arnold reports now directly into General Eberhart as Air Force Space Command CINC.

In addition to that, you probably have seen that General Lord has been named as the next Air Force Space Command Commander in Chief as a four-star appointment. That change of command will take place some time in the spring.

So implementation of all of the National Security Space Commission recommendations are in work and we are moving out aggressively on them.

Senator REED. The September 14 memo stands, then, as the main directive?

Secretary TEETS. When you say "the September 14 memo," I am sorry, sir, but I am not that familiar with a September 14 memo.

Senator REED. In that case, Mr. Secretary, we will clarify it by placing it in the record.

[The information referred to follows:]

THE UNDER SECRETARY OF DEFENSE

3010 DEFENSE PENTAGON
WASHINGTON, DC 20301-3010

ACQUISITION, TECHNOLOGY AND LOGISTICS

FEB 14 2002

MEMORANDUM FOR THE SECRETARIES OF THE MILITARY DEPARTMENTS
UNDER SECRETARY OF DEFENSE (COMPTROLLER)
ASSISTANT SECRETARY OF DEFENSE (C3I)
UNDER SECRETARY OF THE AIR FORCE/DIRECTOR, NATIONAL RECONNAISSANCE OFFICE

SUBJECT: Delegation of Milestone Decision Authority for DoD Space Systems

The Secretary of the Air Force is hereby delegated Milestone Decision Authority (MDA) for all DoD Space Major Defense Acquisition Programs. The term Major Defense Acquisition Program (MDAP) is defined by 10 USC §2430. This authority may be redelegated, but only to the Under Secretary of the Air Force. This delegation is effective immediately and does not apply to highly sensitive classified programs, as defined by 10 USC §2430.

Execution of the acquisition process for DoD Space programs shall follow best practices and evolutionary acquisition principles and be conducted in compliance with applicable statutes and with the DoDD 5000.1, DoDI 5000.2, and DoD 5000.2-R. The Secretary of the Air Force, in coordination with the Secretaries of the Army and the Navy, may implement further actions with regard to space acquisition streamlining. For space MDAP's, the MDA is authorized to approve waivers and exceptions to the provisions of DoD instructions and publications, as defined by DoD Directive 5025.1, but only to the extent that the instruction or publication, and its subject matter, are under the jurisdiction of the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)). DoD 5025.1-I, "DoD Directives System Annual Index," provides some guidance on responsibilities and points of contact for specific DoD Directives and publications. Waivers and exceptions to the provisions of directives must be approved by the Secretary or Deputy Secretary of Defense. The USD(AT&L) will be advised of all waivers and exceptions granted. The OSD Cost Analysis Improvement Group (CAIG) will prepare independent cost estimates for ACAT I space programs.

Additionally, the Air Force is directed to complete the ongoing efforts on the Global Positioning System III (GPS-III) program that has been proposed as an acquisition process "pathfinder" for space systems. The Secretary of the Air Force should report the results of the "pathfinder" acquisition process (including documentation of DoD-wide "lessons learned") and the results of the Air Force/National Reconnaissance Office "Best Practices" review, with regard to further space acquisition streamlining not later than 60 days after completion of each effort.

E.C. Aldridge, Jr.

Secretary TEETS. OK. I thank you, Mr. Chairman.

Senator REED. Thank you.

Senator Allard.

Senator ALLARD. Mr. Chairman, I just have one remaining question. I understand we are not too far away from the vote, about 4 o'clock or so.

Senator REED. 4 o'clock.

Senator ALLARD. In the Defense Authorization Act last year, we established a new space career field, which included development of space doctrine and concepts of operations in space and develop-

ment and operation of space systems. I am interested to know what the status of this effort is and when will we see the implementation instructions for the career field. Maybe both of you could respond? General Eberhart?

General EBERHART. To be very candid, that is all a work in progress, Senator Allard. We are committed to this in terms of space doctrine, since we have published our space doctrine. At Air Force right now, the joint doctrine is under review. So since the subcommittee looked at that, the Air Force has published, I think, some very worthwhile and useful space doctrine.

Second, we have worked hard to operationalize and normalize the operation of the command and control of our space assets and our space capabilities. We do this predominantly through an air and space operations center out at Vandenberg Air Force Base, where SPACEAF, Space Air Forces, is assigned, now under the command of Major General Looney.

In terms of developing space professionals, we have been working this very hard. We have been working this with all the stakeholders in the room. It is very important that we not only address officers, but also address the very important enlisted and civilian members of our team.

Also, as the Secretary has indicated, we focus predominantly upon development of Air Force space professionals, but we also have to make sure that there is some consistency there as we look at space professionals in other Services. We in the Air Force have decided essentially that the Space Commission is right, the Authorization Act is obviously correct, and that we need to focus our efforts and truly ensure we have the space professionals obviously with the space expertise we need here in this new century.

So I guess to draw an analogy, we have been looking at both the Nuclear Navy, the Rickover Navy model, and also what we have been doing for decades in terms of developing our pilot force in terms of periodic upgrades, periodic education, periodic training, and spending more time in that career area than any other area as you progress through the ranks.

So as the Secretary mentioned, this was a topic of the most recent senior-level meeting that we had with the Secretary, the Chief of Staff, all four-star commanders, the Under Secretary, and all Assistant Secretaries of the Air Force. Everybody was committed. Now, there will be some dollars involved with this because we are developing syllabuses to make sure that we have the right training. Again, this is training over a career. You are trained once at a basic level, then you go back for graduate training, if you will, as you progress through the ranks.

I think that we have the concept now. We are putting it on paper. We will soon brief it through the executive agent for space and then to the Secretary of Defense. But I think everyone agrees that we are headed in the right direction here and we are committed to that.

Senator ALLARD. Secretary Teets, do you want to comment on that?

Secretary TEETS. I think General Eberhart covered it extremely well. I can tell you that Secretary Roche, I, and Secretary Rumsfeld are strongly committed to making certain that we develop this

cadre of talent across not just the Air Force, but across all Services as well. I think, frankly, some of the expertise that has developed over the years in the NRO can be brought to bear in a helpful way here.

Senator ALLARD. Mr. Chairman, I thought of another question just briefly. What is the relationship between George Tenet and the Secretary of Defense? Do we have a good relationship there?

Secretary TEETS. We have an excellent relationship there. The two speak frequently.

Senator ALLARD. Do they have breakfast occasionally?

Secretary TEETS. I believe so, indeed.

Senator ALLARD. Very good.

Thank you.

Senator REED. Thank you, Senator Allard.

Just for the information of my colleagues, the vote is scheduled at 4:25 on final passage of the Campaign Finance Reform Bill. I recognize Senator Nelson of Nebraska. We should be able to conclude this round and introduce our second panel before the vote.

Senator Nelson.

Senator BEN NELSON. I will forego a question at this time. Thank you.

Senator REED. Senator Nelson of Florida.

Senator BILL NELSON. Secretary Teets, you spoke earlier about the explosion of commercial imagery. Is part of that enhanced capability of commercial imagery, is that in China and India, and what kind of problem does that pose for us?

Secretary TEETS. Commercial imagery availability is worldwide, if that is what you mean. Now, there are two U.S. companies. There is a French company. There is an Israeli company. They are all engaged in commercial imagery. If you want to buy a satellite image of some place in China, you certainly can do so. You give them the coordinates and you will get a satellite image back.

Now, there are questions as to its operational use that need to be worked through. Timeliness is an issue. If you are going to actually depend on this kind of imagery for warfighting purposes, you need it on a very short time scale and you need it deliverable to the right set of people. So I do think timeliness is an issue as it relates to commercial imagery.

But clearly it is worldwide coverage and those images are available.

Senator BILL NELSON. With the foreign companies, such as the French that you mentioned, how quickly can two nations, for example that are now facing each other at the Kashmir border, obtain imagery so that they know what the other side is doing?

Secretary TEETS. I do not want to say that I have looked into this situation to the extent that I can give you a precise answer, but I would say to you that if the price were right, the physics are such that it could be delivered soon. I mean, you could redirect, recommand a satellite. If the weather is good, you could get an image of that border within a matter of hours.

Senator BILL NELSON. Now, one of the priorities for future funding you mentioned was the Space-Based Radar.

Secretary TEETS. Yes.

Senator BILL NELSON. Tell us some more about that. That would allow you to know what is going on regardless of the cloud cover, is that correct?

Secretary TEETS. Yes. The Space-Based Radar that we are talking about initiating a program for, is really intended to provide ground mobile target indications. That is its primary function. Its primary function is not as an imaging synthetic aperture radar (SAR). So what this system will be able to do will be to provide these ground mobile target indications so that if you have something on the ground that is moving you can identify it with GPS coordinates and take rapid action against it.

This Space-Based Radar that I am referring to is not so much an intelligence collection device as it is a warfighters' targeting system.

Senator BILL NELSON. Tell us some more about these microsatellites?

Secretary TEETS. I would turn to General Eberhart for that, because it is a concept that I read a little bit about, but I know General Eberhart has looked at it.

General EBERHART. Sir, we have several pilot programs over the next 2 years where we will do microsatellite work, sort of proof of concept. One will be fairly short-lived orbit and be later this year. Another one will stay up there for a while longer as we demonstrate the capability to allow this microsatellite to do a variety of things: first of all, to show the ability to have a very robust constellation, so therefore it would be difficult from a space control vantage point to knock out. Second, that you can use these satellites possibly, depending on how you control them, for on-orbit maintenance, if you will. You could use these satellites for on-orbit escort.

You are limited only by your imagination here in terms of how you could use these satellites. Obviously, the cost to get them on orbit, the cost of the satellite, is reduced based on the size that we are talking about. You could put many in orbit with the same launch. So I think that there is exciting opportunities here that we will better understand after we do our first couple of proof of concept demonstrations.

Senator BILL NELSON. These microsatellites could be at any altitude?

General EBERHART. I guess they could, sir, but I think initially more the LEO and the GEO type orbits is what we would be talking.

Senator BILL NELSON. You said GEO?

General EBERHART. Yes, sir.

Senator BILL NELSON. Thank you, Mr. Chairman.

Senator REED. Thank you very much, Senator Nelson.

Thank you, Mr. Secretary, General, for your excellent testimony, and we will excuse you and ask the second panel to come forward. Thank you very much. [Pause.]

We will resume the hearing. Welcome, Admiral Ellis. Good to see you again.

Admiral ELLIS. Thank you, sir.

Senator REED. General Blaisdell and Admiral Dwyer, thank you for being with us this afternoon. We look forward to hearing from

each of you today. Admiral Ellis, now that the Nuclear Posture Review has been completed, we would like to hear from you as to the next steps the Department of Defense will take as a result of the Nuclear Posture Review. We especially want to know how this policy document gets translated into meaningful guidance for you as you execute the duties of your command.

Major General Blaisdell, you have begun to retire the Peacekeeper missile and have a number of modernization programs under way. We would like to discuss these issues as well as other areas of concern to you.

Admiral Dwyer, my congratulations to you on the 95th successful Trident II missile test in a row. Fortunately, the Navy football team is not as proficient. Now that the Navy has determined that it will rely on 14 Trident submarines that will last 44 years with one refueling, we would like to hear about plans to implement this approach with respect to the Trident II missile program.

I would like to recognize Senator Allard if he has a comment at this time.

Senator ALLARD. Mr. Chairman, I do not have any comments now, but if they get proficient at football what happens to West Point?

Senator REED. We have to come up with an even more destructive system. [Laughter.]

Senator ALLARD. Better thank your lucky stars.

Senator REED. I guess if they apply their energy to Trident submarine that is fine, that is okay. But football is something else.

Senator ALLARD. Senator Nelson likes to bet.

Senator REED. We do not play Nebraska.

Senator ALLARD. Thank goodness.

Senator REED. Thank goodness, that is right.

Admiral Ellis, I note that you have submitted an opening statement on behalf of the panel and it will be included in the record. Please go ahead.

STATEMENT OF ADM. JAMES O. ELLIS, JR., USN, COMMANDER IN CHIEF, UNITED STATES STRATEGIC COMMAND

Admiral ELLIS. Thank you, sir. Mr. Chairman, Senator Allard, Senator Nelson, I am honored to appear once again before you today to address the posture of the United States Strategic Command. I am also pleased, as you have noted, to have with me today Major General Blaisdell, who is the Director of Nuclear and Counterproliferation on the Air Force Staff, and Rear Admiral Dwyer, who is Director of the Navy Strategic Systems Program.

Thanks to their efforts and your continued support, I am proud to report that our Nation's strategic forces remain ready. As they have been for the past 56 years, they are manned by true professionals who stand ready with the Nation's ultimate deterrence against major military attack on the United States and its allies, while also serving in new roles reflective of a dramatically changed set of national security challenges.

I am pleased with the increased focus on and resources being invested in our strategic capabilities, particularly as a result of the recently completed Nuclear Posture Review. More than a much-needed capabilities assessment, the NPR brings increased empha-

sis to ensure our streamlined strategic forces, weapons, infrastructure, communications, intelligence, and planning receive the resources required to ensure their effectiveness and in many cases extend them well beyond their original design life.

We are reshaping our national strategic capability in response to a dramatically changed international environment. We will integrate improved strategic strike forces, both nuclear and conventional, active and passive defenses, and a renewed and responsive infrastructure. This so-called new triad will be enabled by improved command and control systems as well as robust, adaptive, and responsive intelligence and planning capabilities.

To become a reality, this effort will require sustained support from the Services and, of course, from you and your colleagues. Success in this effort will allow us to continue to reduce the Nation's reliance on nuclear weapons and enable us to confidently meet the President's goal of 2,200 to 1,700 operationally deployed strategic nuclear weapons by 2012.

As the joint commander of the Nation's strategic forces, my focus has been on working with the Department of Defense and the Services, particularly the Navy and the Air Force, on ensuring this year's budget and the Future Years Defense Program provides the support necessary to meet the requirements for our new strategic capabilities. For fiscal year 2003, the President's budget funds the highest priorities for our strategic forces and for capabilities supporting these forces. Increased funding has also been directed towards infrastructure, defenses, and development of new supporting capabilities.

My most pressing concern for the strategic forces is modernizing and sustaining an aging force structure, including our delivery platforms, their weapons systems, and warheads. From the venerable B–52 bomber to the newest Trident missile submarines, each platform and weapons system has a scheduled life extension program designed to keep it in service for at least the next 20 years. Some will be expected to serve well beyond that time.

In addition to modernizing existing systems, we must also improve our strategic capability through modernizing and developing new supporting capabilities. These capabilities include our command, control, communications, computers, intelligence, surveillance, and reconnaissance (C^4ISR) capabilities, our war-planning systems and processes, and our nuclear weapons infrastructure.

We are also pursuing new strategic capabilities in conventional strike, non-kinetic options, and advanced intelligence. The Nation is also developing missile defenses as an integral element of our strategic capability.

As always, our people will continue to be the foundation of our military success. I appreciate your continued efforts to improve the quality of life for our military and their families as well as our civilian professionals.

All of these issues and concerns are interrelated. Together, the sustained investment in our people and in our existing systems and in developing broad new non-nuclear strategic capabilities are required to realize the President's goal of reducing our operationally deployed strategic nuclear weapons to the lowest levels consistent

with our national security. I am firmly committed to reaching that goal with your continued support.

[The prepared statement of Admiral Ellis follows:]

PREPARED STATEMENT BY ADM. JAMES O. ELLIS, USN

Mr. Chairman, Senator Allard, distinguished members of the subcommittee:

It is an honor to appear before you representing the outstanding men and women of United States Strategic Command. I appeared before the full Senate Armed Services Committee to discuss the policy issues associated with the Nuclear Posture Review, and I welcome this opportunity to address the Strategic Subcommittee on the programmatics and requirements supporting my command's posture.

I appear before you today to report that our Nation's strategic forces are ready. As they have been for the past 56 years, they are manned by true professionals, trained and ready to respond when called, yet hopeful that our efforts of dissuasion and deterrence prevail to prevent military attacks against the United States and our allies. Nonetheless, the renewed focus on supporting and modernizing aging strategic systems and infrastructure must be sustained to ensure our forces remain a ready, reliable, and credible element of our Nation's security posture. Thank you for your sustained support of our strategic forces and your commitment to a safe, reliable, and secure nuclear weapons stockpile.

EVOLUTION OF STRATEGIC POLICY

Since the end of World War II, the United States has had forces postured to conduct long-range strategic operations in support of our national defense. The creation of Strategic Air Command in 1946 integrated the impressive conventional long-range strike capabilities developed during World War II with the emergent capabilities of nuclear weapons. As the Cold War developed and simmered, our strategic forces assumed a decidedly nuclear focus in order to deter the imposing threat of nuclear war with the Soviet Union and her allies. The enormous responsibility of safeguarding, maintaining, and, if needed, employing nuclear weapons demanded a culture of rigorous discipline and professional excellence that continues to this day both in our strategic task forces and in our headquarters.

With the development of both land-based and sea-based ballistic missiles capable of delivering nuclear payloads, our war planning process, already complex to support our strategic aviation forces, required significant improvements in capability to ensure the triad of sea, air, and land forces could be effectively employed in support of our national defense. At the same time, we realized the strategic mission required joint cooperation for effective integration. That was achieved through the Joint Strategic Target Planning Staff which, in 1960, effectively formed the first joint organization with global responsibilities. Strategic Air Command and the Joint Strategic Target Planning Staff served the Nation well during the Cold War. Today's culture of excellence, complex weapons, and our existing triad of operating forces that make up U.S. Strategic Command were all forged during that period.

The end of the Cold War provided an imperative to reevaluate the organization and focus of our strategic forces. In 1992, our nuclear forces were integrated under one Combatant Commander charged with planning and, if directed by the President, executing our Nation's strategic warplans. What had been a large element of our national strategy during the Cold War, became a more streamlined, and focused, but still essential element of our national strategy. Forces allocated to U.S. Strategic Command now represent less than 3 percent of all DOD personnel and expend less than 3 percent of the DOD's total obligational authority.

The mission of our Nation's strategic forces over the last 56 years has been enduring: to deter a major military attack on the United States and if necessary employ strategic forces to defeat any adversary. While that specific purpose is unchanged, our methods of meeting that mission have changed dramatically.

During the Cold War, we fielded increasingly complex weapons focused on a specific group of states, the Soviet Union, and its allies. Our war plans were developed to counter these states and the threat they represented. Today, the Soviet Union no longer exists. None of its successor states are considered our enemy. Yet, the specter of a major attack using weapons of mass destruction remains and is growing more complex. The key difference between the international environment today and the environment during the Cold War is that the United States cannot predict with confidence what nation, combination of nations, or non-state actors may pose a threat to our vital interests or those of our friends and allies decades from now. As a result, our war plans and operating forces must be postured to assure our allies,

dissuade potential enemies, deter those countries that threaten us, and, with Presidential direction, defend our Nation and defeat those that may choose to attack us.

THE NUCLEAR POSTURE REVIEW

As I noted in my testimony before you last month, I welcome the results of the Nuclear Posture Review. More than a much needed capabilities assessment, it brings increased focus to ensure all our strategic forces, weapons, infrastructure, communications, intelligence, and planning receive the resources required to enhance their capabilities and, in many cases, extend them well beyond their original design life. Over the next decade, our national strategic capability will integrate improved strategic strike forces, both nuclear and conventional, active and passive defenses, and a renewed and responsive infrastructure. This new triad will be enabled by improved command and control systems as well as robust, adaptive, and responsive intelligence and planning capabilities.

To become a reality, this new triad will require sustained support by the Services and Congress. Success in this effort will allow us to continue to reduce the Nation's reliance on nuclear weapons and enable us to meet the President's goal of 2,200–1,700 operationally deployed strategic nuclear weapons by 2012. For fiscal year 2003, the President's budget includes increased funding to cover the highest priorities for our strategic forces and for capabilities supporting these forces. Increased funding has also been directed towards infrastructure, defenses, and development of new capabilities. Taken together, these funding increases put us on the path of refocused strategic capability and the lowest number of nuclear weapons consistent with our national security.

STRATEGIC FORCE STRUCTURE

To address a broad range of threats, our Nation's security rests on several factors, particularly on our demonstrated will and capability to uphold our security commitments when they are challenged. Our declaratory policy communicates costs to potential adversaries. Our warfighting capability, including a robust triad of strategic forces, conveys credibility across the full spectrum of conflict—conventional to nuclear. The Nuclear Posture Review reaffirmed the wisdom of preserving the complementary strategic triad of land-based intercontinental ballistic missiles, submarine-launched ballistic missiles, and strategic bombers as the backbone of our strategic strike forces.

Each leg of the Nation's offensive strike forces possesses unique attributes that enhance deterrence and reduce risk. Intercontinental ballistic missiles (ICBMs) provide prompt response; strategic submarines (SSBNs) provide survivability; and bombers provide flexibility. The diversity of our strategic forces and the synergy created by these attributes are designed to complicate any adversary's offensive and defensive planning calculations while simultaneously providing protection against the failure of a single leg of the triad.

Intercontinental ballistic missiles continue to provide a reliable, low cost, prompt response capability with a high readiness rate. They also promote stability by ensuring that a potential adversary takes their geographically dispersed capabilities into account if contemplating a disarming first strike. Without a capable ICBM force, the prospect of destroying a significant percentage of America's strategic infrastructure with a handful of weapons might be tempting to a potential adversary in a crisis.

Ballistic missile submarines continue to carry the largest portion of our strategic strike force. With approximately two-thirds of the force at sea at any one time, the strategic submarine force is the most survivable leg of the triad, providing the United States with a powerful, assured response capability against any adversary. Submarines at sea are inherently survivable and hence stabilizing. Submarines in port, however, are more vulnerable and could offer an extremely lucrative target in crisis. Thus, in any foreseeable force structure, the United States must preserve a sufficiently large strategic nuclear submarine force to enable two-ocean operations with sufficient assets to ensure an at-sea response force capable of deterring any adversary in a crisis.

Strategic bombers are the most flexible element of our strategic strike forces. The "man in the loop" allows force dispersal to improve survivability and aircraft recall during mission execution. The low-observable technology of the B–2 bomber enables it to penetrate heavily defended areas and hold high-value targets at risk deep inside an adversary's territory. In contrast, the B–52 bomber can be employed in a standoff role using long-range cruise missiles to attack from outside enemy air defenses. This mixed bomber force can generate to alert status when necessary to deter escalation or provide assured response should deterrence fail.

In accordance with the Nuclear Posture Review our strategic forces are proceeding to the following levels:

- 500 Minuteman III ICBMs
- 14 Trident SSBNs equipped with Trident II (D–5) missiles
- 76 B–52 and 21 B–2 bombers

In addition, the Nuclear Posture Review confirmed the plan to deactivate our 50 Peacekeeper ICBMs, eliminate the nuclear re-role requirement for the B–1 bomber, and remove four Trident SSBNs from strategic service.

With no new forces in development, this triad of strategic strike forces will remain the backbone of our Nation's strategic deterrent capability for at least the next 20 years. As such, we must ensure these forces remain robust, reliable, and secure.

STRATEGIC FORCE MODERNIZATION AND SUSTAINMENT

Today we have no new strategic systems under development. With the exception of the Trident II (D–5) missile, which is still in low-rate production, the United States has in-hand all of its major strategic systems. Therefore, as our Nation comes to rely on our existing strategic force, the imperative for modernizing and sustaining that force becomes even more critical. Since we must maintain these existing systems for at least the next 20 years, it is also crucial to sustain the industrial base that provides key components and systems unique to our strategic forces.

Sustainment and modernization of the strategic bomber force is critical to provide a force that can support our strategic strike requirements as well as the conventional needs of our regional Combatant Commanders. The B–52 is projected to remain the workhorse of our bombers through 2040. That will make it an 80-year-old aircraft when it is finally retired. Based on current trends, the critical focus for sustaining the B–52 is upgrading electronic components to ensure command and control capability and platform survivability in future conflicts. The Advanced EHF communications upgrade for the B–52 is vital to maintaining a capability across the spectrum of conflict and executing the flexible, adaptable plans necessary to address a wide range of threats. We cannot afford to slip this upgrade any further without adversely impacting combat capability when the UHF Milstar communications constellation begins to lose capability. In addition, we will need to monitor the impacts of unforeseen aging problems with the airframes themselves as we continue to use these venerable aircraft in the global war on terrorism.

The B–2 bomber is similarly projected to remain in service through 2040. While certainly a newer aircraft, the B–2 must also receive the same command and control capability as the B–52, allowing flexible targeting. This will require an Advanced EHF suite to ensure the capability for in-flight retargeting and recall in both nuclear and conventional roles.

U.S. Strategic Command relies heavily on air refueling forces to support both bomber and airborne command and control aircraft. We are facing similar challenges in sustaining the aging KC–135 aircraft which are committed to direct support of our strategic forces. I fully support the Air Force's continuing efforts to sustain these aircraft while pursuing a follow-on capability which will remain critical to our strategic mission.

Our ICBM force will undergo significant transition over the next decade. The Peacekeeper ICBM system is programmed for deactivation beginning in the first quarter of fiscal year 2003 and aggressively continuing over the following 3 years. This retirement program is fully funded in the President's budget and phased to meet our warfighting requirements while adhering to the highest standards of safety and security requirements. The Minuteman III missile system is also undergoing comprehensive inter-related modernization programs designed to extend its service life through 2020. The President's budget funds the guidance and propulsion replacement programs at procurement rates that ensure the overall readiness, reliability, and capability of our ICBM forces into the next decade. Equally important, the safety enhanced reentry vehicle program will allow us to use the Peacekeeper W87 warhead on the Minuteman III ICBM as the Peacekeeper leaves service. This modification enables us to retain the capability of one of our newest warheads with its modern safety and reliability features while retiring the W62, the oldest ICBM warhead in our inventory later in this decade.

Our ballistic missile submarine force is also in the midst of significant transition. The Navy is in the process of converting four of our older Trident ballistic missile submarines to carry the Trident II (D–5) missile system. This conversion will provide us with 14 D–5 equipped SSBNs while making 4 Trident I (C–4) missile equipped submarines available for conversion to cruise missile and special operations capable submarines. The program for D–5 conversions is fully funded and on track.

On a very positive note, our Trident submarines' hull lives have been extended from 30 to 44 years. Although the Navy must procure additional missiles and conduct a D–5 missile life extension program, this will ensure sufficient missiles are available throughout the Trident submarine service life. This program was fully funded in the President's budget, however, last year's $25 million reduction in the D–5 missile program budget will result in an overall $60 million cost associated with the shutdown and restart of three critical component production lines during fiscal year 2002. I am working with the Navy to address these impacts in their future years defense program for the D–5 missile.

In regards to our nuclear weapons, my overall assessment is that our stockpile is reliable and safe. I have concerns, shared by NNSA's John Gordon, that the stockpile is showing signs of aging, and manufacturing defects are being discovered which indicate that previous reliability assessments were optimistic. This is due, in part, to the success of the Stockpile Stewardship Program in expanding our knowledge of warhead performance through the development of improved surveillance, modeling, and simulation tools. This greater scientific understanding has enabled us to identify potential problems and uncertainties of which we were previously unaware. The ongoing refurbishment of the W87 warhead has marked an important technical milestone for stockpile stewardship, as it is the first major refurbishment of a nuclear warhead in a non-testing environment. Approval has also been given for several critical warhead life extension programs—the B61, the W76, and the W80. Together these four systems will comprise a significant portion of our country's enduring nuclear stockpile.

COMMAND, CONTROL, INTELLIGENCE, AND PLANNING SUSTAINMENT AND MODERNIZATION

Our command and control, as well as intelligence and planning capabilities, are essential "force multipliers" and serve to enhance and unify our forces. As we transition to the broader range of deterrent capabilities suggested by the Nuclear Posture Review, we must ensure new C^4ISR capabilities are available across the range of strategic options. Our current C^4ISR capabilities include a robust war planning capability, fixed and mobile command and control facilities, and a joint intelligence center. As with our other strategic forces, these systems must be modernized in terms of capabilities and capacity.

The security challenges of the next decade require that we become more flexible and adaptive in our shift from a specific state, or threat-based strategy, to a capabilities-based strategy. U.S. Strategic Command has begun development of a planning system that retains the rigor and expertise developed over the last several decades, yet employs modern computing techniques and streamlined processes to significantly improve our planning capability. This effort is a critical element in enabling rapid, flexible crisis response that integrates nuclear, conventional, and nonkinetic weapons into our war plans. This new approach to planning will require significantly more collaboration with the regional Combatant Commanders as we continue to better integrate our military capabilities across the spectrum of conflict. Our goal is to remove inefficiencies between current theater and strategic war planning development by eliminating seams and expanding available options for our senior leaders in future crises. This is a significant change and will be facilitated by a comprehensive review of our current war planning processes.

I am pleased with the increased attention given to the long-term modernization and sustainment of our two airborne command and control systems. The National Airborne Operations Center, the E–4, is operated by Strategic Command as an airborne element of the National Military Command System. As with most of our strategic forces, it requires sustainment and modernization investments into current capability while integrating new command, control, and communications requirements. Increased senior leader attention during the last year has resulted in significant improvements in E–4 modernization funding in the President's budget. This vital funding ensures these aircraft have the required capabilities to support our senior leadership in any future national crisis. Similarly, the E–6B airborne command and control aircraft modernization is funded by the fiscal year 2003 budget submission. The funding requested corrects demonstrated operational deficiencies impacting aircraft mission capability rates.

As the combatant commander of strategic forces, I am very interested in the replacements for our Defense Support Program (DSP) constellation and Milstar communications satellites. The successful fielding of these systems directly affects our strategic warning and communications requirements. The SBIRS-High capability is vital to our warning timelines and ability to execute our strategic forces when under attack. Similarly, the Advanced Extremely High Frequency satellite system is nec-

essary to ensure global, secure, survivable communications between our senior leadership and strategic forces. I understand the concern with the costs and schedule progress of both of these systems, however, the current DSP and Milstar systems have finite lifetimes, and we must preserve the requirement for replacement of these critical capabilities as they approach the end of their technological life. If current legacy satellite systems degrade significantly without replacements, we are seriously affecting the ability to capably respond with our strategic assets, as well as with all of our modern, networked military forces.

Our Strategic Joint Intelligence Center is tasked with a wide range of intelligence requirements supporting development of our strategic and theater war plans. It also supports all regional Combatant Commanders in the global war on terrorism through participation in a federated intelligence process, where we apply our imagery analysis expertise in such areas as weapons of mass destruction proliferation, hard and deeply buried targets, and battle damage assessment. I personally benefited from this expertise in 1999 as the commander of forces during Operation Allied Force and today I'm sure Central Command similarly appreciates their significant contribution to the ongoing campaign in Afghanistan.

As you may know, the current system of managing our intelligence information is reaching its maximum capability. This tasking, processing, exploitation, and dissemination (TPED) system is a limiting factor and has been previously identified as a problem area but still requires significant effort to correct. The President's budget includes funds to address this area. However, I believe an uncertainty still exists over the future years defense program to meet intelligence community requirements. This limitation will be exacerbated by the increased flow of intelligence information envisioned by emerging capabilities. Similarly, the intelligence information infrastructure is currently vulnerable to single-point failures. Now is the time to address these critical vulnerabilities as we expand our intelligence requirements against new threats. Given our military's growing reliance on network-centric warfare, we must keep pace in developing TPED systems if we are to prevent the fog of war from becoming digital.

I am very concerned about the future plan for equipment used to enable secure encrypted communications with not only our strategic forces and command and control aircraft but the entire military as well. Equipment used on our strategic forces will require replacement beginning in fiscal year 2005.

PREPARING FOR THE FUTURE

As we transition into the future, it is essential that we sustain, modernize, and enhance our existing strategic systems. The Quadrennial Defense Review and Nuclear Posture Review also direct investments in new capabilities that will support and enhance the national security elements of assure, dissuade, deter, defend, and defeat. Some of these investments include advanced strike capabilities, defenses, intelligence and planning capabilities, and command and control improvements.

The Department of Defense is pursuing advanced precision strike capability to support our combatant forces throughout the spectrum of conflict. Our strategic forces will take advantage of these capabilities to replace certain missions previously assigned solely to nuclear weapons and provide non-nuclear options to our senior leadership as well. I support these initiatives. I also support the focus and resources expended on ensuring our Nation's command and control systems are an enabler for our joint warfighters and not a constraint. General Myers, the Chairman of the Joint Chiefs of Staff, is leading the charge on developing joint C^4ISR that closes the gaps and seams between the combatant commands and the Service provided forces. In addition, I fully support Under Secretary Aldridge and Assistant Secretary Stenbit in their efforts to ensure that enduring national command and control requirements of global, secure, survivable communications are maintained in any future satellite architecture.

The challenges of hard and deeply buried targets, strategic relocatable or time critical targets, advanced conventional weapons employment, and offensive information operations targeting require a much greater fidelity in intelligence than we currently possess. There are no immediate solutions to these challenges. I fully endorse the DOD systems approach to address these requirements, since it is far more than just a hardware or resource issue. We need to comprehensively assess our intelligence capability from our hardware, to our people, organizations, and processes to ensure we develop a robust system that supports the full range of our Nation's warfighting capabilities.

DEPARTMENT OF ENERGY AND DEPARTMENT OF DEFENSE INFRASTRUCTURE

This year's Nuclear Posture Review officially recognized a responsive infrastructure as one of the critical elements of our strategic posture. The safety, surety, and reliability of our strategic nuclear arsenal depend heavily on the Department of Energy's (DOE) National Nuclear Security Administration (NNSA). Your continued support of NNSA is vital to ensuring they can support our strategic forces. They are making great strides in improving the nuclear weapons complex. As does John Gordon, I fully support current efforts to revitalize the laboratory and production infrastructure, and increase our nuclear test readiness.

Our nuclear weapons production complex has deteriorated to the point that significant investment is required in order to effectively refurbish our active stockpile. Without sustained investment in the NNSA infrastructure, we risk losing confidence in our nuclear stockpile and eliminate any possibility of accelerating retired warhead dismantlement. We must realize that a robust, agile, and flexible nuclear weapons complex—comprised of both infrastructure and talented people to research, design, develop, and manufacture or refurbish nuclear weapons as necessary—provides us with the ability to respond to a changing national security environment and is itself a deterrent which complements our military forces. To this end, the need for sustained support of NNSA's Stockpile Stewardship Program has never been greater.

The Stockpile Stewardship Program provides no concrete assurance against the need for a nuclear weapons test in the future. As General Gordon stated in his testimony to the full committee last month:

> "Over time, we believe that the stewardship program will provide the tools to ensure stockpile safety and reliability without nuclear testing. But there are no guarantees. It is only prudent to continue to hedge for the possibility that we may in the future uncover a safety or reliability problem in a warhead critical to the U.S. nuclear deterrent that could not be fixed without nuclear testing."

There is currently no need to conduct a test today, however, our current test readiness posture of 24 to 36 months does not provide for a timely and effective response to unexpected events, whether internal (related to problems with the stockpile) or external (related to foreign actions). Both the Nuclear Posture Review and the report of the fiscal year 2000 Panel to Assess the Reliability, Safety, and Security of the United States Nuclear Stockpile identified the need to improve test readiness. I fully support this effort.

A less visible, yet equally vital, element of a responsive strategic infrastructure is the industrial base supporting our strategic systems. One of the inevitable results of having no new development or production of strategic systems for almost 10 years is the decline of critical industrial capabilities unique to strategic systems such as hardened electronics, solid rocket motors, and reentry system technology. The President's budget includes funding for programs sustaining strategic systems technology and I appreciate your continued support in this area.

OUR PEOPLE

As General Myers stated in his testimony before the full committee, the success in all our missions depends on our number one asset—our people. Maintaining our culture of excellence at U.S. Strategic Command depends on recruiting and retaining the best and brightest. Working with nuclear weapons demands nothing less. I am grateful for the continued emphasis Congress and this administration have placed on raising the standard of living of our Service members and their families.

Strategic Command has always had a strong relationship with the Nation's Guard and Reserve personnel who support our strategic mission. The Guard and Reserve operate almost 75 percent of our designated tanker forces. In addition, we have 84 reservists recalled to active duty at our headquarters primarily supporting our dedicated efforts in support of the global war on terrorism.

FORCE PROTECTION

Our people have unique responsibilities for stewardship of our nuclear weapons. They are dedicated and devoted professionals who take very seriously the development of our strategic war plans and the safeguarding and security of the nuclear weapon systems that provide the deterrent force for our Nation. The events of September 11 only served to heighten our keen sense of awareness of our responsibility. Your committee has already received testimony from the Services and the National Nuclear Security Administration regarding ongoing efforts to increase our already high levels of nuclear weapons security. I appreciate your support of the President's

budget request to increase funding for additional security personnel and force protection initiatives for our task forces and the Department of Energy.

CONCLUSION

I assure you that Strategic Command is ready now and I am personally committed to sustaining that readiness into a challenging future. I am pleased with the current focus on and resourcing of our strategic forces. Continued attention in the Future Years Defense Program is required to address previous reductions in the Trident II (D–5) missile life extension program, funding replacements for encryption equipment, and fully funded upgrades to the intelligence TPED system.

Reshaping our strategic capabilities will require sustained support in the years ahead. As the Secretary of Defense stated in the foreword to the Nuclear Posture Review:

> "Constructing the new triad, reducing our deployed nuclear weapons, and increasing flexibility in our strategic posture has resource implications. It costs money to retire old weapons systems and create new capabilities. Restoring the defense infrastructure, developing and deploying strategic defenses, improving our command and control, intelligence, planning, and non-nuclear strike capabilities require new defense initiatives and investments. However, these investments can make the U.S. more secure while reducing our dependence on nuclear weapons."

I appreciate your continued support for the men and women of U.S. Strategic Command and the unique and essential contributions they make to our Nation's security. I look forward to reporting our progress to you in the future.

Thank you and I welcome your questions.

Senator REED. Thank you very much, Admiral Ellis.

General Blaisdell, do you have a comment, or Admiral Dwyer?

General BLAISDELL. It is a pleasure to be here, Mr. Chairman, again. I do not have an opening statement. I am here to support Admiral Ellis.

Senator REED. Thank you, sir.

Admiral Dwyer.

Admiral DWYER. Mr. Chairman, it is a pleasure to be here. I also note that you won this year.

Senator REED. You are already ahead of the game, Admiral.

Admiral DWYER. But I have no comments, sir.

Senator REED. Thank you very much, Admiral.

Let us proceed with a round of 6 minutes and if we have additional time before the vote perhaps ask individual questions as the case may warrant.

Admiral Ellis, as I indicated in my opening statement, the Nuclear Posture Review has been completed. Could you explain the process that follows the Nuclear Posture Review that will actually provide your command with the guidance it needs to develop target plans?

Admiral ELLIS. Yes, sir, certainly. I would be glad to. The Nuclear Posture Review was a congressionally-mandated review chartered or undertaken by the Secretary of Defense and he has submitted that report to Congress as directed. It is anticipated that that will be followed by presidential guidance, as Secretary of State Powell mentioned to you in the colloquy that you had before your Appropriations Committee subcommittee hearing. The President will make the decision on what elements of that are to be emphasized and provide his guidance in turn to the Secretary of Defense.

The Secretary of Defense then will add to that guidance with more specificity, provide it to the Chairman of the Joint Chiefs of Staff and, through him, to me for ultimate implementation in future planning efforts.

Senator REED. Admiral, I notice in the new triad, which is one of the marquee elements of the Nuclear Posture Review, that there are conventional forces. Does that mean that Strategic Command will be, in fact, conducting non-nuclear war planning as part of this new approach?

Admiral ELLIS. What that implies, sir, I think, is that we find that a new strategic concept of deterrence is appropriate. Such a concept has to be broadened beyond strategic equaling merely nuclear and a broader range of options and possibilities needs to be presented to the President and the rest of the Nation's leadership. That could and should include non-nuclear kinetic capabilities, the advanced conventional weapons, if you will, and even ultimately, if and when they deliver or are developed, non-kinetic capabilities.

So over the long term, over the next decade, I expect that that is a direction that we at Strategic Command will be going in the future.

Senator REED. Admiral Ellis, is there in your estimate a validated requirement for a new nuclear weapon?

Admiral ELLIS. No, sir, at this time there is no requirement for new design or creation of new nuclear weapons.

Senator REED. General Blaisdell, Admiral Dwyer, is that your view also?

General BLAISDELL. That is also my view. There is no new requirement for nuclear weapons.

Senator REED. Admiral Dwyer?

Admiral DWYER. That is our view. We are extending the life of our current warheads, Senator.

Senator REED. How would such a requirement be developed if in fact a new requirement would emerge? Admiral Ellis?

Admiral ELLIS. The established processes by which military requirements are generated and then options are reviewed by which those requirements could be met, would be the system by which that would come forward, sir. Clearly, that would involve the classic procurement processes and the appropriate levels of oversight and scrutiny during that effort.

Senator REED. Now, is there a validated requirement for providing new capabilities to an existing nuclear weapon? Admiral Ellis?

Admiral ELLIS. There are ongoing studies, as you are aware, Senator, to deal with a broadened and increased target set, particularly the hard and deeply buried targets which we have a proliferation of around the world. Advanced conventional weapons are certainly a part of that assessment, but a full spectrum of assessments is under way as to how that capability could be used or employed.

Clearly, there are no decisions. There are only studies under way, as you have been briefed, I think, by the Secretary and at the staff level.

Senator REED. General Blaisdell, Admiral Dwyer, do you have anything to add?

General BLAISDELL. On the Air Force side, in partnership with DOE, there is a Robust Nuclear Earth Penetrator (RNEP) program that I believe has been brought over to you, still a study program. It does use existing resources, and we are partnering with the Department of Energy in that effort.

Senator REED. Admiral Dwyer.

Admiral DWYER. Mr. Chairman, we are participating also in the studies with DOE and the Air Force.

Senator REED. Thank you.

General Blaisdell, as the Peacekeeper is retired the warhead from the Peacekeeper will be available for the Minuteman III ICBM. This will allow retirement of the older of the two Minuteman III warheads, the W–62. Does the Air Force have any plans to extend the life of the W–62?

General BLAISDELL. No, Mr. Chairman, we do not. It was decided not to extend the life of the W–62. So as the Mark 21 warheads which are on the Peacekeeper, as we proceed through Peacekeeper retirement we will store those and then start to take down the W–62 warheads and then replace those W–62s with the Mark 21s from Peacekeeper.

Senator REED. Does the Air Force have any continuing military requirement for the W–62?

General BLAISDELL. We do not at this time.

Senator REED. Thank you.

Let me ask you just a general question, General Blaisdell. Does the budget request fully support the Peacekeeper ICBM retirement program?

General BLAISDELL. Yes, sir, it does. We are fully funded as far as Peacekeeper, $4.9 million in 2002 and $537 million over a total program cost for Peacekeeper. So we are funded. We are prepared to take that down as we have indicated, 17, 17, and then 16, over 3 years, and then 2 years to clean up what is left of the program.

Senator REED. Thank you very much.

Senator Allard.

Senator ALLARD. Admiral Ellis, I am looking here at an article on March 16 from the *International Herald Tribune* and it prompted me to ask a question: Apparently there was at one point considerable concern expressed after the release of the Nuclear Posture Review that Russia might feel compelled to respond by sustaining a larger nuclear force than it would have otherwise.

How do you perceive the Russian reaction to the Nuclear Posture Review from your perspective and your contacts with Russian defense personnel?

Admiral ELLIS. Sir, I have not had contact with them since the release, or the leak, of the Nuclear Posture Review. But I can only draw on the public statements that have been made by the Russian authority, Minister Ivanov, who was in this country recently and appeared jointly with the Secretary of Defense in a press conference that addressed these issues. It is apparent from my reading of his statements and answers to questions that were posed to him that they understand our legitimate defense requirements as we understand their national security requirements. Each of us is committed to substantial reductions in our strategic nuclear forces. That effort is continuing and that dialogue and the strengthening of our relationship is also progressing, as I read the statements that have been made in the press.

Senator ALLARD. You and I both come to the same conclusion on that. They did not seem to have any kind of angry response as far as Russia was concerned.

Admiral ELLIS. That is correct, sir. I saw no indication of that in the press or elsewhere.

Senator ALLARD. Admiral, how will the changes in the NPR affect STRATCOM's role in planning and implementing military operations?

Admiral ELLIS. As we were discussing with the Chairman, as additional capabilities deliver and STRATCOM's inclusion of a broader range of capabilities and presenting strategic options for the Nation's leadership, our planning is going to have to become more robust and also more responsive to a growing range of contingencies, at both the strategic and potentially the regional level.

Senator ALLARD. Let me get a little more specific.

Admiral ELLIS. Yes, sir.

Senator ALLARD. Particularly as it would apply to rogue states, what would be our deterrent possibilities there? Do you think that there is something we can do to deter rogue states?

Admiral ELLIS. I think as we have discussed the drawdown in operationally deployed nuclear weapons in the wake of the NPR, it is clear that we have redefined or expanded the capabilities that have to be a part of deterrent concepts. The Nation has long had a policy related to those who might employ weapons of mass destruction against us, against our forces, or against our allies, in which, while we will not specify precisely what our response would be, it would be overwhelming and it would be devastating to those who might consider such an option. That deterrent statement posture still stands.

Senator ALLARD. Talk a little bit about your confidence in the stockpile remaining safe, viable, and effective in the short-term, mid-term, and the long-term.

Admiral ELLIS. Sir, as the old sage said, predictions are difficult, particularly when they concern the future. I think the important element about the science-based Stockpile Stewardship Program is that when it is fully in place it will give us the tools to more precisely assess and examine the aging stockpile as we move into the future years.

Obviously, the average age of the stockpile is approaching 20 years. There are elements to that that will logically be of concern to us, as there are with any aging system. So I believe that the Stockpile Stewardship Program will give us a better capability to identify problems. That is not the same as the ability to correct them or to guarantee, with certainty, that in the event of some unexpected wide-ranging and wholesale problem associated with the stockpile, that correction of such a deficiency might not ultimately call into question its reliability and then force us to address the issue of whether or not testing would be required.

But we are learning more about that stockpile every day. We are developing more and more tools, NNSA and the Department of Energy are, to more accurately assess and predict the effects of aging on that stockpile. So I have confidence in our ability to find the problems. But their correction and how large they are and what that does to our confidence in the systems is yet to be determined.

Senator ALLARD. Do not these considerations support the NPR recommendations that we sustain a substantial responsive force of

warheads, that we improve nuclear test readiness, and that we rebuild and sustain a capable nuclear weapons infrastructure?

Admiral ELLIS. I think, as you are well aware, sir, we have approached this in the United States' standpoint from exactly the posture that you describe. In other words, we have elected not to produce new designs or to produce new copies of old designs of nuclear weapons, and to rely on the weapons that are currently in existence to sustain us through the future years and requirements for this essential element of our deterrent posture.

All of the pieces that you describe are necessary elements to ensure that that capability is safe, secure, and credible for the future.

Senator ALLARD. My time has just expired. Thank you, Mr. Chairman.

Senator REED. Thank you, Senator Allard.

Senator Nelson of Nebraska.

Senator BEN NELSON. You may have been saved by the bell, Admiral.

Strategic Command relies heavily on the National Nuclear Security Administration's (NNSA) ability to ensure the safety and reliability of our Nation's stockpile. Since 1992 explosive tests have not been conducted. I understand you have indicated that you do not necessarily think that they are required, but instead a lengthy and tedious process of disassembly and inspection, to include the refurbishment, is under way.

Do you think that the development of this effort is effective at the present time? Can we develop improved surveillance, modeling, and simulation tools to show that earlier reliability assessments were optimistic? In other words, can we second-guess and improve our original predictions?

Admiral ELLIS. I think you are exactly right, Senator. The development of more sophisticated tools is going to give us the ability to more precisely monitor and assure ourselves exactly what the true status of the stockpile is, and that is the essential element in the science-based Stockpile Stewardship Program. That effort continues. There are very sophisticated modeling techniques under development. There are very complex and sophisticated tools that are being developed in the laboratories to give us a more complete understanding of the physics and the effect of age on these weapons.

All of that will give us more knowledge, more insight, more understanding, and then more confidence in what we know about the stockpile. So we will know more and not know less about this vital capability as we look to the future.

Senator BEN NELSON. Is the current funding adequate for us to be able to continue to improve the tools to go back and check the effectiveness of our predictions?

Admiral ELLIS. I certainly would not presume to speak for General Gordon, who heads NNSA, and say that his budget is entirely adequate. I suspect, like all folks, he has adjusted the pace of his programs as a reflection of the funding that is available. But in balance, clearly the additional focus and the additional resources that have flowed to the entire body of our strategic deterrent program, which includes the infrastructure, its upgrade and modernization, is a very positive step and will assist greatly in our pursuit of those objectives in the future.

Senator BEN NELSON. If we will reduce our warheads to a level of between 1,700 and 2,000 or in that range, is that possible within the time frame of 2012?

Admiral ELLIS. Yes, sir. The 1,700 to 2,200 number is achievable. All of those elements have to come together appropriately. As I say, the resources and attention that are being devoted to that give us some cause for optimism. The program is under way, and indeed the reductions and a number of the elements that are part of the NPR have already begun. So I think that is a very positive sign.

As with all programs that have a decade-long life or longer, the sustainment of that effort, the continued support, not just financial but also in terms of the intellectual capital, the people, the challenges we face in retaining and attracting new talent as the brain trusts in the laboratories approach retirement, those types of things have to be addressed as well as we look to the future.

Senator BEN NELSON. I appreciate it very much. Thank you.

Senator REED. Thank you very much.

Let me note that the vote has begun on campaign finance reform. I propose to recognize Senator Sessions for his questions and when he concludes at that point we would likely have additional questions which we would submit to you in writing and ask for your response.

Senator Sessions.

Senator SESSIONS. Thank you, Mr. Chairman. I am sorry I have not been able to be here as much as I would like.

Admiral Ellis, thank you for your leadership and work. I have great respect for you. I support the substantial reduction in our nuclear weaponry. We want to do that. But we do not have the capacity to build any new ones. We have completely eliminated our capacity to build new ones, have we not, Admiral Ellis?

Admiral ELLIS. That is correct, sir. We do not have the ability currently to build a complete nuclear weapon.

Senator SESSIONS. How many other countries in the world still have a capacity to build at this time, do you know?

Admiral ELLIS. I think all of those that are recognized as nuclear powers obviously have the ability to build them, because they have them currently. We elected to approach, as we were saying earlier, our sustainment of the stockpile in a different manner and that is to refurbish and sustain the older weapons rather than design and build new ones, which would require testing. This was a choice that the Nation made.

Senator SESSIONS. I believe that is a minimal step. If we are not going to have the capacity to build new ones, we ought to have a reserve capability. Else we freeze ourselves in a position where we cannot advance. It is critical that we not give our adversaries in the world a target of equality, a flat number that they know if they reach they would have equality with us.

Would you not agree that that is something we need to avoid?

Admiral ELLIS. Certainly, Senator, some element of our strategic deterrence contributes to all elements of our national strategy. It assures allies, it dissuades those who might choose to compete with us, it deters those who wish us ill, and those are significant elements of all our military forces, be they conventional or nuclear.

Certainly, the nuclear structure still plays a role in that deterrent policy.

Senator SESSIONS. I know we have to go. I would just note that to me we are the premier nuclear power, the premier military power in the world. We need to use that power responsibly, wisely, for the benefit of ourselves and the world. But it would be a colossal error if we were to create constraints on our military that encourages our adversaries to attempt to reach parity. That to me is more important or as important as anything else we discuss.

Thank you, sir.

Senator REED. Thank you, Senator Sessions.

Gentlemen, thank you for your outstanding testimony. I particularly want to thank Admiral Ellis because I know you had to adjust your schedule mightily to be here today. I appreciate it very much. We all do. We also appreciate the great leadership you are showing at Strategic Command. Keep up your good work.

We will keep the record open for 2 days and if there are additional questions we will present those questions to you in writing. Thank you very much. The hearing is adjourned.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JACK REED

ALTERNATIVES FOR SPACE PROGRAMS

1. Senator REED. Secretary Teets, according to current DOD regulations, all new major defense programs must conduct an Analysis of Alternatives (AOA), led by the Office of the Secretary of Defense (OSD) to determine whether there are more cost effective alternatives than the program being proposed. This helps fulfill the statutory requirement for the Joint Requirements Oversight Council (JROC) to perform an assessment of such alternatives. OSD has conducted AOA for all major Air Force space programs in the past. Do you plan to have OSD conduct AOAs for space programs in the future, and, if not, why not; how will the statutory requirements for JROC assessments of program alternatives be met?

Secretary TEETS. First, let me say that we will fully comply with all applicable statutes. Second, I anticipate that the JROC will continue to conduct assessments in fulfillment of its statutory responsibilities. With regard to AOAs, I expect the OSD staff will continue to be involved and participate in the conduct of AOAs; however, the effort will be led under my authority as the DOD space milestone decision authority and the leader of the Nation's national security space efforts.

DESCRIPTION OF "PATHFINDER" PROCESS

2. Senator REED. Secretary Teets, in your testimony you described a "pathfinder" acquisition process for GPS–III that is underway. This pathfinder process is intended to allow "full involvement by OSD and the other Services," and "fit DOD statutory requirements." Could you please provide details as to how this pathfinder process works, and how it has been received, for example, what sort of meetings have you held with OSD personnel, at what management level, and has the response from OSD participants been positive?

Secretary TEETS. The GPS–III program was identified as the "pathfinder" for the streamlined DOD space acquisition process by Mr. Aldridge. Our goal is to reduce the workload and shorten the decision time for key acquisition milestones while still ensuring appropriate insight and oversight. A key aspect of the streamlined process is the use of a single, focused, Independent Program Assessment (IPA) Team in place of multiple Integrated Product Teams (IPTs), thereby allowing stakeholder participation and insight while decreasing the amount of time involved by reducing the number of IPTs and the hierarchical coordination approach. I would be happy to provide additional details in a briefing at your convenience.

Since being confirmed as the Under Secretary of the Air Force, I have had the privilege to talk with Mr. Aldridge, who is fully supportive of the space commission implementation, on several occasions concerning our efforts to streamline the DOD space acquisition process. Members of my staff have also met with OSD staff to pro-

vide information on how the streamlined process would work for GPS–III and/or other DOD space-related programs and encourage their participation throughout. In addition, members of the OSD and Joint Staffs have participated as part of the GPS–III IPA Team. Reaction to the idea of a streamlined approach to acquisition oversight for DOD space systems has been mixed. I believe we are in the initial stages of making change happen. As we work to define and refine the new process, we will involve the appropriate parties to ensure that their views are heard.

3. Senator REED. Secretary Teets, what is the forum for OSD participants to ask and receive answers to programmatic questions, what new GPS programmatic issues have been raised as a result of the new process, and how are they being resolved?

Secretary TEETS. There are four forms in which OSD participants can ask and receive answers to programmatic questions. The first is the normal day-to-day conduct of business. Members of my staff are available to answer OSD questions regarding any DOD space program and the OSD staff has access to the same data from the Program Executive Office (PEO) that my staff uses. The second forum is part of the normal budget cycle activity whereby the Department makes its funding decisions in preparation for the eventual submission of the President's budget. Third, when a program is under review in preparation for a milestone decision or key decision point, an IPA Team will be formed to review that program. Members of OSD will participate as part of that IPA Team so their issues can be brought forward and properly addressed as part of the program review. Lastly, the meeting where a DOD space program milestone decision is made will be known as a Defense Space Acquisition Board (DSAB). I will invite the appropriate OSD principals to attend the DSABs so that I can gain the benefit of their counsel prior to making milestone decisions for the DOD space Major Defense Acquisition Programs.

In answer to the second part of your question about "new GPS programmatic issues raised as a result of the new process," we have not yet completed the GPS–III pathfinder activities, so I am not aware of any new GPS programmatic issues at this time. I do expect to conduct a DSAB for GPS–III in the late summer, early fall timeframe and will be in a better position to answer your question at that time.

RAPID OSD REVIEWS

4. Senator REED. Secretary Teets, you noted in your testimony that a major goal for you is reducing the decision cycle time for space programs, noting that the Defense Acquisition Board (DAB) process, with its associated IPT meetings, takes "months not weeks," and that you are aiming for a much shorter process. It is my understanding, however, that the reason the IPT process takes as long as it does is because the program and the OSD oversight organizations are working to resolve issues, some of which require additional analysis and time to reach a mutually acceptable outcome. Furthermore, I understand it is highly unusual for a program to actually be delayed during this period, because the contractors continue to work as the government deliberates. Can you please identify which space programs have experienced delays in actual contractor progress as a result of the current DAB/IPT process, how long those delays were, and could you also please explain how, under an expedited decision process, there will be enough time to perform requisite analyses to resolve issues in a mutually acceptable way?

Secretary TEETS. While there are always issues that need to be resolved on any major acquisition program, successful resolution of these issues is not necessarily directly related to a lengthy review, coordination, and consensus process. The NRO has had success utilizing a focused program review process for complex space programs that appears to be more timely than the current DOD IPT process. Since the NRO is able to make decisions of the same quality as the DOD on complex space systems, but can do it in 8–12 weeks instead of 8–12 months, I'm very interested in using that decision process. It is difficult to explicitly name for you the programs that have experienced delayed progress as a result of the DAB/IPT process—mainly due to the fact that the blame for programmatic delay can be accurately shared amongst many parties. However, we can definitely begin to address reducing the imposed instability caused by our current lengthy decision process by changing the process itself and reducing its timeline. I believe this is important because the crafting of a realistic program schedule is the first step for cost control. Decision delays cause program schedules to be lengthened for reasons beyond the program's control. The end result of a lengthy decision making process and the resulting stretch of a program's schedule can be to cause the total cost of a program to increase. My goal is to reduce, if not eliminate, this self-imposed instability factor.

PLANNED WAIVERS

5. Senator REED. Secretary Teets, do you currently anticipate waiving, or recommending waiving, any DOD regulations for space programs, and if so, which regulations and why would you want to waive them?

Secretary TEETS. The Under Secretary of Defense for Acquisition, Technology and Logistics (USD(AT&L)) has given me the authority to waive and/or grant exemptions to DOD instructions and publications, for DOD space-related programs, that are under the authority of his office. I am to inform him of the waivers and exemptions I have granted.

I anticipate granting the appropriate waivers and exemptions to DOD Instruction 5000.2 and DOD Regulation 5000.2–R. These DOD documents describe an acquisition oversight process meant to cover a wide variety of items (e.g., helmets to F–22s) and are focused on making the most cost-effective production decision. While this process may fit a good number of DOD system types, the acquisition of space programs—especially satellite systems—is different. The focus of the current DOD 5000 process is not the most appropriate construct for acquiring space-related systems.

My staff is in the process of developing a document to be used in place of the DODI 5000.2 and DOD 5000.2–R that will be written to address the nuances of acquiring DOD space systems. The new document will comply with existing acquisition related statutes just as the DOD 5000 series does today. The difference is that the process described in the new document will be focused on how best to acquire space-related systems.

HOW TO PREVENT ANOTHER SBIRS-HIGH

6. Senator REED. Secretary Teets, in the 1990s, the SBIRS-High satellite program was touted as a "lead program for acquisition reform." "Acquisition reform," as applied to the SBIRS-High program, involved a conscious decision to minimize the amount of government oversight. It was recently revealed that the SBIRS-High program has experienced billions of dollars of cost growth, and the program is 4 to 5 years behind its original schedule. As a result, the Air Force set up an independent review team to assess the corrective actions required to get the program back on track. Many of these corrective actions involve restoring appropriate government oversight to the program. You stated in your testimony that you were going to review other current space programs to ensure they have an appropriately robust level of government oversight. Could you please describe this review process, what the results are to date, and how you intend to assure robust Air Force and OSD oversight will occur for space programs; and could you also indicate what input and comments OSD oversight organizations have provided on this issue?

Secretary TEETS. The "corrective actions" of "restoring appropriate government oversight" to the SBIRS-High program have been taken at all levels of government and contractor management. Due to the Total System Performance Responsibility (TSPR) clauses that were part of the SBIRS-High contract, the System Program Office (SPO) did not have the ability to appropriately monitor and control contract work. The removal of those TSPR clauses on the SBIRS-High effort will enable the SPO to establish the necessary access, insight, and control required to appropriately manage the SBIRS-High program. The Air Force senior leadership is directly involved with the ongoing corrective actions and assessment of alternatives.

I have already begun the effort to reestablish program stability and management discipline within Air Force space programs. In the past, increased management discipline was accomplished through the addition of oversight layers within the Air Force and OSD. However, instead of adding additional oversight layers, I am personally focusing on the major space programs and working closely with the Program Executive Officer for Space, Lt. Gen. Brian Arnold, to ensure senior management, outside program offices, is actively engaged on all our space acquisition efforts. I believe the resulting streamlined process will facilitate timely senior-level decisions and provide space-oriented expertise and direction when needed.

SPACE CAREER AND CADRE DEVELOPMENT

7. Senator REED. Secretary Teets, could you please outline the plan you have for developing the "cadre of Air Force space professionals" that you describe in your testimony?

Secretary TEETS. In response to the Space Commission Report and a memo from the Secretary of Defense, dated October 18, 2001, Air Force Space Command is de-

veloping a Space Career Management Plan. This plan establishes a deliberate and repeatable process, driven by requirements and based upon competencies, to ensure we can place the right people, with the right skills in the right positions to achieve national security space objectives. The development process spelled out in the career management plan is built upon three major pillars: education, training, and experience. These pillars are provided as methodology to attain leadership skills and levels of certification that will ensure we properly develop our space professionals through increasingly advanced education, training, and experience.

8. Senator REED. Secretary Teets, how much funding is being allocated to new effort, what types of training do you plan to provide, and who will be trained?

Secretary TEETS. Air Force Space Command is requesting funding for the career management plan in the fiscal year 2004 Program Objective Memorandum (POM) process. Their POM submission will identify funds necessary to fully develop and implement the new education and training requirements outlined in the career management plan. These requirements include common initial education and training for all space professionals entering the career field. This common initial training will provide space professionals with a single foundation of knowledge spanning all aspects of military space—from concept through acquisition, to operations and eventual disposal of space systems. The plan also identifies a continuum of follow-on education and training requirements to increase technical depth and breadth for all space professionals throughout one's career.

9. Senator REED. Secretary Teets, will this effort focus on military officers, civilians, or both, and will there be incentives for people with solid technical backgrounds to join the space acquisition community to help oversee the programs and prevent future problems?

Secretary TEETS. The Space Career Management Plan identifies all personnel considered to be space professionals—officers, enlisted, and civilians. As previously mentioned, the plan ensures a blend of expertise within the space professional career field to support a "cradle to grave" organizational philosophy while, at the same time, providing solid military space capabilities. Not only will this plan permit those with solid technical backgrounds to flourish, it encourages them by providing leadership opportunities at various levels and providing many opportunities to apply their technical expertise throughout their space professional careers.

ADVANCED WIDEBAND SYSTEM CONCEPT AND FUNDING

10. Senator REED. Secretary Teets, the Air Force has proposed almost $200 million of basic technology funding to begin development of something called the "Advanced Wideband System" of communication satellites. This system is supposed to be launched in 2009, but as of now I understand there is no description of exactly what the system is. Furthermore, I understand the first study to begin to define what it is, is not due until June 2002. Just what is the Advanced Wideband System, and why do you think you need a full $200 million next year for it, and particularly when the system has yet to complete its first concept study?

Secretary TEETS. Early transformational success depends on the convergence of several technological and engineering challenges. The $200 million in technology funding will be used to provide the technology pipeline for the Transformational Communications Enterprise (TCE). Additionally, it will fund both the concept definition phase of a network centric architecture of SATCOM systems and later in the fiscal year, the beginning of pre-acquisition studies at a detailed engineering level. It is anticipated that the concept definition phase will produce several pre-acquisition programs with multiple contractors engaged in concept exploration in fiscal year 2003 to cover strategic and tactical user needs, backbone and relay functions, and associated terminals. We will also be funding multiple technology developments to mature useful technologies for the TCE. The study currently underway, and planned for a July 2002 final out-brief, analyzes several alternative architecture approaches with the goal of removing communications as a constraint to the warfighter. Some of the problems that we are working to resolve are more timely support for airborne ISR, greater connectivity between joint warfighters, and more simple, standardized terminals. The vision for the effort is an enduring enterprise that will provide secure, internet-like communications services.

SPACE-BASED RADAR

11. Senator REED. Secretary Teets, the Space-Based Radar roadmap study, submitted to Congress in February, states that DOD has established a goal to deploy a Block I Space-Based Radar system by fiscal year 2008 or fiscal year 2010. The study also states that fiscal year 2002 and fiscal year 2003 will be "dedicated to crafting [Space-Based Radar] requirements, assessing architectures, accomplishing [Analyses of Alternatives], and defining the concept of operations." The proposed fiscal year 2003 budget for the Space-Based Radar is about $100 million, four times the fiscal year 2002 level. Why was 2008 picked as the goal for a Block I Space-Based Radar and what are the key requirements a Block I system must fulfill; and why do you need $100 million, quite a substantial sum, just to complete studies and analyses on the proposed system?

Secretary TEETS. The current SBR funding profile in the fiscal year 2003 President's budget request represents a focused risk-reduction approach to fielding an operational SBR as recommended in the SBR report to Congress (signed by Deputy Secretary of Defense on 22 February 2002). The program emphasizes risk reduction and initiates the Concept Definition phase. The efforts entail manufacturing non-flight prototype hardware and software by contractors skilled in space system integration to confirm system performance. This moves beyond studies and analyses of the proposed system. The earliest opportunity for Initial Launch Capability (ILC) provides a SBR program focused on a Ground Moving Target Indication (GMTI) capability with inherent Synthetic Aperture Radar (SAR) and Digital Terrain Elevation Data (DTED) functionality. The key requirements a "Block I" system must fulfill are being defined under the current requirements effort. We will use the Operational System Acquisition approach to implement spiral development. The capability to be launched at ILC will provide some operational utility, but exactly what will be provided against which requirements is still in work. Since the warfighter needs these capabilities as soon as they can be made available, launch dates will be determined by technology maturity, technical risk, and available funding. We will shape the requirements and initial operational capability so the warfighter has some useful operational capability. This block will reflect the results and insights gained from the requirements, architecture, and AOAs work and initial technology investments. We anticipate an ongoing system requirements process that will further refine SBR requirements as well as flow-down system-of-systems requirements. These requirements will be evaluated and considered for inclusion in the first block SBR or deferred to a second block SBR system.

NPOESS AWARD FEE OF 20 PERCENT

12. Senator REED. Secretary Teets, I understand that the National Polar-orbiting Operational Environmental Satellite System (NPOESS) weather satellite program office plans on providing an award fee of up to 20 percent to the program's contractor. I further understand that this award fee is significantly higher than the minimum award fees typically given to defense space programs, which range up to 15 percent at the highest. The total program is over $6 billion. If a 20 percent award fee were applied to the whole program, it would cost taxpayers over $1 billion. Is the NPOESS maximum award fee to be 20 percent, and if so, why is it so much higher than that of other major defense space contracts?

Secretary TEETS. The acquisition strategy includes a maximum fee of 20 percent. However, the 20 percent fee does not apply to the whole $6 billion program, but only to portions of the System Development and Demonstration (SDD) and production phases. It does not apply to Operations and Maintenance (O&M) after Initial Operational Capability (IOC), to the launch services, to the government program office costs, or to any of the nearly $1 billion of development in the Program Definition Risk Reduction (PDRR) phase. In addition, not all the fee is an "award fee." The fee structure is intended to incentivize critical elements of the program to assure success. Significant portions of the fee are specifically tied to key events that demonstrate the system's performance.

Fee breakdown:

- Development (Cost Plus Award Fee): 2 percent base fee, 13 percent award fee, and 5 percent mission success fee
- Production (Fixed Price Incentive Fee/Award Fee): 10 percent target profit, 5 percent award fee, and 5 percent mission success fee

Furthermore, all of the fee is held at risk until the satisfactory performance of the system over a specified number of years. Therefore, in the event the system does

not meet all the requirements (including satellite on-orbit longevity), the government will receive some or all of the fee back from the contractor.

The 20 percent level was judged appropriate for the level of risk the contractor is going to undertake. The November 2000 Defense Science Board (DSB) study found that historic fees are insufficient to make defense work profitable and are contributing directly to the decline of the high technology industrial base. The 20 percent maximum fee provides a commercially competitive rate of return for the system contractor who will deliver the complete NPOESS. The complete system includes the ground data processing system; all the software; the complete command, control, and data relay system; satellite coverage in three orbits; the satellites; all the sensors; and operation of the satellites (including the NPOESS Preparatory Project) through IOC.

The maximum 20 percent fee is one of the innovative tools the NPOESS program is using to ensure the developed system is capable and reliable. The benefit of more reliable and longer-lasting satellites is considerably more than the marginal cost of the higher fee.

13. Senator REED. Secretary Teets, who made the NPOESS award fee decision?

Secretary TEETS. The level of fee is part of the NPOESS Acquisition Strategy, which has been fully coordinated through the Air Force Headquarters Staff, OSD, and National Oceanic and Atmospheric Administration (NOAA) and approved by me.

ADVANCED EHF PROGRAM STATUS

14. Senator REED. Secretary Teets, late last year press reports indicated that the Advanced EHF satellite program, which is the follow-on to the MILSTAR system, was running as much as $1 billion over budget, partly because of increased performance demands being made by the Pentagon. You are asking for almost $1 billion for this program in fiscal year 2003. What is the current status of this program, what program activities are you planning to fund in fiscal year 2003, and are the requirements for the program now stable or are they still being debated?

Secretary TEETS. The AEHF program awarded the System Development and Demonstration (SD&D) letter contract in November 2001 and is currently in negotiations for contract definitization which should be completed by July 2002. The issues involving increased performance demands against an acceptable funding level have been resolved. The program is currently in the midst of preliminary design reviews. Of the $825.8 million requested in fiscal year 2003 for AEHF, $777.4 million is planned for the SD&D effort with the primary contractor, $19.4 million for cryptographic development, $25.5 million for technical and program office support, and $3.5 million for the Joint Terminal Engineering Office efforts. Over half of the $777.4 million SD&D effort is planned for work associated with the EHF payload (e.g., antenna subsystem, RF subsystem, and crosslink subsystem design) with remaining funds identified for efforts involving the mission control system, spacecraft bus, and overall systems engineering.

SBIRS-HIGH

15. Senator REED. Secretary Teets, the High Component of the Space-based Infrared System, or SBIRS-High program, is being designed as a more-capable replacement for our current system of early-warning satellites, to provide notice of a missile launch against us. It was recently revealed that the program is over cost by more than $2 billion, and will incur a schedule slip of 18 to 24 months. Equally disturbing is the fact that, as I understand it, this large cost and schedule growth was not anticipated by the Air Force—it came as a very unwelcome surprise. I also understand that because of these problems, the Department may decide to terminate it, after spending well over $1 billion on it. What were the technical reasons that caused the problem and were there underlying management failures which contributed to the problem?

Secretary TEETS. A 2-year delay in development and fielding of the Increment 1 ground system impacted the System Program Office's (SPO's) ability to focus on later phases of development. Recovery from the initial failure and achieving Increment 1 Initial Operational Capability (IOC) became an imperative for SPO and Lockheed Martin management focus.

Likewise, the need to redesign the Geosynchronous Earth Orbit (GEO) spacecraft to maintain Operational Requirements Document (ORD) key performance parameters also had a significant impact on cost control. This solar-flyer redesign activity

resulted in a 6-month slip to the spacecraft and payload critical design reviews last year and drove additional ground processing functionality to a much greater extent than originally anticipated.

At Secretary of the Air Force direction, and in concert with Lockheed Martin, an IRT was formed in November 2001 to review the program and diagnose the root causes and contributing factors of the significant cost growth. Three root causes were identified, as follows:

- The program was too immature to enter the detailed System Design and Development phase. In general, faulty and overly optimistic assumptions laid the groundwork for SBIRS-High program activation in 1996. These included: extensive software reuse; high software productivity levels; commercial practice benefits; economic order efficiencies with satellite lot buys; availability of technical models; mature understanding of requirements, Concept of Operations (CONOPS), and interface specifications; and management stability.
- The system requirements and their flow-down into engineering solutions were not well understood. The systems integration effort on the SBIRS-High program was significantly underscoped, both in terms of complexity and the associated impacts. In effect, the requirement refinement process was "ad hoc," created uncertainty on the status of program priorities, and impacted cost and schedule.
- A significant breakdown in execution management occurred, within both the government and the contractor teams. The optimistic assumptions that were not borne out, and the flux in the program requirements, as well as the 2-year delay to the program in fiscal year 1999 due to other higher budget priorities, eventually overwhelmed the management of the program. Under pressure, the process discipline failed and the processes in place failed.

16. Senator REED. General Eberhart, how important is the SBIRS-High program, and what requirements will it fulfill?

General EBERHART. SBIRS-High is critical to our Nation's ability to detect emerging strategic and theater ballistic missile threats. It will replace the 30-year-old Defense Support Program and will support warfighters' requirements of missile warning, missile defense, technical intelligence, and battlespace characterization.

17. Senator REED. General Eberhart, would a evolutionary approach to meeting the requirements be acceptable, and if so, should the current Operational Requirements Document for the system be revisited?

General EBERHART. We believe an evolutionary acquisition approach for SBIRS is acceptable. The Operational Requirements Document was revalidated in January 2002 and accurately reflects the requirements for SBIRS-High.

SBIRS-HIGH FUNDING

18. Senator REED. Secretary Teets, the SBIRS-High satellite program has recently experienced significant cost growth, schedule slippage, and concerns over program management. I understand the Department is still considering whether or not to proceed with this program at all, or to cancel it and begin a replacement program. Why then does the proposed budget include over $800 million for this program, almost double last year's funding level, and how can you be sure such a troubled program will effectively execute such a large increase in funding?

Secretary TEETS. The SBIRS-High program was certified by the Under Secretary of Defense (Acquisition, Technology, & Logistics) on 2 May 2002, as required by the Nunn-McCurdy Act to continue the program. The certification affirms that the program is essential to national security, that there are no alternatives to the program that provide equal or greater military capability at less cost, that the cost estimates are reasonable, and that the management structures are in place to manage the program and control costs. There is particularly strong consensus among our most senior military leaders that the SBIRS-High program is essential to national security based on the advanced capabilities it provides for Missile Warning, Missile Defense, Technical Intelligence, and Battlespace Characterization.

The fiscal year 2002 approved program will be increased to $526.9 million upon congressional approval of the $88.3 million above threshold reprogramming (ATR) request has been delivered to Congress. The fiscal year 2003 increase will then be $288 million over adjusted fiscal year 2002 program funding. The basis for the funding requested in fiscal year 2003 is as follows:

$814.9 million—Total fiscal year 2003 RDT&E budget request, broken out as follows:

$749.2 million—Continue Engineering and Manufacturing Development (EMD) contract for Space and Ground segment development (includes Government Furnished Equipment; Geosynchronous Earth Orbit (GEO) development; GEO 1&2 integration, assembly and test; Highly Elliptical Orbit (HEO) 1 development/delivery; HEO 2 integration, assembly, and test; Ground System development; System Engineering and Program Management, Increment 1 Pre-operations support)

$39.9 million—Host program office support (includes payload to spacecraft integration, common satellite bus services, communication links)

$6.2 million—Continue Air Force System Program Office support

$19.6 million—Continue technical analysis and independent verification and validation of contractor by federally Funded Research and Development Contractor (FFRDC)

The fiscal year 2003 budget request supports delivery of the following SBIRS capabilities:

Interim Mission Control Station Backup (IMCSB) Certification	Oct. 2002
HEO 1 Payload Delivery	Jan. 2003
HEO Launch & Early on Orbit Test Capable	Sept. 2003
Integrated Training Suite Initial Operational Capability	Oct. 2003

In addition to specific deliveries, development work on the GEO payload, spacecraft and ground software, HEO payload integration and system compatibility tests, payload factory support capabilities, and software sustainment activities will continue in fiscal year 2003 to support subsequent years critical program milestones.

The Air Force has restructured SBIRS-High to make it executable. We have established a realistic baseline; to ensure we effectively execute that baseline, we have implemented management changes based on senior Air Force, DOD, and Independent Review Team findings. Key changes are outlined below:

A tiered management oversight structure has been established to focus senior Air Force and corporate leadership review on program progress and resolution of critical program issues. The objectives of these reviews are to assure management effectiveness; cost, schedule, and technical performance; and rapid program decision-making. The reviews include quarterly Chief Executive Officers (CEO) meetings, bimonthly President's meetings, and monthly Executive Committee meetings. Specific membership on the boards varies, but always includes senior leadership from the acquisition and operational communities, as well as industry.

The Program Executive Officer for Space and I review aspects of the program even more frequently. Significant changes in program management philosophy and structure have been implemented to improve program performance. The Engineering and Manufacturing Development (EMD) contract was awarded in 1996 with a total system performance responsibility (TSPR) clause. However, the TSPR concept has not achieved the desired result. Consequently, the clause has been removed from the contract. The program office will play a proactive role in the day-to-day management of program activities and acknowledges responsibility for system performance, cost, and schedule management. The program office will resume leadership of functions that had been relinquished to the contractor under TSPR. The SBIRS management philosophy is predicated on integrated government/contractor teams functioning under a unified systems engineering approach. The integrated master plan (IMP) has been restructured to provide cross-IPT emphasis. Contract management oversight and contractor incentives will be tied to major milestone accomplishments through the Award Fee Plan. Greatly increased government oversight and involvement should preclude further precipitous cost increases.

The System Program Office (SPO) established a Program Management Board to control content changes and disposition any future cost variances. Should issues arise, alternatives will be fully assessed to address cost offsets with joint contractor, user, and SPO participation. Additionally, new requirements will be controlled to avoid cost growth without associated budget. The contractor has also established a weekly Systems Engineering Review Board that addresses program issues and coordinates interfaces and interdependencies across IPTs to reduce potential surprises or minimize their impact.

QUESTIONS SUBMITTED BY SENATOR WAYNE ALLARD

DETERRING ROGUE STATES

19. Senator ALLARD. Admiral Ellis, is STRATCOM confident that it understands how to deter rogue states? What steps are being taken to better understand how rogue states are deterred?

Admiral ELLIS. U.S. Strategic Command recognizes deterring rogue states is clearly different than deterring the Soviet Union during the Cold War. As articulated in the NPR Report to Congress, terrorists and rogue states armed with weapons of mass destruction are likely to test America's security commitments to its allies and friends, and a broader array of capabilities will be needed to deter these actors from undertaking the political, military, or technical actions that would threaten U.S. and allied interests. Currently, we are examining the policies and capabilities required to deter rogue states. Specifically, my Strategic Advisory Group is studying the policy and intelligence perspectives of rogue state deterrence, and will report back to me over the next 6 months. Also, we are working closely with the national intelligence community to best posture and plan for the expanding deterrence mission.

MISSILE DEFENSE

20. Senator ALLARD. Admiral Ellis, how will STRATCOM integrate missile defense into its planning processes?

Admiral ELLIS. Many variables associated with missile defense remain undefined at this early stage, and it is difficult to foresee with any degree of certainty the final impact missile defenses will have on offensive planning. However, one aspect is absolutely clear; offensive and defensive operations must be fully integrated to support timely and effective national-level decision making. In addition, the U.S. will conduct continuous assessments of its new strategic capabilities, to include the fielding of missile defense systems, as it sizes its offensive strategic forces.

NUCLEAR POSTURE REVIEW

21. Senator ALLARD. Admiral Ellis, there has been substantial press coverage in recent days of the NPR that has suggested that the U.S. now targets a number of nations with its nuclear weapons, that U.S. nuclear weapons use is somehow more likely because they will now be used to deter the use of chemical and biological weapons, and that the NPR calls for the development of a new generation of U.S. nuclear weapons. Has STRATCOM engaged in contingency planning against a range of targets in the past, and was it the policy of the Clinton administration to deter rogue states from using chemical and biological weapons with the threat of nuclear retaliation?

Admiral ELLIS. There is no change in the U.S. deterrent strategy with respect to rogue states and their weapons of mass destruction. As was the case in the previous administration, the President retains all appropriate options to protect the American people and our friends and allies. For example, in his final report to Congress in January 2000, then-Secretary of Defense Cohen declared we must "maintain nuclear forces sufficient to deter any potential adversary from using or threatening to use nuclear, chemical, or biological weapons against the United States or its allies." Also, in 1996 then-Secretary of Defense Perry stated, ". . . we continue to maintain a nuclear deterrent . . . absolutely devastating in its destructive power. Anyone who considered using a weapon of mass destruction against the United States or its allies must first consider the consequences."

22. Senator ALLARD. Admiral Ellis, the NPR recommends that the offensive leg of the new triad include both nuclear forces and advanced conventional munitions to provide options over a broader range of contingencies. To what extent will STRATCOM be engaged in planning and executing conventional force options and is STRATCOM interested in the development of advanced conventional weapons and delivery systems, potentially including conventional payloads for missiles?

Admiral ELLIS. U.S. Strategic Command currently has a small, but growing role in supporting regional combatant commanders with conventional weapons planning. We expect this role to expand substantially in the future, and will pursue those capabilities, to include advanced conventional forces, which provide global reach, rapid response, and strategic effects.

23. Senator ALLARD. Admiral Ellis, the NPR seeks to provide improved flexibility and a broader range of options to deal with unexpected contingencies. This in turn will require better intelligence, planning capabilities, and command and control. How long is STRATCOM's current planning cycle, what is STRATCOM's goal, and what are the key programmatic elements of an improved planning capability and are they fully funded in the fiscal year 2003 budget and throughout the Future Years Defense Program (FYDP)?

Admiral ELLIS. U.S. Strategic Command's current adaptive planning cycle timelines are dependent on the size and scope of the task. The shortest reaction time is possible when an existing option can be modified to strike targets already in the command's target data base. This process would be measured in hours for one ICBM/SLBM, or one bomber delivered weapon. If a new option is required and the targets are not in the intelligence community's worldwide data base, the development time is increased substantially. U.S. Strategic Command's goal is to provide effective adaptive nuclear planning and surety in the minimum possible time. Modeling and simulation indicate the command's future planning timelines can be reduced up to 75 percent with enhanced system integration, optimization, and process reengineering. Although these initiatives are not funded in fiscal year 2003, the fiscal year 2004–2009 POM initiative submitted to the Air Force will incrementally deliver improved capabilities. If fully funded, an improved planning process integrating military capabilities across the entire conflict spectrum is forecast to achieve Full Operational Capability (FOC) in fiscal year 2010.

24. Senator ALLARD. Admiral Ellis, what are the key programmatic elements of an improved command and control system and are they fully funded in the fiscal year 2003 budget and throughout the FYDP?

Admiral ELLIS. World-wide survivable communication capability for strategic forces and nuclear command and control system (NCCS) elements is dependent on a seamless transition from the current MILSTAR satellite communications constellation to the follow-on Advanced Extremely High Frequency (AEHF) constellation. The fiscal year 2003 budget supports this transition and funds a transformation communications study to examine alternative architectures that meet strategic and tactical needs. A critical component of this architecture is the development and fielding of AEHF terminals on all NCCS elements before the existing MILSTAR constellation degrades. In addition, the recent, significant funding improvements in E–4B National Airborne Operations Center (NAOC) and E–6B Airborne Command Post long-term modernization and sustainment programs will ensure these vital airborne command and control platforms can support national-level decision making and force direction in future crises. U.S. Strategic Command's Mobile Consolidated Command Center (MCCC) is funded in the fiscal year 2003 budget but has significant shortfalls across the FYDP. The Department is conducting a review of the overall MCCC program. Additionally, I am working with the Services on modernization of the equipment used for secure encrypted communications with not only our strategic forces but also the entire military. This equipment will require replacement beginning in fiscal year 2005, but remains unfunded in the FYDP.

25. Senator ALLARD. Admiral Ellis, the NPR indicates that DOD will conduct regular reviews of the adequacy of U.S. nuclear forces and assessments of the viability of the NPR-recommended nuclear force reductions. Will the criteria STRATCOM uses to reassess the sufficiency of nuclear force levels recommended by the NPR include the health and capabilities of the other legs of the new triad?

Admiral ELLIS. Future assessments of the adequacy of U.S. nuclear forces will be conducted using several complementary criteria. Among them will be the global security environment, the emerging capabilities of nuclear and non-nuclear strike forces, our progress in developing active and passive defenses, and the health of our research and development efforts and industrial infrastructure.

26. Senator ALLARD. Admiral Ellis and General Blaisdell, the Minuteman III will be modernized in a number of efforts that are currently planned to proceed more or less in unison to maximize efficiency, minimize cost, maximize security, and minimize disruption to forces in the field. Delays or complications in any of these programs could impact cost and schedule for the other efforts. Are STRATCOM and the Air Force confident that multiple, simultaneous upgrades to the Minuteman is a prudent, low risk approach to preserving ICBM capability?

Admiral ELLIS. Minuteman III modernization programs are synchronized to field upgrades in a series of just-in-time deployments. A prime example is the synchronization of the guidance replacement program (GRP) and the propulsion replacement

program (PRP). The PRP booster requires a GRP guidance set, and as a result, the stability of GRP is key to maintaining on-time deployments of PRP boosters. As you stated, the primary risk to the overall Minuteman III program is a change to one of the interlocked, supporting programs. The Air Force aggressively worked the technical issues that have occurred during design, test, and deployment, and I am confident, if individual program stability and funding levels are maintained, the approach to Minuteman III modernization is appropriate.

General BLAISDELL. The Air Force regards the Minuteman III modernization approach as overall low risk. The primary risk associated with our interdependent system upgrades is largely based on maintaining required funding to support projected delivery schedules to the field. This risk has been successfully mitigated through consistent support by U.S. Strategic Command, OSD, Congress, and the Air Force. In addition, any potential risk that may arise due to the interdependence of programs (for example, the propulsion replacement and guidance replacement programs) is mitigated by careful synchronization and planning by our logistics, maintenance, and security force professionals. The plan minimizes maintenance and security forces deployments by maximizing delivery and install trips to the field.

27. Senator ALLARD. Admiral Ellis and General Blaisdell, are STRATCOM and the Air Force confident that the operational availability of the Minuteman force throughout this process can be sustained at acceptable levels and will these levels vary significantly from the availability levels achieved historically?

Admiral ELLIS. U.S. Strategic Command actively monitors and coordinates with the Services on force modernization, and we are confident Minuteman III operational availability will be sustained at acceptable levels, similar to those sustained historically. Air Force Space Command is committed to providing the required number of strategic alert ICBMs, and the ongoing modernization processes will be accomplished within those current and future ICBM alert commitments. Historically, modernization processes have not significantly interfered with Minuteman alert rates.

General BLAISDELL. The Air Force coordinates very closely with U.S. Strategic Command to ensure the historically high ICBM alert rate of approximately 99.6 percent continues to provide the warfighter with the most effective and reliable weapon system in our nuclear inventory. Due to the carefully planned integration and synchronization of the Minuteman III modernization programs, the Air Force is committed to ensuring operational availability will remain at consistently high levels throughout force modernization.

BOMBER ROADMAP

28. Senator ALLARD. Admiral Ellis, the Air Force bomber roadmap indicates that the current nuclear capable bomber force will remain in place, with no additional procurement, through about 2040. At that time, the average age of the B–52 fleet would be about nearly 80 years and the B–2 fleet would be about 45 years. Are you satisfied with this roadmap?

Admiral ELLIS. I fully support the Air Forces' bomber roadmap, to include full funding and timely fielding of various B–2 and B–52 modernization and sustainment programs and the goal of starting a new bomber acquisition program not later than the 2012–2015 timeframe. However, we will need to monitor the impacts of unforeseen aging problems with the airframes themselves as we continue to use these venerable aircraft in the war on terrorism. I support the Air Force's ongoing comprehensive review of the bomber roadmap and look forward to reviewing the results.

29. Senator ALLARD. Admiral Ellis, do you believe that the modernization plans for the bomber force are adequate, given STRATCOM's requirements?

Admiral ELLIS. I fully support current Air Force bomber modernization plans and believe the program is structured to meet current and future U.S. Strategic Command requirements. Of particular interest is full funding and timely fielding of survivable communications upgrades in the B–2 and B–52. In addition, ongoing and planned avionics upgrades and situational awareness and electronic countermeasures improvement programs are essential to ensure the effectiveness of the bomber force for the next four decades.

ADVANCED EXTREMELY HIGH FREQUENCY

30. Senator ALLARD. Secretary Teets, the committee has been informed that U.S. allies who were contributing to the Advanced Extremely High Frequency (AEHF) program have not provided expected fiscal year 2002 funds because of their concerns that the new transformational communications satellite strategy may result in a smaller AEHF constellation that will not meet their needs. Will you be taking steps to assure our allies involved in this program that the AEHF program will remain responsive to their needs?

Secretary TEETS. The AEHF International Partners (IPs) did voice concerns over resource assurance. To alleviate this concern, ASD/C^3I has prepared a letter to assure the IP's access to all space segment resources. The letters to Canada and the United Kingdom have been sent, and the letter to the Netherlands is in final DOD coordination.

31. Senator ALLARD. Secretary Teets, is the AEHF program technically sound and are you satisfied with the industry management structure?

Secretary TEETS. The AEHF program is quite challenging but appears technically sound. I am satisfied with the industry management structure.

EVOLVED EXPENDABLE LAUNCH VEHICLE

32. Senator ALLARD. Secretary Teets and General Eberhart, the Air Force decision to support two competitive EELV launch vendors was based in part on projections of a robust commercial launch market. These projections have been overly optimistic as a result of the failure of a number of commercial low earth orbit communications satellite programs. Are you concerned that the decline in the commercial launch market will undermine the viability of the two EELV launch vendors?

Secretary TEETS. Yes. However, maintaining two viable launch service providers is essential if we are to have assured access to space for our critical national security space sensors. Competition produces savings and flexibility in addition to more reliable access to space for our nationally critical payloads. The EELV program is a partnership with industry in which the Government shares in both the significant savings and the potential risks. Due to the downturn in the commercial market, it is reasonable to expect the overall cost to provide assured access to space may increase.

General EBERHART. Yes, we are concerned and will continue to assess the situation to do what is right for our national security and the vendors involved.

SPACE-BASED RADAR

33. Senator ALLARD. Secretary Teets and General Eberhart, what factors give you confidence that technology and cost challenges can be met successfully to achieve the 2010 time frame for first launch of a SBR satellite?

Secretary TEETS. First, since 1992 over $500 million has been spent by the Air Force, the NRO, and other agencies to assess Space-Based Radar utility and develop enabling technologies. The Discoverer II program, in particular, accomplished significant technology risk reduction and worked detailed system engineering solutions for the now-canceled two-satellite demonstration. Second, there are many other operational or research programs ongoing with technology that directly translate to a future Space-Based Radar. Some examples include both airborne and space-based data dissemination and exploitation technology work by Air Force labs, FFRDCs, the NRO, and others. Third, OSD led an in-depth study over 7 months including services, the intelligence community, and other agencies resulting in the Deputy Secretary of Defense-signed SBR Roadmap (22 Feb 02). In the roadmap process, the team carefully assessed the current technology readiness levels versus where we need to be to deploy SBR, and developed plans to ensure we do everything needed to properly mature the technology. In addition, the NRO has continued work on radar payload technology since Discoverer II cancellation, and we've seen some excellent and promising results not only with the potential radar payload performance, but also in areas of affordability and producibility. Over time we've also continued to use independent teams to check our work and ensure we're doing everything possible to maximize future SBR program success.

General EBERHART. Our confidence is based on the promising results of technology investment in prototype radar payloads and the DOD's experience with past programs such as Discoverer II. Preliminary data supports the performance and cost estimates that have been developed for SBR.

34. Senator ALLARD. General Eberhart, what progress has been made in integrating SBR into a coherent architecture including national assets and airborne platforms?

General EBERHART. At the present time, we are working with key stakeholders in the Department of Defense and the Intelligence Community to develop a Concept of Operations to fulfill warfighter requirements. In addition, we have broadened the scope of traditional pre-acquisition activities to plan for an integrated system of systems solution that effectively incorporates existing and future airborne collection platforms, as well as national assets.

SPACE SURVEILLANCE

35. Senator ALLARD. Secretary Teets, space surveillance is a key element of space control, and space control is taking on increasing significance as U.S. reliance on space increases over time. An August 2000 study of the space surveillance system found that current space surveillance is not adequate to meet military needs, and that the system today is a collection of dedicated, contributing, and collateral components that are not adequately integrated as a coherent architecture. Are you satisfied with current space surveillance capabilities? What improvements to current capabilities would you prioritize?

Secretary TEETS. Today's space surveillance capabilities do not meet national requirements and need to be improved. We cannot at this time fully support the other space control missions of offensive counterspace (OCS) and defensive counterspace (DCS), nor can we fully support other customers who rely on space surveillance data for their own space operations (i.e., NASA).

We are working to transform space surveillance operations to broaden space situational awareness (SSA) operations. SSA not only includes traditional space surveillance, but also space reconnaissance, space intelligence, and space weather functions.

The first and most important need is to prevent an upcoming gap in space-based space surveillance. Currently, the Mid-course Space Experiment/Space-Based Visible sensor (MSX/SBV) is expected to end life in 2005. The follow-on to this system, the Space-Based Space Surveillance (SBSS) System, is not scheduled for Initial Operational Capability until 2010—resulting in a 5-year gap which will degrade current SSA capabilities and result in the loss of crucial operational experience in space-based operations. We are working hard to accelerate SBSS.

Other necessary improvements include the sustainment of critical elements of the current Space Surveillance Network (SSN), particularly some of our ground-based radars that provide very precise observations. Many of these assets are over 30 years old and need to be modernized. The development and integration of improved Space Control C^2 and data fusion of information (like space intelligence) into SSA is also a critical need.

36. Senator ALLARD. Secretary Teets and General Eberhart, is the National Security Space Architect examining future space surveillance architectures?

Secretary TEETS. The National Security Space Architect (NSSA) examined the future needs of space surveillance as part of a 1997 Space Control Architecture study. This effort eventually led to the August 2000 Space Surveillance Task Force study report cited in Question #35. The NSSA also began an effort in 2001 to develop a top-level operational architecture specifically for Space Situational Awareness (SSA), which will include space surveillance. In addition to this work, the Space Situational Awareness Integration Office (SSAIO) was established in 2001 as the executing office for the Air Force, the lead service system integrator for SSA as directed by ASD(C^3I). The SSAIO has developed a detailed methodology on how to evaluate future space surveillance system architectures and is preparing to conduct evaluations of mid-term capabilities.

General EBERHART. Yes, the NSSA is conducting a study of SSA to be completed later this year. This study will define an architecture that leverages all space-based surveillance, reconnaissance, and intelligence activities to provide an SSA common operating picture.

SBIRS-LOW

37. Senator ALLARD. General Eberhart, do you believe that SBIRS-Low could contribute to the space surveillance mission? If so, how?

General EBERHART. Yes, we believe SBIRS-Low will be a contributing sensor to the Space Surveillance Network. Specifically, it will collect infrared and visible signature data to identify, track, and monitor space objects.

SATELLITE CONTROL NETWORK

38. Senator ALLARD. General Eberhart, commercial antennas could potentially be used to supplement (or even potentially replace some) Air Force owned and operated equipment. Limited demonstrations of commercial antennas have been done and have demonstrated the feasibility of the concept. Further demonstrations have not been funded. Are you concerned about the obsolescence of the satellite control network and do you believe that commercial antennas could supplement Air Force capabilities in this area?

General EBERHART. Yes, we are concerned about the aging Air Force Satellite Control Network. However, we have implemented a long-term improvement and modernization program that includes commercial off-the-shelf technology. This program will expand the network's operational capabilities and high level of performance well into the 21st century.

In addition, commercial networks do not meet our critical operational requirements, such as timing, accuracy, and high-power commanding. Recent demonstrations of commercial antennas were not as promising as we hoped.

INTEGRATION OF BLACK AND WHITE SPACE

39. Senator ALLARD. Secretary Teets, the Space Commission recommended that NRO and Air Force space programs be appropriately aligned. Part of this recommendation included the designation of Under Secretary of the Air Force as the Air Force space acquisition executive as well as the director of the NRO. That has happened. But, the most recent organization chart shows Under Secretary Teets at the top of an NRO (black space) structure and an Air Force (white space) structure, with an integration office in between them—something that looks like a stovepipe connecting two stovepipes. Would you describe in more detail how you intend to achieve this integration and how the organization you have established will support that integration?

Secretary TEETS. The Space Commission report indicated that the integration of military space efforts and the NRO was a desired goal, but that it was a far-term goal and should only happen after certain changes had occurred within the Air Force—namely the establishment of a "cradle-to-grave" construct and the creation of a "space professional cadre." In the meantime, the NRO will need to do the work that they do, and the Air Force will need to do the space-related efforts they are responsible for. That being said, I have organized my top level staff to move forward and directly facilitate what I believe was the intent of the Space Commission in terms of integrating "black" and "white" space. With the combining of both the Director of the NRO and the Under Secretary of the Air Force, there is now one person with the clear authority to make the space programmatic decisions across Air Force and NRO space programs. The role of the office you mentioned, NSSI, as well as my two deputies is to work across existing organizations of the Air Force and the NRO such that, while there are multiple decision execution or implementation arms (i.e., the Air Force's Space and Missile Systems Center and the NRO's Directorates) at the top, we can function as a single coordinated National Security Space entity.

QUESTIONS SUBMITTED BY SENATOR BOB SMITH

SPACE CONTROL

40. Senator SMITH. Secretary Teets, according to General Eberhart, space control, the ability to protect one's own space assets while denying an adversaries use of in-orbit resources, is "still at idle. It's time to move that up." Our reliance on space is unquestioned and fully understood by the world. General Franks in his February 7 statement in front of the Senate Armed Services Committee said the use of unmanned aerial vehicles, precision guided munitions, and C^4ISR) systems proved to be "very effective" in the prosecution of what he considered to be "the most accurate war in the history of the United States." All of these assets rely on space systems, such as global positioning satellites and the satellite communications network, to operate and function. Without them, we would have had a much rougher time prosecuting the war, and undoubtedly more lives would have been lost. Our dependence on space is not limited to defense purposes, however. Our economy is increasingly

dependent on space. Our enemies understand this, and it is only a matter of time before an adversary figures out how to deny us the use of these systems, such as a pop-up nuclear or large conventional explosion in space. Our defenses against this are limited at best, and more focus is needed. What is being done to ensure not only that we have the assets to ensure our vulnerabilities are minimized, but also to ensure we have an overt deterrent to others trying to develop such systems?

Secretary TEETS. Measures being taken to defend against attack of U.S. space systems are in two space control submission areas: defensive counterspace (DCS) and space situational awareness (SSA). Planned developments will provide satellite operators, users, and decision-makers the information to respond to unintentional interference or deliberate attack against U.S. space systems. We are now developing the rapid attack identification and reporting system (RAIDRS), integrated DCS capabilities addressing threat detection, identification, location/classification, and attack reporting. RAIDRS will initially consist of distributed terrestrial elements, future satellite-hosted sensors, centralized data fusion and analysis, and communications infrastructure.

RAIDRS will work in concert with SSA assets to allow us to timely detect space events and respond defensively. Expanded SSA capabilities will include migration of space surveillance to space basing, inspection of space-based objects, and more responsive interfaces to the national intelligence community to locate and characterize terrestrial threats. The combination of enhanced SSA and focused threat detection and warning through RAIDRS will enable satellite developers and operators to effectively employ a full range of defensive measures in response to interference or attack on our systems. These defensive measures include, but are not limited to, maneuver to avoid threats, anti-jam capabilities, satellite hardening, sensor filters, redundant communications, and electronic warfare defenses.

We are exploring the feasibility of requiring satellite buyers to include attack detection capabilities at their ground sites and host sensors on board satellites that support critical missions. In addition, we are evaluating the utility of fielding escort satellites capable of detecting threats and actively defending our space assets. While terrestrial-based interference or attack on our satellites can be accomplished with modest capabilities, attacking our space assets from space is a very expensive and high technology capability, requiring significant resources by any adversary. Developing comprehensive defensive capabilities will deter nations from committing high value resources to an attack that would have a low probability of succeeding.

SPACE FORCE APPLICATION

41. Senator SMITH. Secretary Teets, to date, space has been relegated to a support role. The "weapons in space" issue has paralyzed the country and prevented it from moving out on systems which would protect the American people. A key component of boost-phase defense is the space based laser, which was on course for a 2012 demonstration. Recently the Department cut the program's budget from $200–$300 million per year to $50 million per year, effectively killing the program. The program was cut in fiscal year 2002 ($170 million to $50 million) as a bill payer for other issues. There has been no overt congressional opposition to the program. Why didn't the administration defend the program and restore it to its previous levels in the President's budget?

Secretary TEETS. The Space-Based Laser program is run by General Kadish at the Missile Defense Agency and I would ask that any programmatic questions be presented to him.

INDUSTRIAL BASE

42. Senator SMITH. Secretary Teets, the cost of entry for companies into the space arena is very high, and the current companies seem to not be finished yet with consolidation. There are several new companies and with fewer and larger programs it is difficult for a smaller company to compete for the larger programs. Are you concerned that the large companies will starve innovation (which will ultimately have an adverse impact on the industry attracting new college graduates) in favor of maximizing the "bottom line"?

Secretary TEETS. Space industrial base issues are always a concern. Space systems are expensive and the risks and consequences of failure are substantial. The government must work to mitigate risks, control our costs, and meet operational needs. It can often be a fine line between prudent risk mitigation and the elimination of innovation. I think the real area that is ripe for small and/or new companies with innovative ideas for space-related applications is space science and tech-

nology. In fact, the small business innovation research program is intended to cultivate such companies. Secretary Rumsfeld has, in his fiscal guidance to the Department and in his 18 October 2001 memo regarding Space Commission implementation, made it clear that space-focused science and technology is a high priority area for this Nation. Opportunities and avenues for truly promising ideas are there.

NORTHERN COMMAND

43. Senator SMITH. General Eberhart, I understand that DOD is reorganizing the joint warfighting commands to add the new "Northern Command" for homeland defense. I understand that the Unified Command Plan and the details of the reorganization are not out yet; however, can you give me any insight into how roles and responsibilities will change among U.S. Space Command, NORAD, and Strategic Command and how are we going to maintain our focus on the space and missile defense missions in our shuffle to take on the important homeland security mission?

General EBERHART. Unified Command Plan 2002 does not contain new mission requirements or change the focus of NORAD, U.S. Space Command or U.S. Strategic Command. It does establish a new unified command, U.S. Northern Command, which will be responsible for U.S. homeland defense and support to civil authorities.

GPS

44. Senator SMITH. General Eberhart, with the increasing reliance on GPS, both in terms of our military and in the civilian sector, it seems we should be very clear in our minds where we are headed with GPS-issues such as frequency protection, military versus civilian control, signals, power, accuracy, international involvement, etc. There doesn't seem to be a clear plan for the future of GPS and how it will continue to support national security objectives while the commercial use of the system expands. Are we working on one, and are we making sure we focus on all elements of the system, both long- and short-term?

General EBERHART. U.S. Space Command has worked with the Air Force to ensure GPS will continue to meet the many needs of the military, civilian, and commercial communities for the short- and long-term. For example, to address immediate requirements, we are currently launching two to three Block II-Replenishment satellites per year. Next year, we will launch the first "modernized" replenishment satellite that will feature new signals for civilian and military users.

In approximately 2009, we will introduce the new Block III GPS satellite which will feature improved accuracy, new cross-link commanding, and have an additional antenna to provide increased power. We will also improve the ground control element of GPS constellation.

SBIRS-LOW

45. Senator SMITH. General Eberhart, the SBIRS-Low has been plagued with overruns and poor program management, both on the government and the contractor sides. "Requirements creep" is always difficult on space programs, and is a cause of the problems on SBIRS-Low. In addition, the Department is mulling a potential shift in strategy on SBIRS-Low which would combine the two currently competing prime contractors into a single team. How will you ensure space requirements are set and don't creep and will there be a "Space Requirements Oversight Council" that will validate requirements?

General EBERHART. We will continue to use the Joint Requirements Oversight Council to validate warfighter requirements for space-based assets.

46. Senator SMITH. General Eberhart, what are the prospects that a "national team" will be able to produce a better team than a winner of the competition, and how are you going to ensure the government gets a "good deal" from the resultant business/contractual arrangement?

General EBERHART. We defer to the Missile Defense Agency, since they have the lead on SBIRS-Low acquisition.

[Whereupon, at 4:27 p.m., the subcommittee adjourned.]

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2003

WEDNESDAY, APRIL 10, 2002

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

DEPARTMENT OF ENERGY'S ENVIRONMENTAL MANAGEMENT PROGRAM AND THE NATIONAL NUCLEAR SECURITY ADMINISTRATION'S DEFENSE PROGRAM AND OTHER WEAPONS ACTIVITIES

The subcommittee met, pursuant to notice, at 2:34 p.m. in room SR–222, Russell Senate Office Building, Senator Jack Reed (chairman of the subcommittee) presiding.

Committee members present: Senators Reed, Inhofe, Allard, and Sessions.

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

Minority staff members present: L. David Cherington, minority counsel; and Mary Alice A. Hayward, professional staff member.

Staff assistants present: Andrew Kent and Thomas C. Moore.

Committee members' assistants present: Elizabeth King, assistant to Senator Reed; Peter A. Contostavlos, assistant to Senator Bill Nelson; John Gastright, assistant to Senator Thurmond; and Douglas Flanders, assistant to Senator Allard.

OPENING STATEMENT OF SENATOR JACK REED, CHAIRMAN

Senator REED. Let me call the hearing to order. The Strategic Subcommittee meets today in two panels to discuss the Department of Energy's Environmental Management (EM) program and weapons activities at the National Nuclear Security Administration (NNSA). The witness on the first panel is Ms. Jessie Roberson, the Assistant Secretary of Energy for Environmental Management. Secretary Roberson, welcome.

The witnesses on the second panel will be Dr. Everet Beckner, the Deputy Administrator for Defense Programs, and Mr. Ralph Erickson, the Associate Administrator for Facilities and Operations, both at the NNSA.

In the past, the Strategic Subcommittee has had the opportunity to discuss EM programs and weapons activities in two separate hearings. At the EM hearing, we would ususally have the oppor-

tunity to hear from the major prime contractors responsible for implementing the DOE cleanup programs.

In past hearings we have had the opportunity to hear from the operating contractors at the NNSA weapons plants and the directors of the three laboratories. Unfortunately, the committee's schedule this year does not permit us to hear from the contractor-operators and lab directors of these facilities in person. Nevertheless, it is important that we hear from these contractors as they are charged with implementing the various programs that we will discuss today.

For that reason, I would like to extend to these contractors the opportunity to provide testimony to be included in the subcommittee's record of this hearing. Several NNSA contractors have submitted testimony for the record already. The testimony that we have will be included in the record. Any testimony from any other NNSA or EM prime contractors will also be included in the record provided such testimony is submitted by 6:00 p.m. Monday.

[The information referred to follows:]

PREPARED STATEMENT BY JOHN C. BROWNE

Thank you Mr. Chairman and distinguished members of the Strategic Subcommittee for the opportunity to submit this report on the status of national security programs at Los Alamos National Laboratory. Los Alamos is one of three multi-program scientific institutions supported by the Department of Energy's National Nuclear Security Administration (NNSA), and has been operated by the University of California since its inception in 1943. Seventy percent of the work at Los Alamos supports the NNSA mission. Eighty percent of our work is directly related to national security. All of our work stems from our historic public service and national security mission. We appreciate the support this subcommittee has given us in carrying out our mission.

The new threats of the 21st century—worldwide terrorism and the daunting possibility of the use of weapons of mass destruction—cannot be met by nuclear deterrence alone. With the formation of the Office of Homeland Security and the issuance of the Nuclear Posture Review and the Quadrennial Defense Review, our country is developing new national security policy directions for the 21st century that will require a broad array of scientific and technological innovations in the coming decades. The NNSA weapons laboratories will provide the Nation with many of the needed science and technology capabilities that will support our Nation's needs in nuclear deterrence, conventional defense and homeland security.

Our stockpile stewardship mission is directly linked to the urgent national security priorities of our country. We are aligned with the new nuclear strategy set forth in the 2001 Nuclear Posture Review (NPR) which outlines a deterrence strategy based on a new triad of non-nuclear and nuclear strike capabilities, a strong defense capability, and a responsive defense infrastructure. The active support of the new triad by healthy and responsive national laboratories, as well as the DOD, will be key to the success of this deterrence strategy. We are committed to:

- Ensuring the safety, reliability, and responsiveness of the U.S. nuclear-weapon stockpile;
- Reducing threats to U.S. and global security, with a special focus on countering proliferation and possible terrorist acquisition, threats, and use of weapons of mass destruction; and,
- Providing technical solutions to long-term national security problems in infrastructure vulnerabilities, energy, environment, and health.

We are as focused and committed today to our mission and purpose as we were 60 years ago. The stockpile stewardship mission—maintaining the safety and reliability of the enduring nuclear stockpile without nuclear testing—is one of the most difficult technical challenges this Nation has ever attempted. As our nuclear weapons age beyond their design lifetimes, Directed Stockpile Work—surveillance, assessment, and response—will increase. Certification of nuclear weapons in an environment without nuclear testing requires the best science in modeling and simulation, dynamic material behavior, special nuclear materials and explosives, and experimentation. Therefore, our weapons activities must focus on ensuring a balanced

and sustainable stewardship—between direct stockpile work and the campaigns that support the underlying science needed to certify stockpiled weapons and to meet future nuclear weapon requirements—for this decade and beyond.

To meet the technical and operational challenges posed by our demanding mission, last September I appointed a new nuclear-weapon program management team and restructured the laboratory to be more focused on execution and product delivery. There are several structural changes in the NNSA being implemented in the field and site offices. These changes should strengthen our partnership with the NNSA, at all levels, which already has improved markedly under General Gordon's tenure. The University of California (UC) has appointed a new vice president for laboratory management and has increased its oversight and involvement in improving laboratory performance and operations. We are operating under a new 5 year contract between UC and DOE/NNSA that requires us to perform against rigorous technical and operational standards that will serve the Nation well.

We have made great progress during this past year. I will highlight some major accomplishments in our Stockpile Stewardship Program, our threat reduction program, and in our operations. I will also review key issues and challenges with respect to our mission that face us in the future—and to the science, the workforce and the infrastructure that underpin that mission. In the attached addendum, key elements of our nuclear weapon and threat reduction programs are addressed in greater detail.

PROGRESS AND ACCOMPLISHMENTS: HIGHLIGHTS

I. Stockpile Stewardship Program

In 1995, we were tasked to conduct a stockpile stewardship effort to sustain the enduring nuclear-weapon stockpile without nuclear testing. Sustaining the nuclear deterrent under these conditions continues to pose a grand challenge. It is my primary responsibility to position the laboratory and provide the people and tools to ensure that we are equal to this challenge. The requirements of stockpile stewardship are technical, determined by the science of nuclear weapons, by the processes of aging affecting both the workforce and the weapons, and by required levels of confidence. It is essential that we meet these requirements. I would like to highlight a few of our achievements in meeting these requirements.

Annual Certification. For the sixth consecutive year, I have been able to certify to the Secretaries of Defense and Energy that the five Los Alamos designed weapons (the B61 family, W76, W78, W80, and W88) in the U.S. nuclear stockpile remain safe and reliable and that a nuclear test is not required at this time to resolve any of the issues that exist for these weapons. Although I am concerned about a growing number of issues identified by our ongoing surveillance activities, to date we have been able to resolve most of the issues through assessments, changes in operating conditions, or refurbishment plans. In the past some of these issues would have required nuclear tests to resolve. The challenge we face is to have certification tools and trained people adequate to address these issues.

We have strengthened our certification approach each year since beginning this process in 1996. In the past year, Los Alamos and Lawrence Livermore National Laboratories reached agreement on an approach for certification that utilizes similar methodologies while maintaining independence for peer review purposes. In addition, we are planning to phase in internal "red teams" or "fresh-eye teams" at Los Alamos designed to look for the issues that might have been overlooked by the responsible warhead design and refurbishment team. Reports from both teams will be submitted to me for incorporation into my annual assessment of the stockpile.

Pit Manufacturing and Certification. One of our highest priorities at Los Alamos National Laboratory is to re-establish the Nation's capability to manufacture plutonium pits, the heart of nuclear weapons. The W88 has been selected as the crucial prototype for restoring the Nation's nuclear manufacturing capability. Producing a pit for a nuclear weapon involves two distinct but intertwined activities: manufacturing and certification. Significant progress in this program has been made in this last year. We are well along in establishing a limited manufacturing capacity for pits. Eleven developmental units have been produced to date. We are on schedule to deliver a certifiable W88 pit, defined as one that meets all manufacturing requirements and specifications, by April 2003.

Even though we will provide a key capability in a timely fashion, the laboratory will not have sufficient capacity to meet envisioned future pit production requirements. We support NNSA's pit production strategy, which is based on an assessment of pit lifetime and numbers of weapons projected in the stockpile, to reestablish industrial-scale pit production in the longer term.

Certification of the pit is an extremely challenging process that requires both highly specialized equipment and expertise. Los Alamos has identified a series of laboratory and sub-critical experiments that are designed to test and validate our computer simulations that will be needed to ensure that the pit will perform as designed. Based on improved planning and better certification methodology, we have been able to move up our schedule for certifying these pits for war reserve use from the previously scheduled date of 2009 to 2007.

Directed Stockpile Work. In addition to our pit manufacturing responsibilities, we are also responsible for neutron target tube loading, detonator fabrication for all the weapons in the stockpile, Beryllium component manufacturing, pit and valve surveillance testing, and high fidelity mock pits for joint test assemblies (JTA) used in flight testing.

In the area of stockpile Life Extension Programs (LEPs), we began engineering development for the Navy's W76 warhead and will proceed toward production development and certification with the first production unit (FPU) scheduled for 2007. Evaluation of the condition and life expectancy of the materials in the nuclear explosive package is being addressed. A major refurbishment is planned to support the extension of the lifetime of this warhead to 2042. We also have finalized plans with NNSA, Pantex, and Y–12 to begin refurbishing canned subassemblies of the B61 Mod 7 and 11 in 2006. In support of the Lawrence Livermore National Laboratory W80 Life Extension Program, we are developing the Acorn gas transfer system with the Sandia-California site. With Sandia, we have completed the W80 baseline program and continue to support knowledge transfer to LLNL.

As part of the enhanced surveillance program, Los Alamos continues to be a national leader in materials characterization and aging studies. We are developing non-destructive technologies for surveillance and diagnostics on components and systems that will help us improve our understanding of nuclear weapons aging.

Advanced Simulation and Computing. The Advanced Simulation and Computing (ASC) program of the NNSA is an essential element of the nuclear-weapons program. The objective is to provide greater computing power and to develop new computational models that will allow weapons designers and other nuclear weapons experts to use validated modeling and simulation to assess changes in the stockpile to determine if the existing weapons remain safe and reliable without nuclear testing.

We continue to make rapid advances in the ability to simulate nuclear explosions faster and with greatly increased detail. During this past year, we completed the first three-dimensional simulation of a full nuclear weapon system explosion using the LLNL 12 TeraOps White computer. This calculation represents the first time that we have been able to compute a fully-coupled primary and secondary explosion to analyze weapon performance. It represents a breakthrough for the program and unprecedented detail for designers and analysts.

The Strategic Computing Complex (SCC) was completed on schedule and under budget. We are installing the first phase of 10 of the 30 TeraOps computers that were purchased for this ASC program. We are installing the full capability in "phases" in order to facilitate performance testing to connectivity requirements. The computer will provide the computing power required to run the new computational tools to support the Stockpile Stewardship Program mission. These new weapon-system simulations will replace the less-predictive legacy based models.

Hydrodynamic Testing. The nuclear weapon primary is the most critical component of the weapon. Understanding its performance is essential to confidence in the safety and reliability of the stockpile. Hydrodynamic tests of primary systems—non-yield experiments measuring the implosion characteristics of primary systems using simulated nuclear materials—enable us to evaluate some crucial aspects of nuclear weapon performance. Completion of the first axis of the Dual Axis-Radiographic Hydro-Test (DARHT) facility has enabled us to perform these tests with outstanding spatial resolution of the imploding surrogate pit. We performed five major hydro tests (four at DARHT) in the last quarter of fiscal year 2001 directly related to stockpile systems and in support of certification activities and plan six more later this year. Following commissioning and optimization of the second axis of DARHT, the facility will provide an enhanced diagnostic capability in fiscal year 2004. We are also continuing to develop proton radiography as an advanced capability in order to maintain our ability to certify the refurbished nuclear weapons, and to validate the predictive capabilities of next-generation designers.

Test Readiness. The Nuclear Posture Review has called for enhanced test readiness. We support test readiness through a number of collaborations with the Nevada Test Site. The most prominent collaboration is that of sub-critical, non-yield, underground tests that address key dynamic materials issues and exercise the infrastructure required, should a return to underground nuclear testing be needed. In

February, we conducted a successful collaborative sub-critical experiment in Nevada that yielded significant data. Although we see no reason to do a nuclear test today, we support General Gordon's direction to reduce the timescale required to resume nuclear testing as a prudent measure.

Advanced Concepts. The Nuclear Posture Review identified a need for the nuclear-weapons design laboratories to maintain their design expertise through the study of advanced concepts that could meet changing weapon requirements in the future. These studies include new and extended concepts (those that may have been developed and tested in the past, but not deployed). At Los Alamos, we have an NNSA-approved effort evaluating robust earth-penetrating weapons and a small study group looking at past R&D efforts that could be developed to meet changing national needs for nuclear deterrence. If the country requires a vigorous effort, we will need explicit support and funding for such advanced concepts.

II. Threat Reduction Programs: Non-proliferation, Counterterrorism, Homeland Security, and Defense Transformation

As a result of shifting national security priorities since September 11, the newly created Office of Homeland Security has been charged with protecting the United States from terrorist attack. We are strongly committed to supporting this effort and are participating with Lawrence Livermore and Sandia National Laboratories in an effort to defend the U.S. against nuclear, chemical, and biological terrorist attacks.

For example, our pioneering work on sequencing the human genome helped not only to develop technologies and breakthroughs, but also to grow a unique bioscience base at the laboratory. Because we had developed this capability, in the aftermath of September 11 we were able to play a key role in analyzing DNA of anthrax samples from the mail attacks. We were able to determine that these samples came from the common Ames strain, which assisted in efforts to respond to and treat victims. With Livermore, we deployed a biological agent detection system at the Salt Lake City Olympics. The multi-spectral thermal imager (MTI) satellite, developed in a joint project with Sandia National Laboratories, was re-deployed to help analyze the destruction and the dispersal of potentially harmful debris from the attacks on the World Trade Center.

We currently are working with Sandia to develop a critical infrastructure analysis capability, which derives from an innovative simulation and modeling approach originally developed for understanding and improving large-scale transportation networks. The National Infrastructure Simulation and Analysis Center (NISAC) will use this approach for government planning and analysis of vulnerabilities and responses to terrorist attacks.

We have provided the Nation with our expertise and special equipment for over 25 years in addressing threats of stolen or improvised nuclear devices through our NEST teams that continue to serve today. We also have been working since the early 1990s to help secure vulnerable nuclear materials in Russia, and have supplied technologies for decades to help the International Atomic Energy Agency and other governments control nuclear materials.

III. Laboratory Operations

During the past year, we rigorously continued our efforts to integrate safety and security into our programmatic work. We have fortified our physical and cyber security, and have increased security still further since September 11. Our guard force is over 500, with a large contingent of SWAT teams; our defense against a terrorist attack has been significantly enhanced; our special nuclear materials are in a safe and secure configuration. Because of the rapid pace of change in technology, maintaining an appropriate level of support for cyber security will be critical to our ability to meet the challenges presented by this continuing threat.

Laboratory safety performance has markedly improved compared to national benchmarks—total recordable incidents have decreased over the past 4 years from over 4.0 per 200,000 hours worked to less than 2.0 this year. In the same time frame, lost work day cases have decreased from over 3.2 per 200,000 hours worked to 0.90. Waste generation and radiation exposures have all been significantly reduced, and we have moved some of our transuranic waste off site from Area G to WIPP, although I believe that the DOE could increase the priority to ship more waste.

Project management improvements at Los Alamos continue to build on a strong foundation we established 3 years ago. We presently have three major construction projects that either have finished or will finish significantly ahead of schedule and under budget.

MAJOR CHALLENGES: ENSURING THE FUTURE

I. Science: Achieving Program Balance

The biggest challenge facing the Stockpile Stewardship Program is developing a balanced program within the budgets provided by Congress. The balance that must be struck is between warhead life extension programs, infrastructure maintenance and recapitalization, sustaining a preeminent capability in weapons-relevant science and experimentation, test readiness, and exploration of advanced concepts. The Future Years National Security Plan (FYNSP) that NNSA submitted to Congress this year is a good start toward providing a process for achieving this balance. At present, scientific investments needed to ensure that the next generation of weapons designers will be able to certify the stockpile in future decades are under stress due to the focus on the refurbishment of three weapons systems in the coming decade. The predictive assessment tools currently available to certify these planned LEPs are not yet adequate for the scope of these refurbishments. The addition of new production facilities, such as the Modern Pit Facility, will add to that stress unless the future year budgets accommodate such large expenditures.

II. Threat Reduction

NNSA, working with LANL and the other NNSA Laboratories, has had many successes with the existing Chemical and Biological National Security Program (CBNP), but the important research in this area needs to be expanded to include a broader range of biological threats. On the nuclear side of the equation, however, no CBNP-like program currently exists. Because of the threat posted by nuclear and radiological terrorism, we believe that creation of a broad-based nuclear threat program is critical to meeting the challenges in this area. A new program within NNSA could be modeled upon the already successful CBNP program. Lastly, in order to tie all of these activities together, I believe that NNSA should take on a major responsibility for homeland security research and development.

III. Workforce

A large number of personnel at Los Alamos are nearing retirement, and it is critical that we effect the transfer of technical and programmatic knowledge that they embody. We must attract and retain the next generation of stockpile stewards. We are planning to hire approximately 1,000 employees during fiscal year 2002—600 to meet workload requirements and 400 to address attrition. We are aggressively recruiting, and are strategically focusing these hiring efforts to attract 80 percent of new hires at the entry-level. To date, this fiscal year we have hired over 300 new employees. To attract the most outstanding scientists, engineers, technicians, and support personnel we must focus our efforts on sustaining and improving the quality of life for our employees. We must redouble our efforts in areas that impact our ability to attract and retain a diverse and high quality workforce—by ensuring that we retain our ability to pursue cutting edge science and research, by improving our infrastructure and facilities, and through a continued focus on and investment in education, the environment, and economic development.

Laboratory Directed Research and Development (LDRD) is a key tool that I have available to help attract and retain the best scientists and engineers. LDRD is a well-managed program as indicated by a recent GAO audit of the program. I strongly recommend that Congress continue its strong support for LDRD. Continued support of the Los Alamos schools and Los Alamos National Laboratory Foundation also is key to employee recruiting and retention, as well as to education and economic development in the region.

IV. Infrastructure

We continue to experience deterioration of our infrastructure and facilities, which may serve to undermine our long-term ability to fulfill stockpile stewardship objectives. We have developed a Ten Year Comprehensive Site Plan that NNSA has approved as a guide for prioritizing maintenance and facility replacement at our site. In addition, I have chartered an external review of our facilities and infrastructure to determine where and how we might shrink our footprint for today's mission.

In particular, we need your support for the replacement of our 50-year-old Chemistry and Metallurgy Research (CMR) building, which is planned for relocation within an Integrated Nuclear Complex at our TA–55 site. We strongly support General Gordon's 10 year Facilities and Infrastructure Revitalization Initiative. Congress provided an initial appropriation last year ($200 million), but this will continue to be a critical issue in fiscal year 2003 and the outyears. Without your continuing and strong support of this initiative, we will not be able to carry out either the manufacturing or certification efforts for the stockpile.

CONCLUSION

For more than a half a century, the Nation's investments in Los Alamos have helped ensure our National security. We face ongoing and new challenges—a new Nuclear Posture with fewer deployed nuclear weapons, certification of an aging stockpile without nuclear testing; the need for a balanced program ensuring science in our programmatic endeavors; and the need for new technologies to address nonproliferation, threat reduction and counter-terrorism. We are committed to meeting these challenges to our Nation's security.

In conclusion, I would like to thank you for your past support. Your continued support is critical to our ability to meet the technically demanding and vital national security challenges we face today and in the future.

ADDENDUM TO THE PREPARED STATEMENT BY JOHN C. BROWNE

The following information supplements the laboratory report submitted by Director John C. Browne of Los Alamos National Laboratory (LANL).

STOCKPILE STEWARDSHIP

The purpose of the NNSA Stockpile Stewardship Program (SSP) is to maintain high confidence in the continued safety and reliability of the Nation's nuclear weapons arsenal without returning to underground nuclear testing. SSP consists of several integrated sets of activities: surveillance, life extension, manufacturing, design capability, infrastructure revitalization, workforce regeneration, and certification. Each of these depends on and contributes to the others and success requires that there be a reasonable balance among and between them—suggestions that the SSP should be skewed to place significantly more emphasis on one over the others put the overall success of SSP at risk.

As the gap between the time when the last nuclear test was conducted and the date of each annual certification grows, our ability to successfully execute the stockpile stewardship mission becomes more difficult. We will not be able to do the job if we do not reverse the aging of our infrastructure or the aging of our workforce. Nor can we expect success if we do not systematically improve the scientific and technical tools and machines that allow weapons technical experts to advance their understanding through experimentation, computation, and simulation. These issues are discussed in greater detail below.

Surveillance

Surveillance occurs year-round on all weapons systems in the active stockpile, including the five systems for which Los Alamos is responsible: B61, W76, W78, W80, and W88. Its purpose is to identify indicators of existing, or impending, conditions that could impact safety, reliability, or performance, with the goal of developing a predictive capability. This is accomplished by using a suite of tests, including:

- Functional testing of selected components;
- Destructive analysis of components to identify defects or failures in individual nuclear and non-nuclear parts;
- Flight testing of warheads in which nuclear material has been removed and replaced with precision instrument packages that match the critical features of weight and moment of inertia; and
- Nondestructive evaluation of selected components.

Results of these tests are combined with data collected over the life of each weapon system for analysis by nuclear weapons experts who use expert judgment to determine impacts. Defects from aging, design or production that are revealed through surveillance activities are formally addressed via "significant finding investigations" (SFI).

Significant Finding Investigations

SFIs are conducted in accordance with formal, NNSA-established protocols whenever a condition is found in a stockpiled weapon that does not meet the original weapon condition or design intent. Multi-disciplinary expert review teams begin by assessing the potential and immediate impacts of the identified condition. The results of this initial assessment determine the priority assigned to resolution of the SFI. Safety-related SFIs automatically receive top priority.

On average, LANL conducts about 500 surveillance tests per year on weapons drawn from all stockpiled systems. We expect to conduct 650 surveillance tests in fiscal year 2003. The number of weapons systems in the nuclear stockpile is the primary basis for selecting the level of surveillance activity; the number of individual

weapons is a secondary consideration. Thus, surveillance activity is not projected to decline as a result of the Nuclear Posture Review and its goal to achieve significant reductions in the number of weapons in the nuclear stockpile.

The ratio of SFIs in LANL-designed systems to surveillance tests since the end of underground nuclear testing is 65:5000. At the current time, LANL has 30 open SFIs, ranging in age from 1 to 65 months; none of these are safety-related. LANL's average time to complete and close an SFI is 34 months, depending on the extent to which large-scale experiments such as hydrodynamic tests or detailed computer simulations are required.

SFI protocols provide a flexible, risk-based approach that assures immediate attention and highest priority for real or potential safety-related problems and provides that other SFIs will be prioritized with other ongoing SSP work. This approach assures the best use of available resources. Significant acceleration of the rate at which SFIs are completed and closed would require considerably increased funding, or significant reductions in funds currently devoted to other SSP work, or both. Absent specific evidence that the safety, reliability or expected performance of any stockpiled weapons system is in doubt, LANL would not advocate such acceleration.

STOCKPILE LIFE EXTENSION PROGRAMS

Even in storage, nuclear weapons have dynamic properties that cause changes and deterioration of some parts and components over time. To address these changes and to assure continued safety and reliability, NNSA, the Department of Defense (DOD), and the Nuclear Weapons Council (NWC) have agreed on specific life extension programs for selected weapons systems.

Two LANL-designed systems—the B61 and the W76—have been designated for life extension programs. Based on a process (Phase 6.X) that mimics the management framework for designing and building nuclear weapons and that was used by the DOE Office of Defense Programs (now NNSA/DP) for over 40 years, both systems will be refurbished.

B61 LEP

Refurbishment of the B61 Mods 7 and 11 canned subassemblies is scheduled to begin in 2006. A feasibility and cost study was authorized last year. Planning, risk assessment, scheduling and cost estimating are in progress at LANL; material tests are being performed at Y–12 and at Los Alamos. The Kansas City Plant will evaluate the manufacture of new components with substitute materials. The Certification Plan, Test and Evaluation Plan, and Weapon Design and Cost Report are scheduled to be released in July 2002. The B61 LEP is on track to meet its scheduled commitments.

W76 LEP

Extension of W76 warhead life through 2042 has been established by the Department of the Navy. A comprehensive evaluation of the condition and life expectancy of the materials in the nuclear explosives package has been completed. Engineering development was begun last year and will continue through production development and certification. LANL's W76 LEP is on track to meet its scheduled commitments.

Manufacturing

In addition to its responsibility for the B61 and W76 LEPs, LANL contributes to the overall sustainment for all nuclear weapons via various manufacturing activities. These include manufacture of beryllium parts in the new Beryllium Technology Facility at LANL, which was qualified last year and is the only such capability in the country. LANL also makes tritium-loaded neutron sources for Sandia National Laboratories and supplies detonators to the Kansas City Plant. LANL also is responsible for producing joint test assemblies (mock pits for field test devices) as well as packaging and transportation materials for shipping explosives components. All manufacturing commitments have been met on time and to specification; we expect to continue this level of performance in fiscal year 2003.

The largest and highest priority manufacturing activity at LANL is pit manufacturing. LANL is on track to produce a certifiable pit for the W88 in 2003. "Certifiable" means that we can demonstrate that the pit has been fabricated according to design specifications, can be manufactured in a reproducible process, and that necessary quality systems are in place. Associated safety, security, and technical requirements are demanding. Specific processes include materials purification and alloying, machining, welding, and inspection. While we have made every effort to duplicate what was done in the original manufacture of pits at Rocky Flats, changes in environmental requirements and other factors have necessitated some modifica-

tions. More than 40 separate processes have to be documented and individually qualified.

To date, LANL has produced 11 pits for engineering development and testing purposes. The production schedule for the remainder of the year will include 3 more pits, 19 hemi-shells for testing and analysis, 4 subcritical components, and many small parts for certification.

Pit manufacturing is a multi-purpose effort that is designed to: (a) reestablish the capability to manufacture plutonium pits in limited (10- to 20-year) quantities; (b) prototype processes and configurations for use in a Modern Pit Facility; and (c) produce replacement pits for those destructively tested in the annual surveillance of the W88 system.

Taken together, all manufacturing activities at Los Alamos make LANL the second largest production site in the NNSA complex.

Certification

LANL and Sandia National Laboratories jointly share the responsibility for continually assessing the safety and reliability of the nuclear weapons for which we are the joint design agencies. Annually, LANL and SNL issue annual assessment reports that summarize the laboratories' knowledge about the health of our warheads. These reports, in conjunction with the annual assessment letters issued by the President of SNL, and myself to the Secretaries of Energy and Defense, constitute the formal evaluation of the safety and reliability of the nuclear weapons in the Nation's stockpile. This annual certification is currently being accomplished without nuclear testing and represents one of the most technically challenging tasks ever assigned to the laboratories. Although there are no guarantees that certification without testing will always be possible, I am confident today that the warheads remain safe and reliable.

A second certification responsibility that applies uniquely to LANL is the requirement to certify pits manufactured here. Pit certification involves three types of certification activities:

- Production certification—assurance that the pits are made according to design specifications;
- Engineering certification—assurance that the pit will endure the "Stockpile-to-Target-Sequence environments" encountered during storage, handling, and delivery; and
- Physics certification—assurance that the pit will produce the required yield to perform its mission.

Los Alamos has identified a series of laboratory and subcritical experiments that are designed to provide the necessary data, within the limits of non-nuclear tests that will allow our technical experts to certify the pit will perform as required. We have also obtained NNSA approval of a baseline change that will allow the certification date to move forward from 2009 to 2007.

WEAPON'S SCIENCE AND TECHNOLOGY

All of the foregoing accomplishments and potential for future achievements are attributable to and depend on the availability of a robust, continually advancing science and technology base. I am concerned that near-term and competing demands often appear to be more immediately urgent than new investments in science and technology and that the temptation to balance today's budgets by postponing such investments is often too great to resist. Three subjects are worth mentioning in particular:

- Advanced Simulation and Computing (ASC);
- Hydrodynamic Testing (DARHT); and
- Proton Radiography (LANSCE, AHF)

Advanced Simulation and Computing (ASC)

The ASC program is intended to provide via computation and simulation the types of information previously obtained via underground nuclear testing—although it must be noted that ASC is not and is not intended to be a substitute to replace all testing. The objective of the program, which is a joint effort among the three NNSA Laboratories, is to provide by fiscal year 2005 validated 3–D, high-fidelity physics, full-system simulation codes required for engineering, safety and performance analysis of the stockpile.

At all three laboratories, we continue to make rapid advances in our ability to simulate nuclear explosions more quickly and with greatly increased detail. Earlier this year, LANL completed its first 3–D simulation of a full nuclear weapon system explosion. The calculation was run remotely from Los Alamos on the "White" ma-

chine at Livermore Laboratory. In about 4 months of around-the-clock computing, the simulation used more than 480 million cells on 1,920 of the White machine's 8,000 plus processors. Actual time on the central processing unit was the equivalent to computing continuously on a high-end home computer for more than 750 years. This first-ever 3–D simulation represents significant advances in visualization techniques as well as in computing power.

The ultimate objective of the ASC program is a 100-teraflop machine which we believe is necessary to provide timely weapon system simulations for the weapons design community. The next step beyond the White machine at Livermore is acquisition and installation of the 30-teraflop "Q" machine at LANL, which is currently underway.

Hydrodynamic Testing and DARHT

The most critical component of a nuclear weapon is the primary. Hydrodynamic tests—non-yield experiments that measure implosion characteristics—enable us to examine and more fully understand primary performance.

To date, one axis of the Dual Axis Radiographic Hydrodynamic Test (DARHT) facility has been completed and the second axis is scheduled for completion at the end of calendar year 2002. Commissioning of the second axis will take place during fiscal year 2003 and the full 2-axis capability will become available in fiscal year 2004. LANL has successfully operated the first axis for experimental purposes while continuing construction on the second axis, thus capitalizing on the initial investment of taxpayer dollars before the entire facility has been completed.

Using a single axis, DARHT has enabled us to image hydrodynamic tests with unprecedented resolution and clarity. The second axis will enable stereoscopic and time-sequenced views of hydrodynamic experiments, which are vital to supporting life extension programs, W88 pit certification, and validation of new modeling tools for simulating weapons safety and reliability. We expect that DARHT will be the primary test facility for the Stockpile Stewardship Program for the coming decade.

Eventually, however, advanced radiography capabilities will be needed to address future challenges of stockpile stewardship and to train and qualify the next generation of weapons designers who will be the first generation required to certify the nuclear stockpile having had no direct nuclear test experience.

Proton Radiography, LANSCE, and AHF

In a no-test environment, high-fidelity radiographic motion pictures of hydrodynamic tests will be the next best means of understanding weapon performance. The most promising technology—developed by scientists at Los Alamos via the Laboratory Directed Research and Development (LDRD) program—is proton radiography.

Proton radiography is already an operational tool at the Los Alamos Neutron Science Center (LANSCE) and has been used to make quantitative measurements of high explosive and other weapon relevant material behavior under extreme dynamic conditions. The capability is used by weapon designers and by other research collaborators on a variety of science undertakings. Proton radiography has already provided data that has influenced stockpile decisions. Its availability supports and strengthens LANSCE as the laboratory's flagship user research facility.

LANSCE just completed one of its most successful and productive running periods, operating with greater than 90 percent availability, 7 days/week, 24 hours/day. This rate of availability allowed LANSCE to support more than 200 experiments and over 300 users. In this respect, LANSCE is a key element in LANL's efforts to provide the intellectual capital that we will need over the next decade. By providing an exciting experimental tool to address basic science and stockpile issues, we are continuing to attract early-career scientists who bring fresh approaches to LANL's mission and related tasks. Historically, LANSCE has been the entry point for over 1,000 of our scientific and technical personnel.

Advancing radiographic capabilities to accurately image hydrodynamic experiments with sufficient detail to address long-term certification and assessment requirements is critical. A high-resolution radiographic motion picture of a hydrodynamic test provides us with a means of understanding weapon implosions. Data obtained from these experiments will provide the strongest technical justification for determining nuclear weapon performance, short of a nuclear test. High-energy proton beams delivered with flexible time-sequencing (tens of pulses) will provide an unprecedented capability to directly image very thick complicated geometries of surrogate weapon configurations. The most promising technology for establishing this capability through the creation of an Advanced Hydrodynamic Facility (AHF) is based on high-energy protons. Current efforts are underway to evolve the technically essential tool of radiography based on the current x-ray facilities to an AHF

based on protons. This work is essential to ensure that this critical prediction validation and precision design tool can be developed to maintain future nuclear-weapon expertise. An AHF designed to address design physics requirements in the 2015–2020 timeframe must be started soon. The Nation's investment in this area is both prudent and timely.

THREAT REDUCTION AND HOMELAND SECURITY

For decades, the U.S. has invested in tools to respond to a nuclear accident or guard against a surreptitious nuclear weapon threat and has provided help to the International Atomic Energy Agency and other governments to safeguard and control nuclear materials. Since the early 1990s, we have helped secure vulnerable nuclear materials in Russia. Dating to the early 1980s, LANL has conducted research in biological sciences—research initially supported via LDRD funding—which led directly to our ability, post-September 11, to support deployment of the Biological Aerosol Sentry and Information System (BASIS) system, developed with Lawrence Livermore National Laboratory (LLNL), and to provide forensic expertise in analyzing anthrax samples. Obviously, these efforts have taken on new and urgent priority since September 11.

NNSA has unique expertise, resident at Los Alamos, Lawrence Livermore, and Sandia National Laboratories, in nuclear, chemical, and biological technologies. That expertise has a long and successful history of supporting the intelligence community. In light of the new priorities and challenges following September 11, I believe that the NNSA Laboratories can and should play a central role in providing the science and technology for countering the terrorist threat and protecting the U.S. and its allies against weapons of mass destruction. Three key near-term challenges are particularly suitable for NNSA laboratory attention:

- Preventing and responding to threats of nuclear terrorism;
- Detecting and countering biological weapons; and
- Analyzing and protecting the Nation's critical infrastructure.

Programs already are underway in all of these areas, including our work in biological research and in the National Infrastructure Security Analysis Center (NISAC), which we are conducting in cooperation with Sandia National Laboratories.

Tightly controlling nuclear and radioactive materials continues to be the key to preventing terrorists or rogue states from creating radioactive dispersal devices—so-called "dirty bombs"—or nuclear weapons. The demonstrated global reach of terrorists and states that sponsor terrorism and their interest in weapons of mass destruction call for enhanced protection and management of nuclear and radioactive material inventories.

The goal of a strong, integrated, NNSA-led program is a global web of protection that:

- Ensures nuclear and radioactive materials are protected from theft and misuse;
- Responds to thefts of materials and threats involving nuclear and radioactive materials;
- Interdicts illicit trafficking in nuclear and radioactive materials;
- Detects and responds to non-nuclear-weapon states' attempts to produce or acquire materials for nuclear weapons programs;
- Promotes responsible management of existing military and civilian nuclear and radioactive material inventories; and
- Provides international confidence in the global systems of protection and control.

We should seriously consider a specifically defined role for the NNSA and its laboratories as principal R&D support to reducing the threat and securing our homeland from terrorists and their potential to use weapons of mass destruction whether nuclear, chemical or biological, against us. A streamlined, integrated approach to funding and program development that would ensure needed state-of-the-art technologies and a longer-term R&D program to address future contingencies would contribute significantly to our ability to effectively counter terrorist threats.

LABORATORY DIRECTED RESEARCH AND DEVELOPMENT (LDRD)

The LDRD program enhances the scientific and technical capabilities of national laboratories to meet long-term science and technology needs of the Nation. This means being able to explore new developments in all relevant areas of science quickly and develop ideas that eventually serve the policy objectives of the Federal Government. Throughout the history of the LDRD program the laboratory has focused

a significant portion of these resources on important scientific questions that underpin our nuclear weapons mission. LDRD investments have produced innovations essential to the ability of the laboratories to continue to accomplish our long-term programmatic missions. The program has a clear reputation for attracting high-caliber staff needed to meet the science and engineering challenges of stockpile stewardship, reducing the threat of weapons of mass destruction, homeland defense, and other missions. LDRD advances the frontiers of knowledge in scientific fields vital to the laboratories' missions, future, and effectiveness in serving the Nation. Some examples of success and clear benefit follow.

In the absence of testing for nuclear weapons, more detailed knowledge is needed on nuclear and other key materials contained in weapons systems in order to better understand how they age. We recently invested in work exploring issues such as the interactions of a plutonium surface with its surrounding environment. Such studies help us understand what might happen as a weapon ages, and also inform us about better ways to store nuclear materials or even to clean up environmental legacies from the Cold War. In addition, we have identified opportunities for additional research on nuclear materials and their properties, based on novel experimental approaches and new capabilities in materials modeling. The investment in these research topics does and will have direct impact on our ability to perform our mission.

In the area of countering the proliferation of weapons of mass destruction (WMD), the Nation faces potentially devastating new weapons systems based on chemical or biological weapons. LANL is seeking ways to detect the development or use of such weapons. Several new ideas have been proposed and funded to explore fundamental science and technology needed to combat the development and use of WMD. For example, researchers are exploring the fundamental mechanisms that produce virulence in pathogens. Understanding these mechanisms should enable us to design new sensors for rapid and early detection of the use of biological weapons.

FACILITIES AND INFRASTRUCTURE INITIATIVE

The entire nuclear weapons complex managed by the DOE/NNSA—the production plants and laboratories—is faced with serious aging problems that threaten our ability to carry out the stockpile stewardship mission. To continue to work effectively on these DOE/NNSA missions, our laboratory needs outstanding scientists and engineers working in state-of-the-art facilities. Our facilities have badly deteriorated buildings, roads, sewer systems; electrical power grid and other critical infrastructure are approaching 50 years old and are crumbling at an alarming rate. A dedicated and enduring revitalization effort is crucial for the long-term viability of this laboratory and the weapons complex as a whole.

We believe that there are three distinct areas that must be addressed in order to ensure infrastructure sustainability to meet our mission. Those three areas include: implementing formal facilities consolidation efforts and cost reduction initiatives; addressing high-priority facility maintenance backlogs; and investing in new construction projects, where appropriate and economically feasible. Each of these areas requires commitments to achieve positive results. Each area addresses safety and security needs and allows laboratory facilities to be sustainable over the next 20 to 40 years.

Ten or more years ago, the long-term outlook for the nuclear weapons complex and budget was uncertain, but the requirement to ensure the safety and reliability of the Nation's nuclear deterrent remains. During this period, Los Alamos and much of the rest of the nuclear weapons complex sacrificed continual reinvestment for the future in favor of short-term operational needs. With existing operating funds, we have been able to complete some urgent maintenance at our aging facilities, but this only scratches the surface. Only the utmost top-priority issues have been addressed, while the backlog of unfunded maintenance continues to grow as facilities age. The demands placed on the safety and security infrastructure from increased regulation and oversight have also stressed our resources. We are still running many buildings to failure.

We strongly support General Gordon's 10-year Facilities and Infrastructure Revitalization Initiative. Congress provided an initial down payment last year, but continued support is critical in fiscal year 2003 and beyond. Without continuing and strong support of this initiative, we will not be able to carry out either the manufacturing or certification efforts for the stockpile. Furthermore, we request your strong support for General Gordon's Five Year Defense Plan for NNSA at a level that can support the growing requirements and need for development of new tools and experimental facilities for certification of an aging stockpile.

PREPARED STATEMENT BY C. PAUL ROBINSON

INTRODUCTION

Mr. Chairman and distinguished members of the subcommittee, thank you for the opportunity to submit this statement. I am Paul Robinson, director of Sandia National Laboratories. Sandia is managed and operated for the National Nuclear Security Administration (NNSA) of the U.S. Department of Energy (DOE) by Sandia Corporation, a subsidiary of the Lockheed Martin Corporation.

Sandia National Laboratories is one of the three NNSA Laboratories with research and development responsibility for nuclear weapons. Sandia's job is the design, development, qualification, and certification of nearly all of the non-nuclear subsystems of nuclear warheads. Our responsibilities include arming, fuzing, and firing systems; safety, security, and use-control systems; engineering support for production and dismantlement of nuclear weapons; field support to the military; and surveillance and support of weapons in stockpile. We perform substantial work in programs closely related to nuclear weapons, including intelligence, nonproliferation, and treaty verification technologies. As a multiprogram national laboratory, Sandia also conducts research and development for DOE's energy and science offices, as well as work for other national security agencies when our special capabilities can make significant contributions.

I will begin my statement by reviewing highlights of Sandia's recent accomplishments in the nuclear weapons program and other national security programs, including Sandia's contributions to homeland security and the war on terrorism. I will then discuss issues of concern to Sandia in fiscal year 2003 and address in detail Sandia's responsibilities in NNSA's stockpile stewardship and nonproliferation missions. Before concluding, I will comment on the NNSA Administrator's governance initiative for improving the NNSA-contractor relationship.

HIGHLIGHTS OF RECENT SANDIA ACCOMPLISHMENTS

The NNSA Laboratories accomplished much during fiscal year 2001. The investment the Nation makes in these unique institutions yields valuable results for national security.

At Sandia National Laboratories, we perform our scientific and engineering work with the mission in mind—never solely for its own sake. Even the fundamental scientific work that we do (and we do a great deal of it) is strategic for our mission needs. Sandia's management philosophy has always stressed the ultimate linkage of research to application.

We sometimes hear the phrase "science-based engineering" to describe our approach, but this term is really a solecism: Engineering is inherently scientific and cannot be practiced with excellence unless it is deeply integrated with its supporting sciences and employs scientific methodology. When someone refers to Sandia as "the Nation's premier engineering laboratory," that statement does not tell the whole story: We are a science and engineering laboratory with a focus on developing technical solutions to the most challenging problems that threaten peace and freedom.

Sandia's unique philosophy of research and development—which derives from its heritage of 50 years under industrial management—yields significant results for its sponsors. I will briefly highlight some of the outstanding achievements from our work portfolio of fiscal year 2001 in the areas of nuclear weapon activities, nuclear nonproliferation, homeland security, and combating terrorism.

Salient Accomplishments in Weapons Activities

Sandia completed work to qualify the B61–11 earth-penetrating bomb as meeting all requirements, resulting in its acceptance as a standard stockpile item. We made alterations to enhance the safety and security of all B61 bombs at field locations. In recognizing the efforts of the B61–11 certification team, the Commander in Chief of Strategic Command cited the weapon's many advantages over the retired B53–1 bomb.

Similarly, we concluded a 3-year testing and evaluation program resulting in acceptance of the Alt. 342 W87 Life Extension Program warhead for the Air Force by the Nuclear Weapons Council as a standard stockpile item.

A significant milestone in directed stockpile work in fiscal year 2001 was our progress in redesigning the integrated arming, fuzing, and firing system (AF&F) for the W76 warhead for the Trident missile. We recently completed the redesign of a Joint Test Assembly for the W76, which will be used to periodically assess the conformance of the de-nuclearized version of the actual war-reserve warhead.

Sandia played a major role on the NNSA's B83 Systems Engineering Group, which completed development of Alt. 355 for the B83 modern strategic bomb. Alt.

355 is a near-term field retrofit kit that incorporates design modifications to certain hardware.

We completed the Warhead Simulator Package for the Type 3E Trainer for the B61–4 bomb. The Warhead Simulator Package simulates the electrical functionality of the real war-reserve weapon. The new trainer allows military personnel to realistically practice lock/unlock and arming/safing operations without exposing a real nuclear weapon to vulnerabilities. The first production unit of the trainer has been delivered.

Sandia has major responsibility in nuclear weapon use-control systems, which are designed to allow arming of the warhead by national command authority only. We completed a 4 year, full-scale, code management system engineering project, which delivers a significant security enhancement to weapon code operations in Europe. The system enables recoding of nuclear weapons in a fully encrypted manner and greatly simplifies use and logistics.

We have also achieved many important advances in the science and engineering campaigns that enable our successes in directed stockpile work, including radiation-hardened microelectronics, above-ground experimental physics, and advanced simulation and computation.

Accomplishments in Nuclear Nonproliferation

Preventing the proliferation of nuclear materials or weapons to dangerous regimes or terror groups has become a matter of great urgency. NNSA's role in nonproliferation is acknowledged in its mission statement: "To strengthen United States security through the military application of nuclear energy and by reducing the global threat from terrorism and weapons of mass destruction." Sandia's recent contributions have strengthened this effort.

As nuclear fuel reprocessing is adopted by more nations, the proliferation risk associated with fissile materials increases. To evaluate the risk, Sandia developed a proliferation analysis methodology for quantifying the proliferation resistance of nuclear power production fuel cycles. The methodology uses the tools of probabilistic risk assessment to identify proliferation pathways for various definitions of proliferators.

NNSA's "Second Line of Defense" (SLD) program for the security of fissile materials provides consultation to customs agencies to combat trafficking of nuclear material across international borders. In 2001 we assisted 26 site surveys performed at Russian airports, seaports, railroad checkpoints, and border crossings to evaluate strategies for minimizing the risk of nuclear proliferation and terrorism. These site surveys included the deployment and acceptance of systems installed at eight Russian Federation State Customs Committee facilities to detect and deter illicit movements of nuclear materials out of Russia. The program has been successful and is growing to include other countries.

Also with Russia, after 4 years of negotiation and collaboration with the All Russian Institute of Experimental Physics (VNIIEF), we kicked off a joint facility-to-facility remote monitoring project in June 2001. The project will evaluate advanced fissile material monitoring and communications technologies in a bilateral verification regime.

Sandia is responsible for satellite-based sensors for detecting nuclear detonations in the atmosphere. We developed a new space-to-ground communication path for monitoring Nuclear Detection System sensors onboard the Department of Defense Global Positioning System (GPS) satellites. The launch of a GPS satellite equipped with the Nuclear Detonation Detection System Analysis Package in January 2001 significantly enhanced the Nation's ability to detect nuclear detonations occurring anywhere in the earth's atmosphere.

Contributions to Homeland Security and the War Against Terrorism

Like most Americans, the people of Sandia National Laboratories responded to the atrocities of September 11, 2001, with newfound resolve on both a personal and professional level. As a result of our own strategic planning and the foresight of many sponsors to invest resources toward emerging threats, Sandia was in a position to immediately address some urgent needs.

For example, by September 15, a small Sandia team had instrumented the K–9 rescue units at the World Trade Center site to allow the dogs to enter spaces inaccessible to humans while transmitting live video and audio to their handlers. This relatively low-tech but timely adaptation was possible because of previous work we had done for the National Institute of Justice on instrumenting K–9 units for SWAT situations.

You may not be aware that a decontamination formulation developed by Sandia chemists was one of the processes used to help eliminate anthrax in the Hart, Dirk-

sen, and Ford buildings on Capitol Hill, and at contaminated sites in New York and in the Postal Service. Sandia developed the non-toxic formulation as a foam and licensed it for industrial production.

Sandia engineers worked around-the-clock to modify the "Steel Eagle," air-dropped, unattended ground sensor for deployment in Afghanistan. Originally designed under sponsorship of the Defense Intelligence Agency in the 1990s to identify mobile missile launchers, we modified the system to detect light trucks and armored vehicles. The sensors can be deployed from F–15E, F–16, and Predator unmanned aircraft.

Speaking of the Predator, this unmanned aerial vehicle has gained recognition for its ability to capture and transmit in real time high-quality radar images of terrain, structures, and moving vehicles through clouds and in day or night conditions. You may perhaps not be aware that the advanced synthetic aperture radar (SAR) capability on the Predator was substantially developed by Sandia National Laboratories. We began working on miniature radars based on synthetic aperture concepts in 1983 in the nuclear weapons program. In 1985 we became involved in a special-access program for the Department of Defense (DOD) to develop a one-foot-resolution, real-time SAR suitable for use in unmanned aircraft. Sandia flew the first real-time, one-foot-resolution, SAR prototype in 1990. Follow-on work sponsored by DOD continued to improve the system, and a partnership with an industrial firm, which shared program costs, transitioned the technology into the field-deployable systems used in Afghanistan.

In addition to our contributions to the military toolbox for counter-terrorism, Sandia has responded to urgent needs in the arena of homeland security. An array of devices invented by explosives experts at Sandia have proved to be effective for safely disarming several types of terrorist bombs. For the past several years, our experts have conducted training for police bomb squads around the country in the techniques for using these devices for safe bomb disablement. The shoe bombs that Richard Reid allegedly tried to detonate onboard a trans-Atlantic flight from Paris to Miami were surgically disabled with an advanced bomb-squad tool originally developed at Sandia. That device, which we licensed to industry, has become the primary tool used by bomb squads nationwide to remotely disable handmade terrorist bombs while preserving them for forensic analysis.

Detecting explosives in vehicles is a major concern at airports, military bases, government facilities, and border crossings. We have developed and successfully tested a prototype vehicle portal that detects minute amounts of common explosives. The system uses a Sandia-patented sample collection and preconcentrator technology that had previously been licensed to industry for use in screening airline passengers for trace amounts of explosives. The Technical Support Working Group and DOE's Office of Safeguards and Security funded this research.

Sandia is a partner with Argonne National Laboratory in the PROTECT program (Program for Response Options and Technology Enhancements for Chemical/Biological Terrorism), jointly funded by DOE and the Department of Justice. PROTECT's goal is to demonstrate systems to protect against chemical attacks in public facilities, such as subways and airports. For more than a year, a Sandia-designed chemical detector test bed has been operating in the Washington, DC Metro. The system can rapidly detect the presence of a chemical agent and transmit readings to an emergency management information system. We successfully completed a demonstration of the PROTECT system at a single station on the Washington Metro. The program has since been funded to accelerate deployment in multiple metro stations. DOE has also been requested to implement a PROTECT system for the Metropolitan Boston Transit Authority.

Another major worry for homeland security is the potential for acts of sabotage against municipal water supplies. In cooperation with the American Water Works Association Research Foundation and the Environmental Protection Agency, Sandia developed a security risk assessment methodology for city water utilities. This tool has been employed to evaluate security and mitigate risks at several large water utilities. We have used similar methodologies to evaluate risks for other critical infrastructures such as nuclear power-generation plants and chemical storage sites.

These and other contributions to homeland security and the war against terror are possible because of early investment in the capabilities that were needed to respond to emerging threats. The outstanding technology base supported by NNSA for its core missions is the primary source of this capability. We also made strategic decisions to invest laboratory-directed research and development funds (LDRD) in the very things that we knew were urgent needs: items to the Afghanistan theater, the decontamination foam, the sensors we have deployed, and special-purpose robotics that we have developed. In addition, requests for Sandia services from Federal agencies other than DOE for work in emerging areas of need have increased. Ap-

proximately 28 percent of our total laboratory operating budget is provided by Federal agencies other than DOE.

BUDGET-RELATED ISSUES OF CONCERN

Sandia National Laboratories is very busy with work for its core mission responsibilities in nuclear weapon stockpile stewardship. We have a substantial workload of life extension programs for stockpiled systems that requires refurbishment or complete re-design of electronic subsystems and other components. In addition, the responsibility for stockpile certification as weapons age is an ongoing challenge that engages our science and engineering campaigns.

Significant changes will be required to weapon systems that are scheduled to remain in the deployed stockpile or responsive force for decades. This workload is not materially affected by the recent Nuclear Posture Review. Life extension activities require substantial resources of people and facilities. In addition, several studies [1] have repeatedly shown that the infrastructure of the nuclear weapons complex has eroded significantly and needs refurbishment. These and other requirements will demand their share of resources from a program that I described last year as "wound too tight."

In an effort to relax this tension, the Defense Programs laboratories worked closely with NNSA during the last several months to create a multiyear plan to prioritize and integrate programmatic needs within a defensible appropriations profile. The funding levels of the multiyear estimates in that plan reflect our consensus estimate of resource requirements under the guidance provided by Presidential directives, DOD requirements, and the recent Nuclear Posture Review. The plan is a significant milestone inasmuch as NNSA has for the first time outlined a multiyear planning basis agreement with the administration. With careful management, we believe that NNSA's major deliverables can be completed within the Future Years National Security Plan schedule and budget profile.

The fiscal year 2003 budget request is generally consistent with NNSA's Future Years National Security Plan, and it should provide adequate resources for Sandia National Laboratories to meet its mission obligations as currently defined. Four issues of concern to Sandia that I would like to bring to your attention are: the Microsystems and Engineering Sciences Application (MESA) Complex; the refurbishment of NNSA's Z Accelerator; a joint Air Force/NNSA initiative in advanced physical security research and development for nuclear weapons; and the problem of cyber security against sophisticated network attacks.

Microsystems and Engineering Sciences Application (MESA) Complex

Sandia's Microsystems and Engineering Sciences Applications (MESA) complex is the cornerstone of our initiative to address the need for microelectronics and integrated microsystems to support a certifiable stockpile for the future.

Microelectronic components are critical to the NNSA Defense Programs mission. Several key components in deployed nuclear weapons will need to be replaced within the decade. In most cases, components cannot be replaced with replicas of the originals because they are technologically obsolete and the supplier base, materials, and design tools to support them no longer exist. Moreover, competent designers would not elect to use decades-old electronic technology, even if it were available. Sandia has little choice but to meet component replacement needs using the latest microsystem technologies.

In addition, Sandia has a requirement to preserve critical competencies in radiation-hardened microelectronics for defense and space hardware. In accordance with the congressional mandate for a national defense electronics partnership,[2] Sandia retains the capability for radiation-hardening technology and sustains a supporting infrastructure for developing and producing radiation-hardened microelectronics. MESA will provide the infrastructure to meet that mandate for future decades.

I am pleased to report that the preliminary engineering design (Title I engineering) of the MESA complex has been completed and that final engineering design (Title II engineering) is well underway. We are working hard to bring this facility into operation on a schedule that would allow it to contribute to the scheduled stock-

[1] Nuclear Weapons Complex Reconfiguration Study; Complex 21; Defense Programs Phase I and II Maintenance Studies; Energy Federal Contractor Organization Group Study; Office of Secretary of Defense Program Analysis and Evaluation Review; Stockpile Stewardship Program 30-Day Review; DOE Inspector General's Defense Programs Production Facilities Assessment; Fiscal Year 2000 Report to Congress, Panel to Assess the Reliability, Safety, and Security of the United States Nuclear Stockpile (Foster Report).

[2] 105th Congress, 1st Session, National Defense Authorization Act For Fiscal Year 1998, Report 105–29 to Accompany S. 924, June 17, 1997.

pile refurbishment programs approved by the Nuclear Weapons Council and supported by the Department of Defense, but it is not yet clear whether that will be possible.

Z Accelerator Refurbishment

NNSA's Z Accelerator at Sandia National Laboratories has proved to be an important and unique asset for the Stockpile Stewardship Program. Still the world's most powerful and energetic source of x-rays,[3] Z supports NNSA campaigns in nuclear weapon primaries and secondaries, dynamic materials, nuclear survivability, and inertial confinement fusion. Moreover, the recent demonstration of short-pulse, high-power[4] lasers and the installation of the Z-Beamlet laser at Sandia has created the opportunity to cost-effectively explore new mission applications, including advanced radiography of laboratory experiments for stockpile stewardship, the fast ignition inertial confinement fusion concept, and the science of materials under extreme conditions.

Pending the completion of the National Ignition Facility, Z will continue for many years to be the most capable U.S. facility for producing the high-energy-density environments required for studying the phenomenology of nuclear explosives. A refurbishment project to replace aging components and increase the capability of Z by over 50 percent was initiated with an appropriation of $10 million in fiscal year 2002. Those incremental funds allowed us to address a backlog of experimental requests in this current operating year.

Physical Security Research and Development

For the past three decades, Sandia National Laboratories has made unique contributions to both the Department of Energy and the Department of Defense for the security of nuclear weapons. Currently, both NNSA and the Air Force have designated Sandia as their weapon security systems engineer.[5] Sandia is assisting the NNSA's Defense Nuclear Security Office in assessing and engineering security systems so that there is consistency in the approach used for security across all NNSA facilities.

Both NNSA and USAF maintain high security for the nuclear weapons, materials, or facilities under their control, and they have steadily improved security during the past two decades. I am confident that the recent allegations that security may be lax at NNSA nuclear weapon facilities are incorrect. However, we must not be satisfied with the status quo. NNSA and DOD are responding to the increased terrorist threat by examining how security systems can be significantly enhanced with new technology. Numerous upgrades at Air Force nuclear weapon sites are under consideration. Unfortunately, those upgrades may be forced to employ older technology that is actually more expensive and offers less capability. Just as new technology has revolutionized war-fighting, so it offers an opportunity for a similar revolution in security systems.

Past investments by DOE in Sandia's security systems research and development program have yielded crucial technology for the protection of DOE and DOD nuclear assets. In recent years, Sandia's extensive security expertise has been widely sought by other Federal agencies and public entities, including, for example, the Secret Service, the Department of Defense, State and Federal prison systems, Dade County in Florida, many public school systems, the National Institute of Justice (in support of local law enforcement), and the 2002 Winter Olympic Games.

A robust program of security research and development can adapt new technological capabilities for security applications. We have proposed a joint Air Force/NNSA research and development program in nuclear weapon security technology, to be established under the leadership of Sandia National Laboratories. Such a program will result in greater protection for our nuclear weapons and, ultimately, reduced security operational costs. We anticipate joint annual funding by the Air Force and NNSA to raise the existing programmatic effort at Sandia to the level required for this initiative.

Cyber Security

During the past several years, Sandia has experienced an increase in the level, intensity, and sophistication of network attacks directed against our computer resources. We have significant concerns about the ability of any cyber security system to withstand the very sophisticated attacks that are emerging. These developments cause us to worry that the sophistication of these threats are growing at a faster

[3] Power: 230 trillion watts. Energy: 1.6 megajoules.

[4] On the order of 1015 (thousand trillion) watts, or "petawatt" (PW).

[5] Through the NNSA Office of Defense Nuclear Security and the USAF Force Protection Command and Control System Program Office, Electronic Systems Center (ESC).

rate than we are able to respond in hardening our systems against intrusions. This remains one of my most critical concerns.

WEAPONS ACTIVITIES

At Sandia, weapons activities include directed stockpile work, campaigns to advance the scientific and engineering capabilities required for weapons qualification and certification, and readiness programs for NNSA's technology base, facilities, and infrastructure.

Impact of the Nuclear Posture Review

The Secretary of Defense released the NPR in January. It was conducted in response to a congressional request to lay out the direction for American nuclear forces for the next 10 years. The full implications of the NPR will not be known until the final configuration and schedule for the Nation's nuclear arsenal is worked out. However, the NPR calls for sustaining a responsive nuclear force and maintaining a robust and responsive nuclear weapons infrastructure for the long term. It is clear that any savings that may result from the NPR will not be realized for many years.

The NPR calls for reducing operationally deployed nuclear weapons to between 1,700 and 2,200 warheads over the next decade. Most warheads that will be removed from the operationally deployed stockpile will be maintained as a "responsive force" in case of a major change in the global security environment. The intent is to maintain the warheads of the responsive force in a condition that would permit them to be redeployed in a matter of weeks or months. Consequently, warheads in the responsive force will require a level of maintenance and surveillance not substantially different from that required for deployed systems. Their limited-life components will need periodic replacement, and their electronic subsystems will have to be upgraded so as not to become obsolete with the passage of time.

Thus, the warheads of the responsive force will require life extension activities similar to what they would receive if they were in the active stockpile. Only one warhead, the W62, is proposed to be retired. The NPR calls for retiring the Peacekeeper (MX) inter-continental ballistic missile, but the relatively modern W87 warhead on that system will be retained as a replacement for the aging W62 on the Minuteman III. The B61 and B83 bombs also will be retained and may require modifications.

The NPR also calls for NNSA to improve its test readiness program for contingent resumption of underground nuclear testing. Adhering to the test moratorium continues to be U.S. policy, but should a need to test arise, the current preparation time of 2 to 3 years is considered unacceptable.

In summary, I do not expect the Nuclear Posture Review to materially impact the workload of Sandia National Laboratories in stockpile stewardship in the next several years.

Directed Stockpile Work

Directed Stockpile Work encompasses all activities that directly support specific weapons in the nuclear stockpile. Those activities include current maintenance and day-to-day care as well as planned refurbishments. This work includes research, development, engineering, and qualification activities in direct support of each weapon type both in the present and future. Directed Stockpile Work maintains a balanced effort of near-term weapon activities and long-term research and development supported by campaigns.

Stockpile Research and Development

Stockpile Research and Development includes the engineering development and exploratory research and development to support near- and long-term requirements of the nuclear weapons stockpile. This activity includes development of new weapon designs when needed and authorized, preproduction design and engineering activities, design and development of weapon modifications, and safety studies and assessments.

Specific focal areas anticipated for the next 2 fiscal years include support for system studies, mutual defense agreements, and U.S./foreign weapon cooperative safety exchanges; development of specified components and subsystems; improved engineering business practices and information systems; modernized flight test assemblies and instrumentation; refurbishment of several enduring stockpile systems; and continued vigilance through exploration of future system concepts.

Engineering Development. The bulk of the engineering development planned in stockpile research and development will support life-extension refurbishments. The objective of the stockpile life extension effort is to improve and extend the safety

and reliability of U.S. nuclear weapons 20 to 30 years by upgrading or replacing components and subsystems rather than entire warheads. Sandia has been identified by NNSA to be the systems integrator for refurbishments.

Two refurbishment programs are in the engineering development phase: the W76/Mark 4 (Trident), with a first production date of fiscal year 2007; and the W80 warhead for Air Force and Navy cruise missiles, with scheduled first production in 2006. We are also engaged in a study of technical feasibility and cost for possible refurbishment of the B61 strategic bomb, with first production in fiscal year 2004. These refurbishments will replace critical components to ensure decades of life extension.

Exploratory Research and Development. Sandia's advanced warhead concepts group participates with similar teams at the other Defense Programs laboratories and NNSA headquarters to assess nuclear weapon modernization options for emerging military requirements under the advanced concepts initiative headed by NNSA. DOD and NNSA jointly review requirements and identify opportunities for further study.

Stockpile Maintenance

Sandia's responsibilities in stockpile maintenance include design and production of certain components for system life extension programs, limited-life component exchange and repairs, as well as other engineering activities that directly support maintenance of nuclear warheads in the stockpile. For each weapon in the inventory, we must understand and resolve defects (called "significant findings"), maintain use-control equipment, and replace hardware consumed by the surveillance function. During calendar year 2001 we completed and closed 18 significant finding investigations. Because the service lives of many nuclear weapons have been extended well beyond their original intent, we are exhausting the supply of surveillance units available for flight testing. More flight test units must be produced, but the instrumentation to measure performance in joint flight tests with DOD must be redesigned using electronics technology available today.

We have finished a complete redesign of the W76 joint flight vehicle and are currently working on redesigns of the W78 and W87 joint flight vehicles. In addition to these complete redesigns, we have added functionality to the B61 joint flight vehicle by developing and incorporating spin sensors. We are now in the process of incorporating this technology in the B83 joint flight vehicle.

Neutron Generator Production

Sandia has the production mission for neutron generators, an essential component of U.S. nuclear warheads. Sandia manages two pieces within its total production mission: (1) neutron generator production, including both the recertification of neutron generators from the field that have remaining service life and the new neutron generator build; and (2) the Concurrent Design and Engineering (CDM) production assignment. As neutron generator production ramps up and the CDM program grows to support the W76 and W80 life extension programs, production operating funds will require an increase over fiscal year 2002 of approximately $45 million by fiscal year 2005. Estimates are still being generated as the refurbishment programs continue to define the CDM components they will need.

Stockpile Evaluation

Stockpile evaluation includes laboratory tests, flight tests, quality evaluations, special testing, and surveillance of weapon systems to assess the safety and reliability of the nuclear weapon stockpile as a basis for the annual certification to the President.

Surveillance testing frequently results in recommendations for repairs and upgrades to the stockpile. Last year, following Sandia procedures, DOD replaced limited-life components in several weapon systems to add what we believe will be significant periods of maintenance-free service while the weapons are in DOD custody.

I am happy to report that we have completed Title 1 (design) of the new Weapons Test Evaluation Laboratory construction project that Congress funded as a line item 2 years ago. This state-of-the-art facility will replace our 40-year-old building at the NNSA weapons facility near Amarillo, Texas. Completion is scheduled for Fall 2004. We are developing advanced diagnostic tools to update existing test equipment, and we hope to incorporate other enhancements from the Enhanced Surveillance Program. Our goal is to move the surveillance program toward a predictive capability that will allow us to replace components in our aging stockpile before they affect reliability.

DOD and DOE annually conduct joint flight tests on weapons of each weapon type in the enduring stockpile. Historically, flight tests have uncovered about 22 percent of the defects in surveillance databases. After a hiatus in Air Force cruise missile

testing due to missile problems and infrastructure renewal, I am happy to report that we have begun flight testing again with two successful air-launched cruise missile tests, although it will take us several years to catch up with our desired level of testing. As we work with the Air Force on flight testing for existing warheads and determine their future needs for an upgraded system, we are desperately short of Air Force test hardware for the air-launched cruise missile. We face a near-term problem of having limited opportunities for both flight testing of existing systems as well as proving the interfaces necessary to field our proposed life extension program for the W80 warhead.

To help compensate for shortfalls in flight tests and a dramatic reduction in the number and variety of reentry vehicles that can be flown if the W87 is deployed on Minuteman III, on-board instruments must be improved to provide additional performance information in fewer tests. This past year, we successfully flight-tested an enhanced-fidelity instrumentation package in the W87 reentry vehicle.

The Tonopah Test Range, which Sandia operates under agreement with the Air Force, is absolutely irreplaceable as a flight-test site for air-delivered bomb systems. Without it, we could not continue to assess and certify systems nor perform research and development on new delivery systems. I urge continued congressional support for joint use of the Tonopah Test Range and the proper level of funding support for range infrastructure to ensure its viability.

I would like to address the two reports issued by the DOE Inspector General this past year on the surveillance program—one on the testing backlog for flight and laboratory tests, and the other on the significant findings investigation process. While I do not believe that the situation is as dire as the headlines might have suggested, there was action necessary on the part of NNSA and the laboratories to improve performance. I assure you that we at Sandia are taking this matter very seriously. We are working with the Navy and Air Force to ensure the availability of samples and flight-test vehicles to eliminate the identified backlogs. As you might expect, as a result of the tragedy of last September and the focus on prosecuting the war, this may take longer than any of us might desire, but I can assure you that we have everyone's complete cooperation. The laboratories fully support the actions being directed by NNSA in response to the IG's reports, and I believe that future reviews in this area will show improvement.

The surveillance program is the foundation for maintaining the aging stockpile. We believe that the surveillance program should maintain an adequate number of flight tests each year using military personnel, procedures, and hardware. Therefore, I urge you to assure an appropriate level of support for the joint surveillance flight test program, for both NNSA and the DOD, to sustain confidence in the reliability of our strategic nuclear deterrent.

Campaigns

Campaigns are multifunctional efforts across the NNSA Defense Programs laboratories, the production plants, and the Nevada Test Site that, in aggregate, constitute an integrated weapons science and technology program for developing critical capabilities for weapons qualification and certification. The goal of the NNSA Defense Programs campaigns is to address current or future capability needs by employing the best scientists and engineers and using the most current scientific knowledge and technologies. Many of the campaigns are interrelated and establish a foundation for future deliverables in directed stockpile work. Without a robust campaign program, our ability to support stockpile stewardship would be seriously harmed.

Engineering Campaigns

NNSA's engineering campaigns strengthen the science and engineering competencies that directly support mission responsibilities in enhanced surety (comprising safety, use-control, and reliability), annual weapons system certification, nuclear survivability for nuclear weapons and other military systems, enhanced surveillance of the nuclear weapons stockpile, and advanced design and production technologies to support system life-extension programs.

Enhanced Surety. This campaign provides the most modern surety possible for nuclear weapons during replacement, refurbishment, and upgrades of weapon components. Specifically, this campaign is developing surety options and technologies for the B61, W76, and W80 weapon life-extension programs. It is also developing new surety assessment methodologies and supporting the integration of microsystem components into surety components, subsystems, and architectures.

Weapon System Engineering Certification. This campaign develops validated computational models and a suite of tools to support certification of the B61, W76, and W80 life extension programs.

Nuclear Survivability. Nuclear weapons must be able to survive and function in severe environments. Radiation produces thermal and mechanical stresses that may impact the reliability of weapon components. Although large fluxes of radiation would result from hostile attacks, disruptive levels of radiation are also present in natural environments, such as space. Also, periodic weapon diagnostics and exposure to radioactive decay from the nuclear explosive package can produce lower radiation levels of longer duration. Radiation can deform, spall, or degrade materials; change the conductivity of electronic components; generate and transmit shocks in materials; and release trapped gases. Microelectronic components are especially vulnerable to these effects.

This campaign develops microelectronic technologies and certification tools to ensure that refurbished stockpile weapon components satisfy their radiation survivability requirements as defined in each weapon's stockpile-to-target sequence. These capabilities are being developed for immediate application to the W76 life extension program, which is critically dependent on their timely development and validation.

Sandia operates a number of test facilities that provide intense x-ray, gamma-ray, neutron, electron, and mechanical environments to support the qualification of weapon systems and components and to validate simulation codes.

Our goals for the next several years include demonstrating the maturity of next-generation, radiation-hardened microelectronics by designing and fabricating test devices and circuits and characterizing their performance in radiation environments. We will also conduct experiments to validate mechanical response models, mature our understanding of radiation-induced damage mechanisms in semiconductor materials, improve our diagnostic capabilities to support material characterizations, and investigate radiation hardening phenomena in microelectromechanical systems.

Enhanced Surveillance. The Enhanced Surveillance campaign develops tools, techniques, and models to measure, qualify, calculate, and predict the effects of aging on weapon materials and components and to understand how those effects impact weapon safety and reliability.

One enhanced surveillance project uncovered unexpected behavior in desiccants designed to maintain a non-corrosive internal weapon atmosphere. Our new understanding of desiccant behavior is guiding the formulation of new desiccants for weapons refurbished under stockpile life extension programs. Another project discovered problems with newly procured material for replacement o-rings. The problems with the incoming material were assessed, and a negative impact on the stockpile was averted.

In the future, enhanced surveillance techniques will strengthen the credibility of the deterrent by warning of manufacturing and aging defects in time to schedule weapon refurbishments before performance is impaired.

Advanced Design and Production Technologies. The Advanced Design and Production Technologies (ADAPT) campaign provides technology maturation and integration of modern product realization tools and methods across NNSA's product realization enterprise, including laboratories and plants.

Science Campaigns

NNSA's science campaigns advance our understanding of the physical principles of nuclear explosive systems and support weapons system certification activities.

Dynamic Materials Properties. The Dynamic Materials Properties campaign develops physics-based, experimentally validated data and models of all stockpile materials under a broad range of dynamic conditions found in nuclear explosions.

Primary Certification. The Primary Certification campaign includes experimental activities to develop the capability to certify rebuilt and aged primaries to within a stated yield without nuclear testing. Sandia's efforts in this area focus on the development and implementation of advanced compact flash radiographic sources for use on subcritical experiments.

Secondary Certification and Nuclear Systems Margins. The Secondary Certification and Nuclear Systems Margins campaign includes experimental and computational activities that will determine the minimum essential factors for producing an effective weapon.

Sandia's contribution is to support the development of computational models to predict the performance of nominal, aged, and rebuilt secondaries and perform collaborative experiments with the other NNSA laboratories in radiation case dynamics, radiation flow, and secondary performance.

Advanced Simulation and Computing Campaign

To achieve simulations with sufficient complexity and fidelity to support stockpile stewardship, NNSA must increase computational capability and capacity tremendously. The Advanced Simulation and Computing (ASC) campaign will hasten ad-

vances in computational science to enable the shift from test-based methods to computation-based methods.

ASC activities at Sandia consist of code development for stockpile applications; problem solving environments; maintenance of sufficient on-site computational, networking, and communication capabilities; and partnering alliances with university and industry researchers. We are working on new mathematical methods, algorithms, and software for solving large-scale problems on massively parallel, often distributed systems. Areas of importance include mechanical and thermal response of weapons, shock physics, chemically reacting flows, electromagnetics, and the computational analysis and design of materials. As these techniques are developed, they are incorporated into codes relevant to stockpile applications. ASC simulation tools are being used to support design and certification activities for the W80 and W76 life extension programs.

Inertial Confinement Fusion Ignition and High Yield Campaign

This campaign includes activities to support ignition implosions on the National Ignition Facility and to enhance experimental capabilities for stockpile stewardship on Sandia's pulsed power facilities. A fusion yield of 200 to 1,000 megajoules in the laboratory is a long-term goal. We are providing intense x-ray sources for weapon physics and weapon effects testing, evaluating high-yield inertial confinement fusion concepts in the laboratory using z-pinches, and developing sophisticated diagnostics for the National Ignition Facility and Z Accelerator to support stockpile stewardship.

Readiness in Technical Base and Facilities (RTBF)

Readiness in Technical Base and Facilities provides physical infrastructure and operational readiness at the laboratories, the Nevada Test Site, production sites, and other NNSA sites where the scientific, technical, and manufacturing activities for stockpile stewardship are conducted.

Operation of Facilities

Operation of facilities includes NNSA Defense Programs' share of the costs to operate and maintain programmatic facilities in a state of readiness at which each facility is prepared to execute programmatic tasks identified under directed stockpile work and the campaigns. These costs include the structures, equipment, materials, procedures, and personnel necessary to provide program sponsors with a facility that is safe, secure, reliable, and ready for operations.

Sandia has a large number of facilities supported by the Readiness in Technical Base and Facilities subcategory:

- The Microelectronics Development Laboratory maintains radiation-hardened integrated circuit technologies.
- The Compound Semiconductor Research Laboratory generates new technology options in semiconductor materials, processes, and device technologies to support directed stockpile work.
- The Tonopah Test Range in western Nevada provides Sandia with essential flight test capabilities (including those for joint test assemblies) as part of the stockpile surveillance effort.
- The Albuquerque Full-Scale Experimental Complex comprises Sandia's Technical Area III experimental facilities. The facilities and most of the test equipment they house range from 30 to 50 years old. An RTBF construction project, Test Capabilities Revitalization, is planned to renovate and refurbish the complex.
- Sandia's Z Accelerator is the world's most powerful laboratory x-ray source. It supports directed stockpile work and NNSA campaigns in dynamic materials properties, secondary certification and nuclear systems margins, inertial confinement fusion ignition and high yield, and nuclear survivability.
- NNSA's Neutron Generator Production Facility at Sandia manufactures neutron generators, a limited-life component required in U.S. nuclear warheads.

Program Readiness

Program Readiness includes activities that support more than one directed stockpile work activity, campaign, or facility and that are essential to achieving mission objectives. Sandia has numerous projects and programs covered by this budget subcategory. They include the following:

- The Defense Nuclear Materials Stewardship project develops materials management systems to enhance the safety, security, and accountability of

nuclear weapons, nuclear materials, and weapon components during storage, handling, and transportation.

• The Knowledge Management Program develops workforce stewardship strategies to recruit and retain staff with essential skills, enhance career development, and improve access to retirees and other resources of knowledge for active weapon professionals.

• The Microsystems Infrastructure Readiness Project maintains Sandia's microsystems capabilities, with a secondary role of developing capabilities to support fabrication of war-reserve microsystem components.

• The Pulsed Power Technology Project maintains our capability for designing a wide variety of pulsed power drivers, ranging from high-impedance accelerators for gamma rays and radiography to high-power drivers for z-pinches.

Construction

Sandia's construction plan is designed both to provide the facilities we need to support programmatic objectives and to eliminate excess and substandard space.

Sandia's Microsystems and Engineering Sciences Application (MESA) complex, discussed earlier, is the top priority in our construction plan. Other vital line-item construction projects include the following:

• The Weapons Evaluation Testing Laboratory at NNSA's Pantex Plant will provide a state-of-the-art facility for testing weapon components and implementing advanced diagnostic techniques developed by the enhanced surveillance campaign.

• Funded as construction under the Advanced Simulation and Computing campaign, two key facilities supporting the ASCI program are under construction at Sandia laboratory locations: The Distributed Information Systems Laboratory (DISL) at Sandia's site in California will develop distributed information systems for enabling collaborative computational work across the nuclear weapons complex. The Joint Computational Engineering Laboratory (JCEL) at Sandia's site in New Mexico will support multi-physics code development on massively parallel computers.

• The Model Validation and System Certification Test Center will provide testing facilities to continue providing data for weapons certification; enhance capabilities to facilitate large-volume data delivery; and replace an aging communications infrastructure with integrated command and control, data collection, processing, and distribution systems.

• The Test Capabilities Revitalization project will modernize Sandia's nonnuclear field testing and experimental infrastructure and our diagnostic capabilities to perform weapons qualification, development, surveillance, and model validation. The project will renovate existing facilities and provide new facilities, subject to cost-benefit studies.

General Plant Projects

General Plant Projects Program funding is essential for managing our facilities and conducting safe and reliable facility operations.

This change has given laboratory management some flexibility in determining the amount of general plant project and capital equipment funding needed to maintain infrastructures and to respond to changes in infrastructure maintenance requirements. The funding limit for general plant projects is $5 million per project. The new flexibility we have to determine the best use of general plant funds has enabled us to improve administrative and support facilities that have been neglected far too long.

Sandia received DOE approval in fiscal year 2001 to fund and construct an Institutional General Plant Project (IGPP) building. IGPPs are construction projects for general-purpose institutional space funded through indirect cost recovery rather than by direct funding from a programmatic sponsor. Sandia was the first DOE contractor to pilot this alternative that is now permitted by new regulations. We are seeking approval to construct two additional buildings through the IGPP mechanism in fiscal year 2002.

DEFENSE NUCLEAR NONPROLIFERATION

Sandia's support for the NNSA Office of Defense Nuclear Nonproliferation (NN) includes research and development on systems for detecting proliferation of weapons of mass destruction, verifying international arms agreements, enhancing the protection of nuclear material and weapons in Russia, eliminating surplus inventories of fissile materials in Russia, protecting against chemical and biological incidents, and providing mechanisms to enhance regional stability.

I am pleased that the fiscal year 2002 budget reversed a downward trend in NNSA's programs for nonproliferation and verification research and development. This important investment yields leading-edge prototypes and demonstrations that serve our national security interests exceptionally well.

The greatest successes coming from this program are the result of persistence in providing support over long periods to allow for the full development and demonstration of applied technologies. We appreciate your trust in the laboratories to take technical risks that have yielded innovative solutions for monitoring treaties, protecting nuclear materials, and protecting against threats of chemical and biological terrorism. I urge your continued strong support for this important research and development program.

Nonproliferation and Verification Research and Development

Sandia is developing a new generation of satellite-based sensors to detect low-yield nuclear explosions in the atmosphere. We also are developing a seismic data processing system to enhance detection of underground nuclear explosions. Our activities are part of a multilaboratory effort to develop affordable, deployable, and flexible sensors for seismic, hydro-acoustic, radionuclide, and infrasound data acquisition and processing. These activities are coordinated and, in many cases, co-funded by the Department of Defense, which has the operational nuclear-test monitoring responsibility for the U.S. government.

We are developing airborne and satellite-based systems for detecting and characterizing proliferation-related activities involving chemical weapons, biological weapons, and missiles. Sandia coordinated the integration of NNSA's Multispectral Thermal Imager Satellite research project, which has recently completed its second year of successful operation and research. We are also developing a laser-based system for remote detection and identification of chemical and biological species in effluent plumes. We will conduct flight tests this year of the integrated system on an unmanned aerial vehicle. We have made impressive progress toward developing specialized chemical and biological microsensors, bioinformation systems, and decontamination technologies for nuclear, biological, and chemical weapons and for detecting nuclear material smuggling. With regard to the microsensors, we are currently conducting field trials, and preliminary results are very promising.

Nonproliferation and Arms Reduction Transparency

NNSA's Cooperative Monitoring Center (CMC) at Sandia National Laboratories assists a number of countries and agencies in evaluating the applicability of arms control technologies and protocols for regional security issues. Export-approved monitoring equipment is available for representatives of regional parties from areas such as south Asia, the Middle East, the Balkans, and the Korean peninsula, to evaluate for application to specific regional problems. For example, the CMC is currently engaging Pakistan and India in a cooperative boundary monitoring project. The CMC also supports technical analysis of policy options for DOE and provides national security insight to other organizations. CMC staff also provide technical consultation to U.S. negotiating delegations.

In an effort to extend the accessibility of the CMC to an affected region, a similar institute is being established in Amman, Jordan. This development is a cooperative effort of the Department of State, the Defense Threat Reduction Agency, and NNSA. It is a significant cooperative development involving the United States and Jordan and represents an opportunity to foster stability in that region through the integration of technology and policy.

In other activities, Sandia assists with the evaluation of export licenses for technology with possible uses for weaponization activities. We also help develop technology for International Atomic Energy Agency remote monitoring and inspections. Sandia develops remotely accessed, unattended cooperative monitoring systems for applications in foreign states without nuclear weapons that are party to the Treaty on the Non-Proliferation of Nuclear Weapons. These activities typically support the International Atomic Energy Agency and bilateral safeguards agreements between the United States and foreign states with nuclear materials of U.S. origin. Other work is conducted for the physical protection of nuclear materials in the Baltic and independent states of the former Soviet Union and in states that are party to the Convention on the Physical Protection of Nuclear Material. These activities include the International Atomic Energy Agency International Physical Protection Advisory Service, training classes, and physical security upgrades.

U.S./Russian Nuclear Security Programs

Sandia supports a broad range of cooperative programs with Russia in nuclear security. These programs, funded by NNSA, DOD's Cooperative Threat Reduction program, and the Department of State, address the safety and security of nuclear

weapons, the security of fissile materials, verification of fissile materials, and defense conversion.

I want to make special note of the importance of the activities with Russia. The terrorist attacks last September have made us all acutely aware of the catastrophic potential of weapons of mass destruction should they end up in the wrong hands. The cooperative efforts to protect nuclear materials and maintain state control over nuclear capabilities and assets in Russia are important initiatives that must continue. We promote a vision called "Global Nuclear Management" that, if realized, would assure the control of all nuclear materials in the world. However, the current state of protection for nuclear materials in Russia, while improved through the past efforts of this program, is an important indication of the potential for nuclear material proliferation. We must continue these efforts with Russia.

Russian Transition Initiatives

In support of defense conversion programs, Sandia has been an active participant in the Russian transition programs, including the International Proliferation Prevention Program, which engages weapons scientists, engineers, and technicians from the former Soviet Union in nonmilitary projects. This program provides seed money for nonmilitary research and provides links with U.S. industry to commercialize the new activities. In a particularly effective case, Sandia engineers worked with Spektr Conversion LLC, a company formed by scientists at the Russian nuclear weapons laboratory, the All-Russian Scientific Research Institute of Technical Physics (VNIITF), and a U.S. manufacturer, Numotech Inc., to design and build a wheelchair seat cushion to prevent pressure sores. The prototype cushion was clinically tested at a VA hospital and is approved by the FDA. The program provided employment opportunities in an area of civilian need for Russian technical personnel.

International Nuclear Materials Protection and Cooperation

A major Sandia program that addresses the security of nuclear weapons and fissile material in Russia is the Materials Protection, Control, and Accounting (MPC&A) program. Since 1993, Sandia has participated in this multi-laboratory effort to reduce the threat of diversion of Russia's nuclear weapons and weapon-usable nuclear material to rogue states or terrorist groups. This program, which originally included projects in Russia and a number of the newly independent states, now focuses on Russia in the areas of nuclear material and nuclear facilities operated by the Ministry of Atomic Energy, the Russian Ministry of Defense, and smaller independent ministries. Activities include vulnerability assessments, protection system design, training, and support for hardware installations and maintenance. Assistance is also provided to states other than Russia to protect fissile materials, on-site and in transit, against theft. Protecting U.S.-origin nuclear material in other countries is a particular concern. A related activity provides assistance to the International Atomic Energy Agency (IAEA) to develop physical protection guidelines.

GOVERNANCE REFORM

A very important initiative by the NNSA Administrator is an effort to redesign the NNSA contractor relationship through a new approach to governance. The goal is to implement a simpler, less adversarial contracting model capitalizing on the private-sector expertise of the management and operating contractors while increasing contractor accountability for performance and responsiveness to NNSA requirements.

The current governance structure for the NNSA Laboratories is broken. I doubt that any of my lab director colleagues would disagree that the current governance regime unreasonably constrains us from exercising prudent management authority and bold leadership in accordance with best industrial practices; and yet, that kind of leadership was precisely what the Federal Government bargained for under the original GOCO (government-owned, contractor-operated) contracting model. The influential Galvin Report[6] was perhaps the most adamant of several studies that have been critical of the excessively bureaucratic nature of DOE governance of the laboratories. The Galvin Task Force found that the GOCO model has been so encumbered with bureaucratic accretions that it would be better to scrap it altogether and privatize the laboratories. While that is probably too drastic a remedy, we should all be concerned that the current laboratory governance regime fails to encourage man-

[6] *Alternative Futures for the Department of Energy National Laboratories,* Secretary of Energy Advisory Board, Task Force on Alternative Futures for the Department of Energy National Laboratories. Robert Galvin, Chairman, et al., February 1995.

agement initiative for superior performance beyond mere compliance with an array of bureaucratic prescriptions.

As originally conceived, the GOCO model was a strategic partnership between a Federal agency and a premier industrial or academic entity. In simple terms, the key operating concept was that the Federal sponsor articulated WHAT was to be achieved (the mission and its programmatic deliverables) while the contractor determined HOW to achieve it, in accordance with best industrial practices. The laboratory governance reform initiative that the NNSA Administrator proposes includes an assurance strategy that will employ several private-sector assurance systems such as comprehensive internal auditing, oversight by boards and external panels, third-party certifications, and direct engagement between oversight bodies and NNSA's leadership.

The first phase of this initiative will attempt to reduce contractual prescriptions that exceed those mandated by law and regulation. The second phase will design and demonstrate a new governance model, conducted as a pilot program at Sandia National Laboratories. If the subsequent appraisal of the pilot phase is positive, the new model would likely be implemented at other NNSA Laboratories and plants.

CONCLUDING REMARKS

In my view, the National Nuclear Security Administration, under the businesslike leadership of General John Gordon, has made significant progress during the past year in its organizational effectiveness. The agency is now functioning with evident coordination and teamwork, attributes which will likely be strengthened even more as the administrator's organizational and operational plans are implemented. To assure continued success, however, the agency needs long-term support from Congress and sustained resources to meet the formidable requirements of stockpile stewardship in the years ahead.

On behalf of the dedicated and talented people who constitute Sandia National Laboratories, I want to emphasize our commitment to the NNSA mission to strengthen United States security through the military application of nuclear energy and by reducing the global threat from terrorism and weapons of mass destruction. It is our highest goal to be a national laboratory that delivers technology solutions to the most challenging problems that threaten peace and freedom.

PREPARED STATEMENT BY C. BRUCE TARTER

OPENING REMARKS

Mr. Chairman and members of the subcommittee, thank you for the opportunity to provide a statement on the budget request for fiscal year 2003 for the National Nuclear Security Administration (NNSA). I am the Director of the Lawrence Livermore National Laboratory (LLNL). Livermore is committed to maintaining confidence in the U.S. nuclear weapons stockpile as a principal participant in the Nation's Stockpile Stewardship Program. The laboratory is also engaged in vital national programs to reduce the threat posed by the proliferation of weapons of mass destruction and to provide for homeland security.

My statement discusses Livermore's accomplishments in NNSA programs as well as the technical and programmatic challenges we face. But first, I want to thank Congress for your continuing support of the Stockpile Stewardship Program and our nonproliferation and threat reduction activities. The Stockpile Stewardship Program continues to make excellent technical progress in the face of many challenges, some of the toughest of which likely lie ahead as weapons continue to age. A strongly supported and sustained Stockpile Stewardship Program is clearly needed to ensure that this Nation can maintain the safety, security, and reliability of its nuclear deterrent over the long term. The 5-year plan of the National Nuclear Security Administration details the need for a strong program, and I support NNSA's plan and the budget request for fiscal year 2003.

Strong and sustained support is likewise needed for programs aimed at providing technologies to reduce the threat posed by weapons of mass destruction (WMD) through nonproliferation, counterproliferation, and counterterrorism activities. Because Livermore and our sister NNSA Laboratories had been working for the past decade to develop technical capabilities to detect, counter, and mitigate WMD proliferation and terrorism, we were able to respond rapidly and effectively to the events of September 11 and its aftermath. Although those investments are paying great dividends in the newly declared war on terrorism, substantial investment is needed to develop vastly improved warning and responsive capabilities to protect

the U.S. against these threats, now and in the future. We are fully committed to this long-term national security endeavor.

INTRODUCTION

Exactly 1 year ago, NNSA Administrator General John Gordon, head of the NNSA, and Admiral Richard Mies, Commander in Chief of U.S. Strategic Command, were at Livermore to commemorate the certification of the refurbished W87 ICBM warhead. Speaking as the "customer," Admiral Mies called the occasion an "historic event" and "the first real test of stockpile stewardship." The W87 life-extension program challenged all elements of the Stockpile Stewardship Program. Devising the engineering improvements to the warhead, going into production in a less than fully functional weapons complex, and certifying the performance of the refurbished warheads without nuclear testing were all major accomplishments. It is an important success story, but in the words of General Gordon, "we still have a long way to go." More challenging technical issues are on the horizon as the weapons continue to age, as other weapon systems are refurbished, and as new needs emerge.

Weapon-refurbishment decisions and actions bring into play the full spectrum of capabilities that we are striving to attain through the Stockpile Stewardship Program. First, to recognize and evaluate aging problems (and other defects) in weapons and devise remedies, we must understand in detail the science and technology that govern all aspects of nuclear weapons. We are making progress here, but we need even better investigative tools. Second, the nuclear weapons production complex must be able to remanufacture parts and refurbish weapons as needed. Currently the complex is far from fully functional. Third, we must be able to certify with confidence the performance of both the refurbished warheads and the other weapons in the stockpile. This task requires the application of expert judgment, together with the advanced experimental and computational tools we are using to improve our fundamental understanding of nuclear weapons. Finally, acquisition of this spectrum of capabilities is time urgent to meet existing requirements for weapon refurbishment and to deal with other weapon performance issues as they arise.

Thus a principal goal of the Stockpile Stewardship Program has been to expeditiously put into place a set of vastly improved scientific tools and modern manufacturing capabilities, including 100-TeraOps supercomputers, advanced radiography capabilities to take three-dimensional images of imploding mock primaries, a high-energy-density research facility (the National Ignition Facility) to study the thermonuclear physics of primaries and secondaries, and efficient and flexible manufacturing facilities. These investments are very demanding of resources, as is the need to meet requirements imposed by the Department of Defense (DOD). The 2002 Nuclear Posture Review provides a high-level policy perspective of what will be demanded from the NNSA Laboratories to sustain the Nation's nuclear posture. Concurrently, NNSA has developed a 5 year plan for its Defense Program activities. The proposed budget for fiscal year 2003 and succeeding years is larger than recent budgets, but there is much to be done and we must manage to achieve our critical milestones with the resources provided.

Livermore has major responsibilities within the Stockpile Stewardship Program, and our successes in 2001—as well as the challenges that lie ahead—provide a snapshot of the overall program. I already mentioned the successful certification of the W87 warhead, refurbished through a life-extension program (LEP). In addition, Lawrence Livermore and Sandia/California are starting the LEP for the W80 cruise missile warhead, designed by Los Alamos. This program will implement refurbishment options defined in a formal DOD/DOE study completed in 2000. It builds upon a modern baseline understanding of the W80 and its performance, which was developed cooperatively by the New Mexico and California laboratories during the DOD/DOE study and through significant additional work performed during 2001. At this time, there is a congressional hold on NNSA work for the LEP while the Air Force defines its plans for life-extension work on the cruise missiles themselves. Prompt agreement on the path forward is needed if we are to be able to meet the directed date for the W80 first production unit (FY 2006). Also in fiscal year 2001, we completed a pilot project to demonstrate the capability to conduct warhead pit surveillance operations, and we are now performing full surveillance on two warhead pits. Transfer of certain pit surveillance responsibility for LLNL-designed warheads to Livermore makes the work load at the TA–55 facility at Los Alamos more manageable.

Lawrence Livermore is also responsible for a number of state-of-the-art experimental and computer facilities—in operation and in development—that are essential for stockpile stewardship. Construction of the Contained Firing Facility for hydro-

dynamic testing at Site 300 is now finished. Qualification testing has been completed to assure the facility's ability to contain debris from experiments that use up to 60 kilograms of high explosives. The first stockpile-related experiment was executed last month, and an active testing schedule is now under way.

Construction of the National Ignition Facility (NIF) at Livermore is now more than 60 percent complete. I am extremely pleased to report that NIF remains on track and is meeting its baseline cost and schedule as provided to Congress in September 2000. We expect to have NIF's first laser beams delivered to the target chamber within the next year. Over the past 2 years, regular reviews of the NIF Project have been held every 6 months. Among other positive findings, the most recent review concluded that "The project has made impressive progress and has been responsive to previous review team recommendations." NIF remains a funding-constrained project that could be completed earlier and at significantly less total cost if more of its total project funding were to be made available in fiscal year 2003 and fiscal year 2004 rather than in later years.

The Advanced Simulation and Computing (ASCI) program is central to many of the success stories of the Stockpile Stewardship Program. Last summer, we took delivery from IBM of ASCI White, the world's most powerful computer, capable of 12.3 TeraOps (trillion operations per second). This machine has been used intensively by all three weapons laboratories to support stockpile stewardship through a variety of applications. For example, in the fall of 2001 both Livermore and Los Alamos used this machine to complete the first-ever fully three-dimensional simulations of a complete warhead explosion. We are earmarked to take delivery of our next ASCI computer in fiscal year 2004, a machine that will be capable of 60 to 100 TeraOps. The groundbreaking ceremony for construction of the Terascale Simulation Facility (TSF) to house this computer was held just last week.

The events of September 11 highlighted the immense value of the NNSA Laboratories' technical capabilities and their activities to reduce the threats posed by the proliferation or terrorist acquisition of weapons of mass destruction. These efforts are part of a comprehensive set of activities aimed at proliferation prevention (e.g., through cooperative programs with Russia), detection and reversal, response, and avoiding surprise (including support to the U.S. Intelligence Community).

Post-September 11, Lawrence Livermore provided analysis and assessments as well as information-operations tools and expert personnel to the Intelligence Community. Our Nuclear Threat Assessment Center operated 7 days a week to evaluate numerous smuggling incidents and nuclear-related threats. Miniaturized DNA analysis technology pioneered by Livermore made possible several biodetectors with vastly improved capabilities which are being commercialized and are at the core of the Nation's biodefense capabilities. In addition, our Counterproliferation Analysis and Planning System (CAPS), extensively used by the DOD, supported U.S. military efforts with evaluations focused on sites of concern in and around Afghanistan. Later in my statement, I provide many other examples of the capabilities and expert assistance we are providing to help government entities defend against WMD terrorism.

In short, Livermore's assessment capabilities and technologies are contributing to homeland defense in manifold ways. We were able to respond immediately because we had begun to address the threat of WMD terrorism long before September 11. We take a comprehensive approach to the problem, developing technologies and tools to counter threats and working closely with Federal, state, and local response agencies to ensure that our technological solutions meet real-world operational needs. In several key areas, the research programs benefited greatly from the use of Laboratory-Directed Research and Development (LDRD) funding for exploratory efforts that led to technologies that are now being deployed; for example, without the head start provided by LDRD, the advanced biodetection systems that are now being fielded would still be in development. We are poised to contribute to homeland defense in the long-run through the development of more advanced technologies to defend against both current and future threats. The nation would greatly benefit from sustained funding for long-range research and development activities at the NNSA Laboratories to improve homeland security.

One area of concern is the proposed fiscal year 2003 budget for Environmental Management efforts at the Laboratory, which constitutes a reduction of about 27 percent from the fiscal year 2002 allocation of $40.9 million. The Laboratory requires an additional $17.5 million above the budget request to maintain its existing Environmental Management program, which consists of two parts. The first is Environmental Restoration—the clean up of groundwater and soil contaminated from past operations. Considerable work has been done in remediating contamination at the laboratory's two sites. However, with the proposed cuts, Livermore will miss critical cleanup milestones that have been negotiated by DOE with the State of Cali-

fornia and the U.S. Environmental Protection Agency. In contrast, the laboratory strongly believes that we should accelerate our cleanup activities, and we are again proposing this initiative to DOE as we have in past years. The second part of the program, Waste Management, involves the treatment, handling, and disposal of hazardous and radioactive waste from ongoing and past operations. Under the current proposed budget, it will be impossible to support the laboratory's programmatic needs with a safe, compliant waste management program. This will have severe impacts on the national security mission and will cause certain programmatic activities to be deferred and/or cancelled.

On a positive note, from Livermore's perspective, I am very pleased with the progress that General Gordon is making at NNSA and with changes at the University of California in its role as manager of the Livermore and Los Alamos national laboratories. Preparation of the 5 year plan for NNSA's Defense Program activities is the first of what I expect to be many tangible benefits from NNSA organizational changes. General Gordon's plan to eliminate a layer of field management and to reengineer operations at NNSA sites are other important steps. We at Livermore are working with NNSA to find ways to significantly reduce the administrative workload. As part of the University of California's management and operations contract extension, the position of Vice President for Laboratory Management was created and John McTague was selected to serve. Dr. McTague is providing outstanding leadership in efforts to strengthen management accountability, institute more uniform best practices in operations at Lawrence Livermore and Los Alamos, and foster even greater cooperation between the laboratories.

As you may be aware, I will be leaving my position as laboratory director soon, when my successor has been selected. I appreciate the support that this committee has provided to Lawrence Livermore and to me during my tenure. I also appreciate having had the opportunity to serve our Nation in this manner. I look forward to the very positive future that I believe Lawrence Livermore will have with your continued support.

THE STOCKPILE STEWARDSHIP PROGRAM

The Stockpile Stewardship Program is designed to ensure the safety and reliability of the U.S. nuclear weapons stockpile required to meet national security needs of the 21st century. Confidence in the safety and reliability of the weapons is to be maintained through an ongoing and integrated process of stockpile surveillance, assessment and certification, and refurbishment. Stockpile stewardship is a principal mission of the NNSA. NNSA began operation in March 2000.

Earlier this year General John Gordon, Administrator of NNSA, announced organizational changes to enhance NNSA's performance in core mission areas. The changes realign and separate programmatic and operational functions within the agency. The organizational and other positive changes adopted by General Gordon will clarify lines of communication and authority, which should improve overall efficiency and performance. Execution of the Stockpile Stewardship Program remains the primary responsibility of the NNSA Deputy Administrator for Defense Programs (NNSA/DP).

The changes being made at NNSA will facilitate long-range planning and the preparation of a comprehensive 5 year budget, which are critically important. The Stockpile Stewardship Program faces many competing demands for available resources. Difficult trade-off decisions will have to be made. NNSA must balance evolving requirements for directed stockpile work, the need for vigorous campaigns to prepare stockpile stewards for the more challenging issues that will arise as weapons continue to age, and required investments in research and production facilities and people.

We will greatly benefit from enhanced 5 year planning because it will establish reliable future program bases at each of the laboratories and production facilities, which greatly helps in resource, workforce, and facility planning. Completion of the Nuclear Posture Review has also been an important step in defining future program policy direction. Livermore's expertise in many nuclear-weapons issues is a national resource that has contributed to these deliberations. Enhanced 5 year budget planning and the outcome of high-level reviews are also important for the future of our laboratory's nonproliferation and arms control programs.

Integrated Program Management and Execution

Integrated program management and execution is critical to the success of the Stockpile Stewardship Program. The three major program elements—surveillance, assessment and certification, and refurbishment—are tightly interconnected. So are the activities of the three laboratories, the production plants, and the Nevada Test Site. Livermore has many close partnerships and working relationships with other

sites in the weapons complex. As one of the two nuclear design laboratories, we have particularly important formal certification responsibilities. The laboratory also operates a number of unique, state-of-the-art experimental and computer facilities that are essential for both assessment of stockpile performance and certification of refurbishment actions.

The Stockpile Stewardship Program is formally managed by NNSA/DP through three overarching sets of activities: Directed Stockpile Work, Campaigns, and Readiness in Technical Base and Facilities. NNSA/DP uses this breakout to make evident program integration, establish more clearly program goals and budget priorities, and help to identify program risks if there are budget shortfalls. The integrated program activities include:

- **Directed Stockpile Work.** Directed Stockpile Work supports the readiness of weapons and includes activities to meet current stockpile requirements. The effort includes weapon maintenance, comprehensive surveillance, weapon baselining, assessment and certification, supporting research and development, and scheduled weapon refurbishments. It also includes other stockpile commitments, such as dismantlement and information archiving.
- **Campaigns.** Campaigns are directed at making the scientific and technological advances necessary to assess and certify weapon performance now and over the long-term. They develop and maintain specific critical capabilities that are needed to sustain a viable nuclear deterrent. Each campaign has milestones and specific end-dates designed to focus advanced basic and applied science, computing, and engineering efforts on well-defined deliverables related to the stockpile. The current set of 17 campaigns provides a planning framework for the program's research and development activities.
- **Readiness in Technical Base and Facilities.** "Readiness in Technical Base and Facilities" ensures that necessary investments are made in people and their supporting infrastructure. Readiness includes the fixed costs and the investments of the Stockpile Stewardship Program, and it aims to ensure the presence of: (1) high-quality, motivated people in the program with the needed skills and training; (2) a well-maintained, modern infrastructure—to support the activities of these people—that is operated in a safe, secure, and environmentally responsible manner; and (3) special experimental and computational facilities that must be developed and brought on line for stewardship to be successful in the long term.

A rigorous planning process has been established to clearly define programmatic milestones to be achieved within each of these program areas. The Stockpile Stewardship Program is now defined by a series of 5-year plans, one for each program element, describing goals and objectives. The 5-year plans, which were developed with participation by the laboratories, plants, and the test site, are accompanied by annual implementation plans with detailed milestones.

ACCOMPLISHMENTS AND CHALLENGES IN DIRECTED STOCKPILE WORK

Livermore is the design laboratory for four weapon systems in the stockpile: the W87 and W62 ICBM warheads, the B83 bomb, and the W84 cruise missile warhead. They are expected to remain in the stockpile well past their originally anticipated lifetimes; the W62 already has. Significant effort is being expended on weapons surveillance and baselining, on assessing the weapons' performance, and on maintenance and selective refurbishment. We have just completed a major effort to extend the stockpile life of the W87 warhead, and Livermore and Sandia/California have been assigned the responsibility for the engineering development work to refurbish the W80, a Los Alamos-designed weapon.

Stockpile Surveillance and Baselining

Our stockpile surveillance efforts focus on assessing the condition of Livermore designs in the stockpile and on understanding the effect of aging on weapons in the stockpile. Aging is important because it affects the physical characteristics of materials, and we must determine how these changes impact weapon safety and performance. With a better understanding of aging, our stockpile surveillance can be more predictive, making possible systematic refurbishment and preventative maintenance activities to correct developing problems. An important factor here is to be able to detect subtle changes to the weapon system well in advance of the change causing a safety, reliability, or performance issue. This is essential to prepare for upgrades or life extension efforts that may take many years to fully implement.

As we gather more data and gain experience, we review and upgrade our surveillance programs—refining sampling plans, measuring additional attributes, introducing new diagnostic tools, and improving analysis methods. We are also taking on responsibility for surveillance of pits from Livermore-designed weapons in the stockpile to better balance the workload. These activities had been conducted at Los Alamos.

In addition, we are improving the sensors and techniques used to inspect all stockpiled weapons. In concert with the Enhanced Surveillance Campaign and as part of the Directed Stockpile work, we have developed processes to deploy newly emerging diagnostics into the core surveillance program. These diagnostics are enabling us to better diagnose and quantify the condition of the stockpile, and to identify aging characteristics at the earliest possible time. For example, Livermore, in cooperation with Y–12, has completed the development of an analytical model and the development and deployment of a suite of diagnostic tools that enable us to understand the aging behavior of secondary assemblies. We are also completing development of high-resolution x-ray tomography for imaging weapon pits; first phase deployment at LLNL is complete and has been demonstrated, and deployment at Pantex is continuing. Furthermore, development continues of high-energy neutron radiography for nondestructively detecting small voids and structural defects in weapon systems.

Stockpile Safety and Performance Assessments

Assessments of the safety and performance of stockpiled weapons and modification actions must be demonstration based—that is, grounded on existing nuclear test data, non-nuclear tests, fundamental science experiments, and simulations using validated computer models. To the extent possible, non-nuclear tests are used to assess weapon safety and performance. Together with past nuclear test results, they also are used to validate computer simulations. Once validated to the extent possible, these simulations guide expert judgment in making complete, integral assessments of stockpile issues. Such demonstration-based assessments underpinned Livermore's W87 stockpile life extension program (discussed below) and will provide similar support to our W80 life extension work. In addition, this methodology is applied to the assessment of issues that arise in the course of ongoing stockpile surveillance and is the foundation of our annual certification assessments.

Annual Stockpile Certification. Annual certification of the stockpile is fully reliant on the laboratories' assessment capabilities. Formal review processes for certification of weapon safety and reliability in the absence of nuclear testing have been established as part of the Stockpile Stewardship Program. It is essential that judgments and decisions made by the stockpile stewards are credible among themselves, to DOD and others in the nuclear weapons community, and to the administration and Congress, and the annual certification process is an essential means to that end.

Annual certification is based on the technical evaluations made by the NNSA Laboratories and on advice from the laboratory directors, the Commander in Chief of the U.S. Strategic Command, and the Nuclear Weapons Council. In the course of annual certification, our laboratory collects and reviews all available information about each stockpile weapon system, including physics, engineering, and chemistry and materials science data. This work is subjected to rigorous, in-depth review by scientists, engineers, and managers throughout the program. In addition, it is reviewed by several DOD groups. Livermore completed its support of the 2001 annual certification cycle in September 2001, when I sent my annual certification letter to the Secretaries of Energy and Defense. In conjunction with their colleagues at Sandia, Livermore personnel are now well into the 2002 cycle and are on a pace to complete our support of that cycle on schedule.

Stockpile Maintenance and Refurbishment

Each year, the Nuclear Weapons Stockpile Plan sets the requirement to maintain a safe and reliable nuclear weapons stockpile, and it specifies the number of weapons of each type to be in the stockpile. Among other responsibilities, the DOD establishes military requirements, which are incorporated into the plan. These requirements drive the Directed Stockpile Work workload for NNSA, particularly in the resource-intensive area of refurbishment activities and life-extension programs. The W87 life-extension program is in its production phase and activities are planned for the B61, W76 and W80 systems.

The W87 Life Extension Program. In April 2001, Admiral Richard Mies (Commander in Chief of U.S. Strategic Command) and General Gordon visited Livermore to celebrate certification of the life-extension refurbishment of the W87 ICBM warhead. Formal certification was completed with signing of the Final Weapon Develop-

ment Report by Sandia Director Paul Robinson and myself. This first completed certification of a warhead refurbished through a life-extension program (LEP) is a groundbreaking milestone for the Stockpile Stewardship Program. It demonstrates effective cooperation of the laboratories and the production facilities to overcome physics, engineering, and manufacturing challenges to meet DOD requirements without conducting a nuclear test.

The development activities for this program included extensive flight testing, ground testing, and physics and engineering analysis. High-fidelity flight tests, incorporating the latest technological advances in onboard diagnostic instrumentation and telemetry, provided added confidence in the reliability of the design modifications. Assessment of nuclear performance is based on computer simulation, past nuclear tests, and new above-ground experiments that addressed specific physics questions raised by the engineering alterations and computer simulations.

The objective of the W87 LEP was to enhance the structural integrity of the warhead so that it may remain part of the enduring stockpile beyond the year 2025 and meet anticipated future requirements for the system: the W87/Mark 21 is planned as a single RV option for the Minuteman III ICBM. The first production unit was completed at the Pantex Plant in February 1999, and production is proceeding on schedule for completion early in 2004.

Life Extension of the W80. Under the direction of the Nuclear Weapons Council, the W80 Project Officers Group (POG) is pursuing an LEP for the W80 cruise missile warhead, which was developed by Los Alamos and Sandia/New Mexico. A formal study that defined refurbishment options and their feasibility (known as a 6.2 study) was completed in 2000. Livermore and Sandia/California participated as an Interlaboratory Peer Review team. In this role, the California team evaluated proposed modifications to the warhead for feasibility, aging effects on the modifications, impact to the DOE complex, and production issues. The W80 POG has selected a final refurbishment option for the LEP, and NNSA has assigned the associated engineering development task to Livermore and Sandia/California. This assignment better balances the workload among the laboratories and provides a vehicle for the laboratory to develop the skills of the next generation of stockpile stewards. The California laboratories will also be the design agencies for certifying the safety and reliability of the refurbished warheads, the W80 Mods 2 and 3. Los Alamos and Sandia/New Mexico will continue to be responsible for certification of the W80 Mods 0 and 1.

During 2001, the New Mexico and California teams completed a baselining study to establish a modern understanding of the current W80 and its performance. Livermore is now continuing to conduct above-ground experiments and simulations on the current warhead in preparation for beginning work on the LEP modifications. At this time there is a congressional hold on NNSA work for the LEP as the Air Force defines its plans for parallel life extension work on the cruise missiles themselves.

ACCOMPLISHMENTS AND CHALLENGES IN STOCKPILE STEWARDSHIP CAMPAIGNS

As I have earlier described, stockpile stewardship campaigns are focused, technically challenging, multifunctional efforts that address critical capabilities that will be needed to achieve certification of stockpiled weapons as more challenging issues arise. Eight campaigns are aimed at providing the scientific understanding needed to certify the nuclear weapons stockpile and to support required weapon modernization in life extension programs. Three additional campaigns focus on weapon engineering. They provide specific tools, capabilities, and components in support of weapon maintenance, modernization, and refurbishment, as well as certification of weapon systems. The final six campaigns support readiness by focusing on sustaining the manufacturing base within the weapons complex. Examples of Livermore's major contributions to these multi-site campaigns are highlighted below.

Experiments, Theory, and Modeling to Better Understand Plutonium

One of the major success stories of the Stockpile Stewardship Program is the significant improvement we are making in understanding the properties of plutonium. This is a very important issue—we need to understand aging in plutonium and the effect of aging-related changes on the performance of an imploding pit of a stockpiled weapon. The required capacity of the production complex depends on the anticipated lifetime of plutonium pits in the stockpile. An accurate assessment is necessary. If we under estimate the lifetime of pits, we may over invest in facilities to remanufacture plutonium parts. If we over estimate the lifetime of pits, the Nation could find itself critically short of capacity for plutonium operations when it is vitally needed.

Laboratory Experiments and Modeling. Available information indicates that plutonium used in pit applications is stable; however, we must assess the effects of long-term aging. Plutonium's properties are among the most complex of all the elements. To study the subtleties of plutonium, we have combined advances in theoretical modeling with the use of sophisticated experiments. For example, we are using old pits and accelerated-aging alloys to determine the lifetime of pits. Accelerated-aging samples are plutonium alloys with a mixture of isotopes to increase the rate of self-irradiation damage so that the material "ages" faster.

Data from our materials, engineering, and dynamic experiments show, so far, that pits are stable. Livermore has conducted important experiments on old pits using advanced materials characterization tools such as our Transmission Electron Microscope, the most powerful such instrument in the NNSA complex. Using the Transmission Electron Microscope, we have discovered nanoscale (10^{-9} inch) bubbles that are likely filled with helium in the microstructure of aged plutonium. The plutonium appears to be accommodating the helium, which is created through self-irradiation, in a stable form. The presence of these bubbles was predicted theoretically using computer simulations of the radiation damage process.

Experiments at the Nevada Test Site. Livermore is conducting sub-critical experiments at the Nevada Test Site to investigate the properties of plutonium shocked and accelerated by high explosives. Matter can be ejected from the free surface of materials that undergo shock. The experiments characterize ejecta, which is thought to affect the performance of primaries in weapons. Performance is being studied as a function of plutonium age as well as surface finish and manufacturing technique. Results will affect estimates of pit lifetime and decisions about future production of replacement pits, and improve our fundamental understanding of performance.

Unlike our first three subcritical experiments, tests in the current Oboe series are performed inside individual confinement vessels. Eight of the nine planned Oboe experiments have been completed, two of them in 2001. By using small expendable vessels, up to 12 separate experiments can now be conducted in the same underground test chamber—the zero room—over several years. Following the test, after the chamber is determined to be contamination-free, personnel are allowed to enter the zero room to retrieve films and data. The use of the vessels for subcritical experiments is resulting in significant cost reduction and improved data return. In the past, each subcritical experiment followed a complex schedule with time-consuming preparations, and after each test, the zero room, with all its diagnostic equipment, was permanently contaminated and could not be reused.

In addition, we are bringing into operation the Joint Actinide Shock Physics Experimental Research (JASPER) Facility at the Nevada Test Site, a two-stage gas gun for performing shock tests on special nuclear materials. JASPER experiments, which are planned to start during this fiscal year, will complement other experimental and modeling activities by providing scientists more precise equation-of-state data at extreme conditions than can be obtained from other types of experiments. To support the planned JASPER experiments, two inert-atmosphere gloveboxes have been installed in the Device Assembly Facility (DAF). These gloveboxes will be used to assemble the special nuclear material targets into their final experimental configuration. We are now performing the final design modifications to the target chamber necessary to qualify the facility for use with plutonium.

Modeling and Experiments to Probe Weapon Performance

The Contained Firing Facility/Flash X-Ray Facility. Hydrodynamics testing is the most valuable experimental tool we have for diagnosing device performance issues for primaries in stockpiled weapons. Through hydrodynamics experiments conducted at Livermore's Site 300 and the Dual-Axis Radiographic Hydrodynamic Test Facility (DARHT) at Los Alamos, weapon scientists are able to characterize the energy delivered from the high explosives to a mock pit, the response of the pit to hydrodynamic shocks, and the resulting distribution of pit materials when they are highly compressed. These three pieces of information are critical for baselining weapons, certifying stockpile performance, and validating hydrodynamics simulation codes.

Over the past decade, we have made tremendous advances in the development of diagnostics capabilities and experimental techniques used in hydrodynamic testing. We are now able to gather far more revealing data from hydrodynamic tests than was possible when we developed the weapons that are now in the stockpile. The most sophisticated type of hydro experiment is the "core punch," in which scientists use high-energy radiography to record a digital image of the detailed shape of the gas cavity inside a pit when it is highly compressed. In 1998, we carried out the first core punches on two important stockpile primary devices: the W76 SLBM warhead and the B83 strategic bomb.

The Flash X-Ray Facility was shut down in 1999 and work began on an upgrade that will contain the debris created by explosive testing. Construction of the Contained Firing Facility is now finished, and the qualification testing has been completed to assure its ability to contain debris from experiments that use up to 60 kilograms of high explosives. The first stockpile-related experiment was executed last month. Livermore is now able to conduct these critically important experiments with isolation from the surrounding environment.

Three-Dimensional Simulation of a Nuclear Weapon Explosion. Our hydrodynamic testing of mock primaries is complemented with a vigorous simulation program that achieved a remarkable milestone in October 2001. The first-ever three-dimensional simulation of a full-system nuclear weapon explosion was completed using the ASCI White computer at Livermore. Demonstrating the ability to use a single code to simulate in three dimensions the operation of a full weapon system, from primary implosion through secondary explosion, marks a major step forward in our weapon simulation program. This achievement demonstrates an unprecedented capability for addressing the complex 3D behavior expected from an aging stockpile.

The complex computer model that was used, called a "burn code," employs tens of millions of zones—hundreds of times more than a comparable two-dimensional simulation. The work was completed through an intense, sustained effort that involved weapons code developers and computer support personnel. It required innovative three-dimensional algorithms able to represent the relevant physical processes and run efficiently on the machine's parallel architecture. The simulation ran a total of 43 days on 1,024 processors of the ASCI White computer and produced tens of terabytes of data. Analyzing and preparing the data for visualization again required the parallel processing capability of ASCI White. This post-processing enabled our weapon scientists to get an accurate and detailed picture of the full operation of the weapon from beginning to end.

Modeling and Experiments of High-Explosive. Some of the most technically challenging problems involve modeling the chemistry of detonation occurring at conditions up to 500,000 atmospheres pressure and many thousands of degrees centigrade. Conventional explosives have been successfully modeled in the past using the assumption of instantaneous reaction rate. The most advanced weapons in the stockpile use insensitive high explosives in which the detonation reaction rates are much slower. Livermore scientists have now linked a sophisticated chemistry code, Cheetah, to the hydrocode ARES. In the simulations of detonation, ARES determines the motion of the materials, Cheetah provides at each time step the state of chemical reactions and equation-of-state data for the relevant intermediate and final reaction products, which affects subsequent hydrodynamic performance. Although the work is in the early stages, simulations are identifying detonation phenomena not previous resolved.

The safety of the stockpile continues to be of paramount importance. Although we believe that the stockpile is safe, the vulnerability of nuclear weapons to complex stimuli involving fire, mechanical crush, and shock remains a critical issue. To help meet this assessment challenge, we have developed the capability in the ALE3D code to simulate a weapon in a coupled thermal-chemical-mechanical-hydrodynamic environment, which is typical of a weapon in a fire scenario. An experimental effort is collecting fundamental material property data from which models are developed and then implemented in ALE3D. This capability is being used to help assess both weapon safety and safety issues at the Pantex Plant.

High-Energy-Density Weapon Physics (HEDP) Calculations and Experiments

To determine the performance of thermonuclear weapons, we need to accurately model how various types of radiation interact with their surroundings. The fundamental physical processes are particularly complex in the dynamic high-energy-density conditions present during the functioning of a weapon. Materials behave very differently at star-like pressures and temperatures. Modeling weapon performance is made even more difficult by the fact that many of the issues we need to consider are inherently three-dimensional. Weapons have been designed as one- or two-dimensional objects but they are in detail three-dimensional and age three dimensionally (e.g., cracks or other irregularities). To address these issues in the absence of nuclear testing requires high fidelity three-dimensional modeling that requires the computing power that ASCI promises to deliver. It also demands experimental facilities and capabilities that can generate data in the relevant regimes to develop and validate these models.

High-Energy-Density Physics Experiments. Extraordinary progress continued to be made during the past year toward developing quantitative metrics for stockpile assessment and warhead certification. Analysis based on these metrics has been the basis for defining a detailed experimental weapons-physics program to be conducted

at HEDP facilities. The Omega laser at the University of Rochester and the Z Machine at Sandia continue to be used effectively to examine physics issues important to improving our understanding of weapon performance, and to aid in the design and planning of future NIF experiments. For NIF, which will deliver nearly 60 times the energy density of Omega, we are actively working to develop the associated experimental infrastructure required to support those experiments. Although the assessment and warhead certification approaches of the national laboratories differ, they all require an enhanced understanding of HEDP weapon behavior as an essential component of their Stockpile Stewardship Programs. We are jointly exploring ways to collaborate closely on topics of mutual interest in this area while attempting to maintain a necessary level of independence in order to assure independent peer review of critical stockpile issues.

High-Energy-Density Physics Modeling. Livermore researchers achieved a number of major three-dimensional HEDP simulation milestones during the past year. Two major milestones in 2001 were the first-ever three-dimensional simulation of the thermonuclear performance of a weapon secondary and the three-dimensional simulation of the integrated performance of a modern two-stage nuclear weapon. In addition to the codes developed to simulate nuclear weapon performance, the laboratory continues to develop the three-dimensional code HYDRA. In 2001 HYDRA was used to simulate the performance of targets being designed to achieve ignition and thermonuclear burn on the NIF in three dimensions. The simulations conducted this year included the first ever-integrated three-dimensional simulation of the entire ignition target (hohlraums and fusion capsule). All of the work cited above was carried out at the laboratory using the ASCI White supercomputer.

ACCOMPLISHMENTS AND CHALLENGES IN TECHNICAL BASE AND FACILITIES

Assessments of weapon performance and certification of weapon refurbishments must be based on scientific and engineering demonstration to be credible. In the absence of nuclear testing, we rely on data from past nuclear tests as a benchmark, component-level experiments and demonstration, and advanced simulations for an integrated assessment of weapon performance and safety. This approach has enabled us to successfully certify the W87 life-extension refurbishment and address stockpile issues that have emerged to date. However, as the stockpile ages, we anticipate that more difficult issues will arise.

These needs—to be able to assess and certify both weapon performance and refurbishment actions—drive the Stockpile Stewardship Program's investments in much more capable experimental facilities, such as the NIF, the Dual Axis Radiographic Hydrodynamic Test Facility and even more advanced hydro-test capabilities, and greatly enhanced numerical simulation tools developed through the Advanced Simulation and Computing (ASCI) program. We are not progressing as quickly as we could to acquire these greater capabilities because of competing needs for Stockpile Stewardship Program resources that must be balanced. The program must meet requirements for Directed Stockpile Work (e.g., life-extension programs) and pursue vigorous campaigns in weapons science and technology. In addition, the nuclear weapons complex is in need of infrastructure recapitalization to support all of these activities. Program success requires both efficient, flexible, and modern manufacturing facilities and a work environment at the laboratories and production facilities that makes it possible to attract and retain an exceptional staff. Here, the discussion focuses on two areas where much more capable research facilities are required—NIF and ASCI—and on the need for infrastructure reinvestment.

The National Ignition Facility

Construction is continuing at Livermore on the NIF, a major research facility housing a 192-beam laser and associated experimental capabilities. NIF will be the world's largest laser, delivering 60 times more energy density than the Omega laser at the University of Rochester (and the previous Nova Laser at Lawrence Livermore), currently the largest laser in the NNSA High Energy Density Science program. NIF will provide 1.8 megajoules of ultraviolet laser energy that can be used to compress and heat a small capsule filled with deuterium and tritium to conditions at which thermonuclear fusion occurs. NIF is a cornerstone and essential element of the Stockpile Stewardship Program. It will also provide scientific and technical information that may eventually lead to practical fusion energy production.

The baseline plan and schedule for NIF was included in General Gordon's certification of the NIF project, provided to Congress on April 6, 2001. The schedule provides for project completion at the end of fiscal year 2008, and the NIF team's goal in the coming year is to achieve "first light" by delivering four laser beams to the target chamber. The fiscal year 2002 budget provides $245 million for continued NIF construction and the fiscal year 2003 budget provides the requested $214 mil-

lion. The pace of construction has now been constrained over the past 2 years by available annual funding in the overall NNSA/DP budget, and the project could be completed significantly earlier at a lower total cost if more funding were available in the near term.

The Importance of NIF to Stockpile Stewardship. NIF is vital to the success of stockpile stewardship. It will be the only facility capable of well-diagnosed experiments to examine thermonuclear ignition and burn and to study the high-energy-density properties of primaries and secondaries in nuclear weapons. We need the facility for experimental study of key issues related to the effect of aging on weapons and for certification of the performance of refurbished weapons. In addition, NIF experiments provide the only available means for advancing critical elements of the underlying science of nuclear weapons. NIF experiments will provide necessary data for sophisticated computer simulation models being developed for stockpile stewardship, and the models themselves need to be tested in the physical conditions that only the NIF can provide. Finally, NIF will help to attract and train the exceptional scientific and technical talent that is required to sustain the Stockpile Stewardship Program over the long term.

In April 2001, NNSA released the report of the High-Energy-Density Physics (HEDP) Workshop, held January 30-February 2, 2001. This report reconfirmed NIF's essential role in the Stockpile Stewardship Program and recommended that NIF be completed to its full 192-beam configuration on its baseline schedule. The Workshop Panel included representatives from DOE, NNSA, DOD, the three NNSA Laboratories, and Argonne National Laboratory. They reviewed presentations by experts in weapons design, high-energy-density science (HEDS), and Inertial Confinement Fusion (ICF) from the three laboratories that discussed options for NIF deployment, other HEDS facilities that can complement NIF, and Stockpile Stewardship Program needs for HEDS and weapons experiments/calculations for future stockpile certification.

NIF Project Technical Progress and Accomplishments. Overall the NIF project is more than 60 percent complete. Major progress continues to be made and at a rapid pace. In September 2001 the NIF conventional facilities construction, a $270 million project, was completed on schedule and on budget. In October, the Project completed installation of one-quarter of NIF's beampath infrastructure. Now in place are the precision-cleaned enclosures for the components of 48 laser beams. A strong partnership between the laboratory, Jacobs Facilities Inc. (the contractor for installation, management, and integration), and the local building and crafts trade unions have enabled the Project to achieve these key milestones. We are continuing to install NIF infrastructure and at the end of March we have nearly one half or 96 laser beams worth of precision-cleaned enclosures installed.

The NIF team continues to make outstanding technical progress. Last year I cited numerous examples of progress on crystals, laser amplifier glass and optics damage mitigation. Now nearly 80 percent of the required 3,072 high-quality laser-glass slabs are in hand, and over half of the large crystals used for optical switches and frequency conversion have been grown. This year we have made even greater progress on the development of new optics polishing techniques that can reduce the damage potential of NIF optics much more than our requirements. We are currently implementing these new techniques at our vendors to provide the first optics for NIF's final focusing systems.

NIF's clean-room facilities are being commissioned, and production has begun on some components. Validation of NIF's clean assembly, transport, and installation requirements was demonstrated with the installation of a laser-glass slab assembly into NIF's main amplifier. In addition:

- We have begun installing equipment into NIF's core area for generating seed laser pulses, controlling the entire laser system, and powering the laser amplifiers.
- We are nearing the point where we will begin installation of actual laser components, glass, optics, crystals, flashlamps, etc. for the operation of the first four laser beams in the coming months.

In the coming year the NIF team's goal is to achieve "first light" by delivering four infrared laser beams through the entire laser chain into a diagnostics station. Soon after, these four laser beams will be transported to the final optics assembly where they will be converted to ultraviolet light and focused to the center of the target chamber. This achievement will serve to provide validation and confidence in all of NIF's systems and will allow operational activities to commence. As more of NIF comes on line, fundamental physics regimes for materials science, high-energy-density science, and thermonuclear ignition and burn will become accessible for

study. NIF will provide temperatures and pressures needed to validate computer codes and address important issues of national security and basic science.

Reviews of the NIF Project. Over the past 2 years, regular reviews of the NIF Project have been held every 6 months. These reviews are managed by NNSA Office of Defense Programs and bring together experts in a variety of technical, fiscal, and project management fields to thoroughly review the status of the NIF construction project. The most recent review was held in November 2001. Mr. Willie Clark, from NNSA's Office of Project Management and Engineering Support, led this review. The findings and conclusions of this review included:

- The project has made impressive progress and has been responsive to previous review team recommendations.
- A strong management team is in place; the NIF Project organization is functioning very effectively.
- Significant safety improvements have been made.
- Effectiveness of NNSA oversight has improved.

In addition to these semi-annual reviews, NNSA staff in the Office of the NIF Project attend regular monthly Project reviews held at Livermore. These reviews provide detailed status reports and assessments of cost and schedule for the Project. We also provide quarterly reports on the NIF's construction project to the Deputy Secretary of Energy.

Preparation for NIF's Experimental Program. With the rapid progress being made on the NIF Project, we are at once pleased and concerned that experiments on NIF are becoming a reality in the coming year. We are pleased because NIF's promising role in the Stockpile Stewardship Program will become evident even with the first few laser beams, which will provide more energy than the entire Omega laser, the world's largest currently operating laser system. We have planned a campaign of experiments for the first phase of NIF operations that will help provide important scientific data on stockpile-relevant materials and that may help us to enhance our ability to reach fusion ignition using large short-pulse laser systems.

I am also concerned because the experimental program for NIF and for other high-energy-density science facilities is being placed under great pressure because of reductions in funding in the fiscal year 2003 budget. These reductions place our experimental program in jeopardy by preventing the timely development and fielding of NIF's core diagnostic systems that are essential for collecting the data from experiments. We are also facing delays in the development and fabrication of the cryogenic target systems required for ignition experiments on NIF. Delay of these critical programs reduces our ability to provide NIF as a key facility for stockpile stewardship and impacts scheduled availability for upcoming Stockpile Life-Extension Programs.

We are currently working with NNSA and General Gordon to better understand our options for fiscal year 2003 for these programs. Current projections, however, are not positive for providing for the effective utilization of NIF as it comes available in the next year.

The Advanced Simulation and Computing (ASCI) Program

The Advanced Simulation and Computing (ASCI) program (formerly called the Accelerated Strategic Computing Initiative) is greatly advancing our ability to computationally simulate the performance of an aging stockpile and to certify the details of refurbishment projects. To make the needed major advances in weapons science and engineering simulation codes, Lawrence Livermore, Los Alamos, and Sandia national laboratories are obtaining from U.S. industry dramatic increases in computer performance and information management. The ASCI program is integrating the development of computer platforms, simulation applications, and data management technologies. It will take a string of successive investments to achieve ASCI's long-term goals.

Livermore's partnership with IBM has been highly successful. We took delivery of ASCI Blue Pacific in fiscal year 1998 and then ASCI White in fiscal year 2000. Both machines exceeded their performance requirements and are being used to support stockpile stewardship through a variety of applications, some of which I have discussed. The important next step in ASCI at Livermore is a supercomputer capable of 60 to 100 TeraOps (trillion operations per second). It is planned for late 2004. Necessary funding was received in fiscal year 2002 to begin construction of the Terascale Simulation Facility to house this computer. The building will be available in time to accept it.

ASCI White Successfully Meets Tri-Laboratory Needs for Stockpile Stewardship. In 2001, the laboratory was home to the world's most powerful supercomputer, the IBM ASCI White machine, which is capable of 12.3 TeraOps. It was the latest step in ASCI's ambitious efforts to rapidly advance the state-of-the-art in computers,

computational models, and data management tools needed to simulate the performance of nuclear weapons. It represented the first "most capable" system in the NNSA complex, a system of unique capability and the major resource for all three laboratories, two computing at a distance.

ASCI White is based on the next-generation IBM processor, node, and switch technology. It consists of 512 nodes, each with 16 processors. Exceeding its contractual performance requirement of 10 TeraOps, the machine is about a factor of three faster than Livermore's Blue Pacific computer, which was used to perform the first ever 3D simulation of the full functioning of a nuclear weapon primary. The machine also provides over 8 trillion bytes (terabytes) of main memory and about 110 terabytes of global disk space. This system was successfully used and shared since early 2001 by all three NNSA Laboratories. To meet each laboratory's requirements to run problems, calculations were interleaved in an integration schedule for the machine. Livermore successfully completed a three-dimensional secondary burn simulation in June 2001. The calculation demonstrated the modeling of 3D features at unprecedented resolution and validated scaling for several physics algorithms.

Calculations done by Los Alamos and Livermore for the three-dimensional prototype full-system coupled simulation were both completed on ASCI White in late 2001. The size and scale of ASCI White allowed the two laboratories to employ a level of spatial resolution and depth of physics models that were heretofore completely beyond reach in 3D. The speed, large memory, and stability of White were essential elements contributing to the successful series of calculations executed to accomplish these calculations. Similar problems are now being run in support of additional calender year 2002 and calendar year 2003 programmatic deliverables. Sandia also used ASCI White to perform structural dynamics calculations for different environments that weapons might encounter. One terabyte of core memory was used on each structural dynamics calculation in simulations that were completed in late September 2001 and set many world records. These calculations demonstrated effective use of computing capabilities at a distance.

Simulation Modeling and the Problem-Solving Environment. ASCI is more than powerful computers; it is the development of advanced simulation techniques as well as data management and visualization tools. Three Gordon Bell Awards, two in 1999 and one in 2000, exemplify the outstanding simulation development capabilities at Livermore and a growing base of expertise in using the machines. Most notable was the 1999 Gordon Bell Award for best performance in supercomputing. A team led by Livermore researchers, with collaborators at the University of Minnesota and IBM, solved a supercomputer problem with broad applications.

Work by Los Alamos scientists provides a directly relevant example of data management progress in 2001. They were able to use visualization techniques developed by ASCI for the three-dimensional full system coupled simulation mentioned earlier. These tools allowed the scientists to run this calculation of unprecedented size on the Livermore 12-TeraOps system and then utilize the 32-node visualization partition on that computer to distill the data, send it back to Los Alamos, and interactively visualize the simulation results at Los Alamos. This capability was critical to enable Los Alamos' effective use of the system. The data not necessary for visualization was stored at unprecedented rates on the Livermore archive. For this particular calculation, Los Alamos stored 12.6 terabytes (roughly equivalent to 12 million novels) in 13 hours in the Livermore archive, approximately 50 times faster than would have been possible just 2 years earlier. Such advances in storage capability were necessary for the environment to function. They demonstrate the inherent balance necessary and careful planning undertaken in the ASCI simulation enterprise.

Beyond ASCI White and the Terascale Simulation Facility. The next supercomputer at Livermore after ASCI White will move us much closer to ASCI's goal of full-scale simulation of weapons performance using advanced physics models with data derived from extensive, first-principles physics simulations. The threshold for that capability is 100 TeraOps, and reaching the goal quickly is vital to success in stockpile stewardship. Plans call for ASCI "Q" (30 TeraOps) to be operational at Los Alamos in 2002, a 20-TeraOps machine at Sandia in 2003, and a 60- to 100-TeraOps machine for Livermore late in 2004. At the onset of the Stockpile Stewardship Program, ASCI set as a goal the delivery of a 100 TeraOps computer by 2004. The machine at Livermore will be as close to 100 TeraOps as can be afforded within budget limitations. It is important that plans for the 60- to 100-TeraOps machine not slip.

The 60- to 100-TeraOps machine will be very large, and will require the Terascale Simulation Facility (TSF) to house it. The congressional line-item funding for this project was sufficient to enter into a construction contract this year. This contract was recently signed and the groundbreaking ceremony occurred on April 4, 2002. The TSF will consist of a two-story computing facility with power and space to ac-

commodate a 100-TeraOps-class system; assessment areas and networking control areas necessary for direction and assimilation of data; and a four-story office structure for staff to manage and utilize the simulation environment. We expect about 24,000 square feet of the machine room (of the 48,000 square feet planned) to be available and fully equipped to accept an ASCI-scale system by June 2004, just a few months ahead of the arrival of the system.

The two machine rooms in TSF will guarantee our capability to site any system required by the program. The TSF will function more like an experimental facility than a computer center by supporting very close cooperation between staff and analysts. Round the clock support for major runs, restart capability for huge simulations, vast storage archives, first-class data assessment facilities and on-the-fly trouble shooting will support a mode of operations where "runs" will be viewed as "shots," analogous to nuclear tests, requiring intense support to succeed. This was the model adopted by Livermore to support the White system, and it proved to be extremely successful.

Infrastructure Recapitalization

Stockpile stewardship requires major investments in new facilities and capabilities to make it possible for scientists and engineers to more thoroughly understand the performance of nuclear weapons. As discussed above, at Livermore these investments include construction of NIF and acquisition of ASCI supercomputers and the TSF. The Stockpile Stewardship Program will not succeed without the new-facility investments that are being made at the NNSA Laboratories. Scheduled programmatic work at the laboratories and the plants has also placed exceedingly high demands on provided funding. The cumulative effect of necessary continuing attention to the highest and most immediate priorities over the course of the Stockpile Stewardship Program has been shortage of funds to recapitalize NNSA's underlying infrastructure.

In fiscal year 2002, funding began for NNSA's new facility reinvestment initiative. The initiative focuses on those underlying infrastructure needs at NNSA sites in support of directed stockpile work and campaign programmatic requirements. Livermore fully supports the initiative and is already working on several high-priority recapitalization and disposition projects utilizing first year funding. At Livermore, only 68 percent of our employees currently reside in permanent space, and 53 percent of the temporary office space (trailers and modular buildings) is nearing or beyond end-of-service life. Overall, over 35 percent of Livermore's office and laboratory space is less than adequate and in need of rehabilitation. Our overall maintenance backlog is about $420 million if directly funded (with programmatic dollars, for instance). In addition, obsolescent equipment needs to be replaced. For example, the laboratory struggles to keep pace with rapid advances in telecommunications capabilities, which are critically needed to use our supercomputers efficiently and securely and to upgrade our business operations. In addition, we have legacy facilities from long-discontinued programs as well as unusable or unsafe laboratory space that must be decommissioned, decontaminated (where necessary), and demolished. Our legacy facilities and other excess marginal space require considerable up-front investments to rectify. We also have to invest so that buildings at Livermore meet present-day seismic safety codes and the latest, more demanding safety criteria.

Currently, we invest $8 to $10 million per year of overhead into reducing our maintenance backlog. Over the next 10 years, we estimate that Livermore will need an additional $25 million per year in new funding to apply to maintenance deficiencies, $10 million per year for demolition of its excess facilities, and $15 million per year to keep pace with technological changes. We will be working with NNSA to develop appropriate funding levels to address these concerns through the facility reinvestment initiative.

Our overall infrastructure recapitalization goal is to provide and maintain high quality, technologically state-of-the-art facilities capable of meeting current and future mission requirements effectively and efficiently. It is also important to note that sustaining the quality of our workforce is a particularly challenging task in view of the high demand in the private sector for skilled people. These upgrades will provide quality facilities in order to attract and retain the exceptional workforce that we need to accomplish our missions.

REDUCING THE THREAT OF PROLIFERATION OR TERRORIST ACQUISITION OF WEAPONS OF MASS DESTRUCTION

National security is threatened by the proliferation and potential use of nuclear, chemical, and biological weapons (collectively referred to as weapons of mass destruction, or WMD). The events of September 11, 2001, clearly demonstrated the vulnerability of free societies to devastation as a result of concerted efforts of ex-

tremists. Adding to this vulnerability are indications that terrorist groups, including the followers of Osama bin Laden, are attempting to acquire WMD. In addition, at least 20 countries, some of them hostile to U.S. interests, are suspected of or known to be developing WMD.

Livermore's Nonproliferation and Counterterrorism Program

Livermore is applying its nuclear expertise to the challenge of nuclear weapons proliferation. Because the threat of proliferation is not restricted to nuclear weapons and in response to legislation calling for enhanced U.S. capabilities against WMD proliferation, we are also developing the technologies, analysis, and expertise needed to help stem the proliferation of chemical and biological weapons. These activities build on the large investment in chemical and biological sciences at Livermore.

Our program in nonproliferation, arms control, and international security is tackling the problem of WMD proliferation across the entire spectrum of the threat. We take a comprehensive approach to the problem with activities to prevent proliferation at the source, to detect and reverse proliferant activities, and to counter WMD terrorism.

Improved scientific and technical capabilities are essential for WMD threat reduction. The NNSA's Office of Defense Nuclear Nonproliferation supports the bulk of the research and development activities that provide the technological base for those U.S. agencies with operational responsibility for characterizing foreign weapons programs and detecting proliferation-related activities, for detecting and mitigating the use of weapons of mass destruction against U.S. civilians, and for negotiating and monitoring compliance with arms reduction and other agreements.

Two aspects of the laboratory's contributions in 2001 to the National WMD nonproliferation effort are highlighted here:

- **Assisting Government Agencies Defend Against WMD Terrorism.** Long before September 11, 2001, Livermore was addressing the threat of WMD terrorism. We have developed technologies and tools to counter nuclear, chemical, and biological terrorist threats and are working closely with Federal, State, and local response agencies to ensure that our technological solutions meet real-world operational needs. Many of our counterterrorism technologies and technical capabilities have been deployed, before September 11 and in its aftermath, to assist State and local governments defend against WMD terrorism.
- **Preventing Proliferation at the Source.** Proliferation is most effectively halted at the source—of weapons-usable nuclear materials, of weapons-related technology, and of WMD expertise. We are a major player in the U.S.-Russian nonproliferation programs. These programs consist of an integrated set of activities to secure at-risk nuclear material in Russia, dispose of excess highly enriched uranium and plutonium, and assist in downsizing the Russian nuclear weapons complex by helping the Russian closed cities and weapons institutes develop self-sustaining commercial applications of their scientific and technical expertise.

Assisting Government Agencies Defend Against WMD Terrorism

Countering terrorism has been a central element of Livermore's national security mission for many years. The events of September 11 have lent new urgency to our efforts to apply the laboratory's technologies, tools, and expertise to assist state and local governments in preparing to defend against and respond to WMD terrorism. Effective defense against terrorism requires the integration of science and technology with emergency response operations, which in turn requires coordination and collaboration between research and development (R&D) institutions like Livermore and the various Federal, State, and local emergency response agencies. We have made important and unique contributions to counterterrorism preparedness, and with increased resources we could do even more.

Countering the Nuclear Threat. Our Nuclear Threat Assessment Program has provided comprehensive assessments of nuclear threats for more than 20 years. This program is also the Department of Energy (DOE) lead for assessing illicit trafficking in alleged nuclear materials. We apply long-standing Livermore expertise in nuclear materials, nuclear weapons, and device diagnostics to develop improved capabilities for dealing with radiological emergencies, including terrorist events. We are also a key participant in the DOE's national nuclear incident response groups, including the Nuclear Emergency Search Team (which deals with nuclear terrorism or extortion threats), the Accident Response Group (which responds in the event of an accident involving U.S. nuclear weapons) and the Radiological Assessment Program (which assists State and local agencies). Livermore maintains a deployable response

capability, called HOTSPOT, which can be deployed to any location by military aircraft to provide local radiological field support.

Specifically, the Radiological Assessment Program (RAP) provides technical and operational expertise to State and local agencies to mitigate the consequences of a radiological incident or emergency. It uses DOE and national laboratory experts with skills in assessing radiological and toxic contamination and the attendant risks to human health. The Livermore RAP team has primary responsibility for California, Nevada, Hawaii, and the U.S. Pacific Rim territories. It is called upon, on average, three to five times per year. In 2001, it responded to three requests for assistance along with normal exercises and training. Typically, RAP investigates containers suspected of housing radioactive materials, seeks the location of lost industrial or medical radioactive sources, and advises Federal, State, and local authorities on the consequences of a radioactive release or personnel contamination. RAP regularly drills with similar teams from other Federal agencies, State, local, and tribal governments as well as private companies and organizations. To deal with the latest emerging threats, RAP now includes training to recognize and respond to nuclear terrorism within the "nuclear triage" program being developed at DOE headquarters.

Livermore has developed a concept for correlated sensor networks for detecting and tracking ground-delivered nuclear devices or nuclear materials. A novel algorithm integrates data from the various sensors, together with information from other sources (e.g., an intelligent traffic system) to identify sources of concern, track their movement through the road network, and guide responders in intercepting the suspect vehicle. This concept has been successfully demonstrated in an urban environment. We have had discussions with the County of Los Angeles concerning deploying a prototype system in the county in order to gain real-world experience with the network in a congested metropolitan area and to work with the appropriate response agencies to develop a concept of operations.

Defending Against Bioterrorism. The biodefense capabilities that have been deployed in the wake of September 11 have, at their core, advances in biological detection instrumentation and DNA signatures made at Livermore and its sister laboratory at Los Alamos. We are developing gold-standard DNA signatures of top-priority threat pathogens (anthrax, plague, etc.) and are working with the Centers for Disease Control and Prevention (CDC) to validate these signatures and distribute them to public health agencies nationwide.

We have made technology breakthroughs in biodetection instrumentation, pioneering the miniaturization and ruggedization of both flow cytometry and DNA identification devices. Our miniature thermal cycler unit makes possible DNA amplification via polymerase chain reaction (PCR) and identification in minutes rather than the hours and days previously required. Livermore's miniaturized PCR technology has been licensed to private industry and forms the basis of today's most advanced commercial biodetection instruments (e.g., Cepheid's Smart Cycler, ETG's handheld biodetector).

The Biological Aerosol Sentry and Information System (BASIS), developed jointly by Livermore and Los Alamos, was deployed as part of the overall security strategy for the 2002 Winter Olympic Games in Salt Lake City. (Cepheid Smart Cyclers are the heart of the BASIS field laboratory.) In developing BASIS, Livermore and Los Alamos worked closely with the many law enforcement, emergency response, and public health agencies that would be involved in dealing with a bioterrorism event to develop appropriate sample handling (chain of custody), communications, and response protocols.

Atmospheric Modeling for Consequence Management. The Atmospheric Release Advisory Capability (ARAC), located and operated at the laboratory, is a national emergency response service for real-time assessment of incidents involving nuclear, chemical, biological, or natural hazardous material. ARAC can map the probable spread of contamination in time for an emergency manager to decide whether protective actions are necessary. ARAC is on call to respond to real incidents and can also be used to evaluate specific scenarios for emergency response planning, such as optimizing the siting of bioaerosol samplers or determining evacuation routes.

Since it was established in 1979, ARAC has responded to more than 70 alerts, accidents, and disasters and has supported more than 800 exercises. In addition to accidental radiological releases (e.g., Chernobyl, 1986; Three Mile Island, 1979), ARAC has assessed natural and manmade disasters (Mt. Pinatubo volcanic ash cloud, 1991; Kuwaiti oil fires, 1991). ARAC has also provided assessments to State and local responders to toxic chemical accidents (e.g., Richmond sulfuric acid cloud, 1993; Sacramento River Spill, 1991). State and local agencies can request ARAC support for actual releases or planning by contacting DOE's Office of Emergency Response or the ARAC program office at Livermore.

Chemical Analysis for Forensic Attribution. Timely and complete analysis of suspect chemicals can answer important questions related to nonproliferation, counterterrorism, and law enforcement. Our Forensic Science Center has assembled a unique capability for detecting and characterizing ultratrace levels of virtually any compound in any sample matrix. Expertise and instrumentation are available for complete chemical and isotopic analysis of nuclear materials, inorganic materials, organic materials (e.g., chemical warfare agents, illegal drugs), and biological materials (e.g., toxins, DNA). The Forensic Science Center also develops advanced laboratory and field capabilities for ultratrace analysis, including a portable (55-pound) gas chromatograph/mass spectrometer, field kits for thin-layer chromatography, and novel sample collectors using solid-phase microextraction.

The Forensic Science Center has begun the rigorous testing required to become the second U.S. laboratory certified by the Organization for the Prohibition of Chemical Weapons (OPCW), which is responsible for implementing the Chemical Weapons Convention (CWC). Under the terms of the CWC, all samples collected from inspected facilities must be analyzed at two OPCW-designated laboratories. The U.S. Congress mandates that all U.S. samples be tested in the U.S. Currently, the U.S. has only one designated laboratory, the Edgewood Chemical and Biological Forensic Analytical Center. Livermore will provide the second required facility.

Over the years, the Forensic Science Center has responded to many requests from law enforcement for assistance in forensic analysis of unique samples. The Center has been brought in to analyze the "cold fusion" explosion at SRI International, Supernote counterfeit bills, methamphetamine samples, biotoxins, suspect chemical-warfare specimens, and nuclear contraband. It has characterized explosive traces from the 1993 World Trade Center bombing, the Unabomber case, and the Fremont serial bomber; performed forensic sleuthing related to the Riverside "mystery fumes" case; and analyzed samples for the Glendale "Angel of Death" case. Locally, the Center assisted Livermore police by rapidly identifying a vapor that sickened response personnel at the scene of a suicide; once the chemical was identified (malathion), law enforcement agencies were able to take appropriate personnel-protection measures and complete their investigation.

At the height of the anthrax incidents, the Forensic Science Center was called upon to analyze a suspect powder found at a local business. Livermore scientists worked through the night to complete the analysis, confirming that the powder was harmless.

New Search and Inspection Technologies. There is a pressing need for technologies to improve the screening of passengers, baggage, and cargo. Candidate technologies, in various stages of development at Livermore, include computed tomography (CT), x-ray scanning, gamma-ray imaging, neutron interrogation, and ultrasonic and thermal imaging. We have recently established a national test bed for cargo container experiments. This facility will provide a nationally available test bed for determining whether inspection technologies in use and under development can be scaled to the magnitude of the shipping container problem. Outside agencies will be able to make measurements, using national laboratory or their own equipment and measurement techniques, on actual and mock weapons materials in actual cargo containers. Under DOE direction, Livermore will operate this test bed as a national service, providing a common basis for the comparison and evaluation of alternative approaches.

Two laboratory-developed search technologies demonstrated their applicability to counterterrorism response when they were deployed to the World Trade Center. The first, a micropower radar, can "see" many feet into concrete rubble and could be a valuable tool for search and rescue operations. The other, a remote monitoring instrument that uses hyperspectral data to detect and identify trace gas emissions, was flown over Ground Zero to characterize hazardous gases emanating from the rubble pile.

Avoiding Surprise about Adversaries. One of the most critical, yet difficult, elements of homeland security and counterterrorism is gaining insight into the capabilities, intentions, and plans of persons, groups, or States hostile to the U.S. Our International Assessments Program (Z Division) is one of the strongest capabilities in the country for analysis and research related to foreign nuclear weapons and other weapons of mass destruction, including early-stage foreign technology development and acquisition, patterns of cooperation, and foreign cyber threats. This capability is more important than ever before, as the bipolar (U.S.-Soviet) world has disintegrated into a melange of traditional allies, regional and tribal allegiances, and transnational extremist groups. In the aftermath of September 11, we provided intelligence analysts and assessments as well as information-operations tools and expert personnel to the U.S. Intelligence Community. Our assessments of foreign weapons programs and activities provide important input to policy makers and dip-

lomats as they develop strategies for U.S. responses to events affecting national security.

Risk and Vulnerability Assessments of Critical Facilities. Through our participation in DOE's Vulnerability and Risk Assessment Program, we have made systematic assessments of the threat environment, cyber architecture, physical and operational security, policies and procedures, interdependencies, impact analysis, risk characterization, and possible mitigation measures for the 2002 Winter Olympic Games in Salt Lake City, 11 electric and gas infrastructures, and several independent service operators (ISOs), including the California ISO during the past summer's electrical energy crisis.

We have analyzed the vulnerability of buildings, dams, and other structures to catastrophic damage from earthquakes and explosive events. For example, we have also evaluated the earthquake vulnerability of major bridge structures (including the Golden Gate and San Francisco-Oakland Bay bridges), the structural integrity of nuclear material shipping containers for a variety of impact scenarios, and the likely damage resulting from the explosion of natural gas storage tanks in a suburban environment.

Expert Personnel Assisting Homeland Security Agencies. A number of Livermore scientists serve on various task forces, committees, and advisory groups dealing with aspects of homeland security and counterterrorism. For example, a Livermore expert on x-ray imaging is a member of the National Academy of Science Committee on Assessment of Technology Deployed to Improve Commercial Aviation Security. Other laboratory scientists serve as technical advisors to the U.S. Customs Service, the National Guard, and the Los Angeles Emergency Operations Center, and as members or advisors to various Defense Science Board task forces addressing homeland defense. Still others are assisting the California State Office of Emergency Services (OES) with training related to weapons of mass destruction and as members of the California Council on Science and Technology, which is providing technical advice to the OES's State Strategic Committee on Terrorism.

Engineering a Novel Truck-Stopping Device. In October 2001, the Governor of California contacted Livermore requesting assistance to develop a means of stopping tanker trucks, to keep hijacked trucks from becoming motorized missiles. The objective was to make it possible to stop these large trucks using equipment readily available to peace officers, namely their vehicles and their weapons. A retired Livermore engineer and consultant teamed with laboratory engineers, technicians, and heavy equipment operators to develop a simple mechanical device to accomplish this. It can be readily attached to the back of a tanker truck. When bumped from the rear by the patrol vehicle, the device would cause the trailer braking system to lose air pressure automatically locking the trailer brakes. A prototype was demonstrated in Oakland in late November, and remote-controlled testing at high speeds was conducted at the Nevada Test Site in February and March.

Preventing Proliferation at the Source

With the collapse of the Soviet Union, 10 years ago, arose the threat of materials and expertise related to WMD leaking from Russia to terrorists or countries of concern. Lawrence Livermore is a major player in the U.S.-Russian nonproliferation programs, which are striving to stem proliferation at its source. These programs consist of an integrated set of activities to secure at-risk nuclear material in Russia, dispose of excess highly enriched uranium and plutonium, and assist in downsizing the Russian nuclear weapons complex by helping the Russian closed cities and weapons institutes develop self-sustaining commercial applications of their scientific and technical expertise.

In light of the current focus on countering terrorism, we must not lose sight of the importance of these and other nonproliferation programs. By securing weapon materials, technologies, and expertise at the source, we keep the raw ingredients for weapons of mass destruction out of the hands of proliferators and terrorists. Attempts to counter WMD terrorism without simultaneously working front-end issues will not solve the problem.

Protection and Control of Nuclear Materials and Accounting (MPC&A). The security of Soviet-legacy nuclear materials is critical to the security of the U.S. Through the NNSA's MPC&A Program, we are helping various Russian sites improve the protection of their fissile materials. Livermore specializes in vulnerability assessment, gamma ray spectroscopy, access control and security system integration, and information systems. We lead the MPC&A project teams for Chelyabinsk-70, Sverdlovsk-44, Bochvar Institute, and Krasnoyarsk-45 and provide project support for seven other sites.

Of the various laboratories involved in the MPC&A Program, Livermore is unique in its role with the Russian Navy. Since the work began in 1997, MPC&A upgrades

for four nuclear refueling ships have been completed and commissioned. Our activities at the Russian Navy facilities have been some of the most successful of the entire MPC&A Program. Success is attributable to the combination of a highly focused user (the Russian Navy), an excellent subcontractor and system integrator (the Kurchatov Institute), and a highly trained team of NNSA and national laboratory personnel that has built an excellent working relationship with the Russian personnel. In September 2000, MPC&A cooperation was formalized through an implementing agreement between the Russian Navy and the NNSA that included further cooperation at Russian nuclear weapon storage sites. Work at a number of these sites is under way and is meeting with the same success as previous activities with the Russian Navy.

We participate in the NNSA's Second Line of Defense Program, designed to curtail the illicit transport of items of nuclear proliferation concern from Russia. Together with other participating DOE laboratories, we are working with the Russian Customs Service to equip high-risk border crossings with radiation detection equipment. Moscow's Sheremetyovo International Airport complex and a port on the Caspian Sea were equipped in October 1998. Seven other sites (including several possible transit points to Iran or North Korea) have been identified as high priority, and equipment is being installed. This past year, we completed, jointly with our Russian collaborators, a training manual and curriculum that will be used by more than 30,000 front-line Russian customs officials. In addition, several training courses on dual-use export controlled items were developed and incorporated into the Russian Customs Academy's professional curriculum.

Downsizing the Russian Nuclear Weapon Complex. To help accelerate the downsizing of the Russian weapons complex and to prevent displaced weapons workers from seeking employment with potential proliferators, the U.S. and Russia have launched the Nuclear Cities Initiative (NCI), a cooperative program to create self-sustaining civilian jobs for displaced workers in the closed nuclear cities of Sarov, Snezhinsk, and Zheleznogorsk.

We are leading a medical technology development project with the Avangard Electromechanical Plant (a weapons assembly facility) at Sarov. In September 2001, lengthy negotiations led by Livermore scientists culminated in a formal partnership agreement between the Avangard Electromechanical Plant and Fresenius Medical Care (the world's largest provider of products for individuals with chronic kidney failure) to establish a commercial medical products manufacturing facility at Sarov. Eventually, the Avangard/Fresenius project will employ hundreds of former weapons workers in the production of dialysis equipment and treatment kits. This agreement represents a major milestone in U.S. efforts to engage a Russian serial production facility.

We are also involved in the NNSA's Initiatives for Proliferation Prevention (IPP), which focus on helping Russian research institutes find commercial nonweapons applications of their technical specialties. In spite of difficulties created by limitations on LLNL's ability to establish new contracts and requirements that IPP payments be free of Russian taxes, progress has been made on many existing projects. For example, LLNL has teamed with Cyclotec Medical Industries and the Biophysical Laboratory (Biofil) Ltd., a spin-off from the Russian Federal Nuclear Center Institute of Experimental Physics (VNIIEF, Arzamus-16), to develop and manufacture transcutaneous electrical nerve stimulation (TENS) devices for noninvasive treatment of traumatic short-term pain. TENS devices deliver low levels of electrical pulses that inhibit or interfere with the transmission of pain signals to the brain. Under this IPP project, TENS devices have been miniaturized and incorporated into adhesive-bandage- and orthotic- (splint and brace) type materials. The IPP-developed device is an order of magnitude smaller and lighter than products with similar functionality at one-quarter of the cost. The components for these devices will be manufactured in Russia and then shipped to the U.S. for testing and assembly. The total U.S. market for pain control products, pharmaceuticals, therapy, devices, and implants is estimated to be more than $2 billion. The U.S. National Institute on Drug Abuse (NIDA) has advised Cyclotec that it will recommend the use of the company's TENS products as "viable alternatives to drugs for pain relief."

Promoting Regional Security through Science and Technology Cooperation. As the current conflicts in Afghanistan and Israel highlight, regional conflicts are fraught with the potential to escalate rapidly, both in the level of violence and in the number of players. This escalation potential is particularly worrisome when the participants already possess or are striving to acquire weapons of mass destruction. In order to promote security and stability in these regions of concern, rather than attempting to intervene once conflict has spiraled out of control, we are supporting science and technology cooperation as a mechanism of engagement that is non-threatening and beneficial to all involved.

Together with the U.S. Geological Survey (USGS) and under the aegis of the United Nations Educational, Scientific, and Cultural Organization (UNESCO), we have collaborated with seismological organizations from Turkey, Lebanon, Israel, the Palestinian Authority, Jordan, Kuwait, Saudi Arabia, Egypt, Yemen, and Oman in a seismology technical working group. This topic is of widespread concern in the area, given its active seismicity and recent damaging earthquakes in Turkey, Greece, India, and Afghanistan.

We are also participating in a number of projects in Central Asia. Some of these projects involve collaboration on radiation detection technologies, with the goal of improving border security in the region to prevent illicit smuggling of nuclear materials. Other projects are characterizing the composition and flow of groundwater and associated contaminants in an attempt to improve the preservation and use of regional water resources. Water—quality and quantity—is an important transboundary issue in Central Asia, affecting decisions related to the transport of oil and natural gas across the Caspian Sea, hydroelectric versus agricultural use of water, and contamination due to Soviet legacy issues.

These collaborations leverage Lawrence Livermore capabilities in seismic monitoring and event analysis, radiation detection technologies, modeling of the flow of water and contaminants in underground aquifers, atmospheric science, biology and genomics, and energy resources. The projects can provide real benefits in, for example, interdicting illicit smuggling associated with weapons of mass destruction and reducing environmental stresses that undermine public health and regional economics. By speaking the common language of science and promoting cooperation on relatively "safe" transboundary issues, these projects can also help to develop indigenous capabilities that improve the regional standard of living, thereby enhancing stability and security in critical areas of the world and, ideally, removing motivations for the acquisition of weapons of mass destruction.

POST-SEPTEMBER 11 SITE SECURITY

Our response to the terrorist attacks on September 11 included swift actions to enhance the security of the laboratory and to reevaluate what additional security measures are appropriate in view of the changed threat. Livermore's Safeguards and Security program is designed to protect special nuclear materials and classified information as well as personnel, property, and the public. A layered approach is used to both physical and cyber security with the amount of protection and the types of access controls provided depending on the relative attractiveness of the asset.

Post-September 11, we quickly took effective steps to provide a more robust site security posture at the laboratory. Livermore now operates routinely at heightened security. Closure of non-essential perimeter gates and roadways near the nuclear materials "Superblock," increased patrols and random searches, additional armed officers at perimeter entry points, 100 percent search of all truck deliveries are among the measures being taken. To meet staffing needs to sustain the posture, we have embarked on an aggressive hiring and training effort. We also continue to improve our cyber security defenses, and the laboratory has received funding to implement several physical security enhancements.

It is important that funding keep pace with the demands for greater security. In the area of cyber security, the threat continues to grow in sophistication while funding levels to implement upgrades remain nearly flat. As for physical security, the laboratory has aggressively pursued technology solutions as a cost-effective alternative to increasing staff. An example is our development and continual improvement over the past 14 years of the Argus system for access control and alarm station management, which is now widely used in the DOE complex to significantly reduce staffing needs. The "Smart Camera" technology that Livermore developed is now being applied at the laboratory, and other NNSA sites are eager to install it. There are numerous other areas where research and develop funding is needed to make technological advances that would reduce staffing requirements and/or provide greater security without increasing workforce size.

One factor that could radically modify workforce requirements and budgets for Safeguards and Security at the laboratory is DOE's policies with regard to protection strategies, the Design Basis Threat (DBT), and the capabilities afforded potential adversaries. The DBT is being reexamined post-September 11.

In addition, Lawrence Livermore and Sandia/California national laboratories are taking steps to deal with a long-standing issue—the physical proximity of East Avenue. The road runs between the two laboratories and both have significant facilities close to it. Controlled access to East Avenue would provide enhanced security for facilities and personnel. We have DOE, political, and public support for moving for-

ward on closure of East Avenue. Alameda County, the City of Livermore, and our neighbors are receptive to the proposal, and we are looking at methods to fast-track the project. NNSA has given the project high priority and is providing funding for a conceptual design.

ENVIRONMENTAL MANAGEMENT AT THE LABORATORY

We are very concerned about the proposed fiscal year 2003 budget for Environmental Management efforts at the laboratory, which constitutes a reduction of about 27 percent from the fiscal year 2002 allocation. The laboratory requires an additional $17.5 million above the budget request to maintain its existing Environmental Management program. Specifically, $8.1 million must be added to maintain the baseline groundwater cleanup program, and $9.4 million must be added for activities to manage newly generated wastes.

Environmental Restoration. Considerable work has been done to remediate soil and groundwater contamination at the laboratory's main site and Site 300 to reduce risks, meet community interests, and satisfy regulatory requirements under Federal Facility Agreements. Both sites are on the Superfund list. The majority of the contamination at the main site occurred during World War II when it was a Naval Air Base. Solvents used to clean airplane engines were spilled on the ground, and they eventually leaked into the groundwater resulting in the current contaminant plumes. Discontinued Laboratory operations also contributed to the contamination, which threatened the drinking water for the nearby City of Livermore. Site 300, located 13 miles from the main site, has been used for high-explosives research and testing. Past operations resulted in the release of hazardous and radioactive materials.

Specific actions such as characterization of suspected contaminated areas, as well as the design, construction, and operation of treatment facilities have been negotiated and agreed to with the regulators and stakeholders in order to accomplish satisfactory cleanup. Unfortunately, shrinking budgets in recent years have made it extremely difficult to maintain the level of progress and to meet all of the set requirements and schedules despite the laboratory's best efforts to accomplish needed work using innovative and cost-effective methods. As a result, regulatory commitments are not being met in as complete and timely a manner as desired, and contamination may continue to spread, increasing the magnitude of the problem and cleanup costs.

With the proposed cuts in the fiscal year 2003 Environmental Restoration budget, Livermore will miss critical cleanup milestones that have been negotiated by DOE with the State of California and the Environmental Protection Agency. Much of the existing groundwater cleanup equipment and operations will be shut down, leaving potentially contaminated areas unevaluated and allowing some areas with known contaminated groundwater plumes to continue to spread unchecked toward farming and residential areas. The amount of sampling, analysis, and regulatory reporting will decrease significantly; and there will be a significant delay in the cleanup of both the main Livermore site and Site 300.

Waste Management. Despite successful efforts over the last 5 years to reduce waste management costs, increases in DOE and regulatory requirements, coupled with yearly budget reductions, have put the laboratory in a difficult position. The proposed reduction for fiscal year 2003 is particularly large—$14.8 million compared to $21.3 million authorized in fiscal year 2002 and $23.7 million required to sustain waste management activities at the laboratory, which must meet State and Federal regulations.

Hazardous waste management has two components to its budget. There is the basic cost of maintaining day-to-day operations and managing wastes of all types in a safe and compliant manner. There is also a proposal to clean up the laboratory's legacy waste. Livermore has over 2,200 cubic meters of legacy mixed, low-level, and transuranic wastes in storage in facilities that should be relocated. Some of this material has been in storage for over 15 years; most of the waste has been stored outside and exposed to effects of weather; and container integrity is a looming issue.

Under the current proposed budget, it will be impossible to meet the laboratory's programmatic needs with a safe, compliant waste management program. This will have severe impacts on the national security mission and will cause certain programmatic activities to be deferred and/or cancelled. In particular, because of Livermore's limited waste management handling capabilities, a number of critical research and development programs that generate RCRA-regulated waste will be put on hold to maintain compliance. In addition, all stored radioactive waste will remain at Livermore because there will not be funding available for disposal off site. Lack

of space will prevent the laboratory's Hazardous Waste Management Department from accepting newly generated radioactive waste. This will shut down critical work on stockpile stewardship. Furthermore, the proposed budget does not include sufficient funding to begin waste management operations in the new $62-million Decontamination and Waste Treatment Facility (DWTF), which features modern and safer technologies. Mixed and radioactive waste that has been stored on site for many years will continue to be stored outdoors instead of in the new facility.

The DOE Environmental Management Cleanup Reform Fund. The laboratory has submitted a proposal to obtain an additional $30 million for accelerated environmental cleanup from the Environmental Management Cleanup Reform fund, which DOE proposes to create as part of the fiscal year 2003 Environmental Management budget. We believe our proposal to be very competitive; however, an award from this fund will not adequately replace the $17.5 million shortfall in funding needed to maintain our existing Environmental Management program. For Livermore to qualify for any of the funds, the State of California will have to renegotiate its compliance agreements, which is one of the requirements.

SUMMARY REMARKS

The Stockpile Stewardship Program continues to make excellent technical progress in many areas, some of which I have highlighted here: notably, the W87 ICBM warhead life extension, completion of the Contained Firing Facility, progress on construction of the National Ignition Facility, the dedication and use of the ASCI White supercomputer, progress on future ASCI plans at Livermore, and numerous scientific and technical achievements that are improving our understanding of the aging of nuclear weapons and weapon performance. However, many difficult challenges lie ahead. There is continuing need for a strongly supported and sustained Stockpile Stewardship Program to maintain the safety, security, and reliability of the Nation's nuclear deterrent over the long term. The NNSA's 5 year plan for Defense Programs reflects the need for a strong program, and I support NNSA's plan and the budget request for fiscal year 2003.

Strong and sustained support is likewise needed for our activities directed at reducing the threat posed by the proliferation and terrorist acquisition of weapons of mass destruction. As I have highlighted, Lawrence Livermore and our sister NNSA Laboratories made unique and important contributions to homeland security post-September 11. We were able to respond so rapidly and effectively because of the technical and operational capabilities we had developed over the past decade and more to deal with the WMD terrorist threat. Although these technologies and systems performed extremely well, surpassing our highest expectations in many cases, still-better capabilities are needed to effectively protect the U.S. homeland from the threat of WMD terrorism. September 11 demonstrated the high level of technical innovation, operational sophistication, and determination of today's terrorists. The challenge we face in defending against such determined adversaries will only grow greater in the years to come. The Nation must make a sustained commitment and long-term investment in the research and development required to create the improved warning, detection, and response capabilities needed tomorrow and in the future.

Post-September 11, we quickly instituted a more robust site security posture at the laboratory. This heightened level of security has become the norm, and we have embarked on an aggressive hiring and training effort to meet staffing needs to sustain this posture. It is important that funding keep pace with demands for heightened security. Funding is also a concern in the area of Environmental Management. The progress we have made in remediating soil and groundwater contamination is in jeopardy with the proposed fiscal year 2003 budget. At the proposed funding level, we will be unable to meet currently negotiated Federal Facility Agreements or to operate a compliant waste management program that meets facility infrastructure needs. It will also be impossible to support Livermore's programmatic needs with a safe, compliant waste management program. This will have severe impacts on the national security mission and will cause certain programmatic activities to be deferred and/or cancelled.

Finally, I wish to express my appreciation again for the support that this committee has provided for the important national security work that Lawrence Livermore performs for the country, during my tenure as director and throughout the laboratory's history. We are celebrating our 50th anniversary this September and looking forward to the next half-century of service to the Nation. Lawrence Livermore National Laboratory has a bright future with your continuing support.

PREPARED STATEMENT BY DENNIS R. RUDDY

Mr. Chairman, I respectfully request that my written testimony be included in the record.

My name is Dennis Ruddy. I am President and General Manager of BWXT Pantex, which manages the National Nuclear Security Administration's Pantex Plant near Amarillo, Texas.

Since BWXT Pantex assumed operations of the plant a little more than a year ago, we have made significant progress in fulfilling the site's important national security missions:

- Evaluate, retrofit, and repair weapons in support of both life extension programs and certification of weapon safety and reliability;
- Dismantle weapons that are surplus to the strategic stockpile;
- Sanitize components from dismantled weapons;
- Develop, test, and fabricate chemical and explosive components; and
- Provide interim storage and surveillance of plutonium components.

BWXT Pantex is preparing to accomplish future work that will provide a safe and reliable nuclear weapons stockpile for many years to come. That preparation involves improving our infrastructure and technology within a new security environment to ensure our ability to meet Stockpile Life Extension Program objectives.

I believe we all recognize the challenge of providing for the security of our facilities and our personnel in the wake of the events of September 11, 2001. Immediately after the tragic events of that day, we implemented a contingency plan to ensure the security of the site and our personnel. Since that time, we have enhanced security in a wide variety of areas. We increased security patrols around the site, tightened our requirements to access the facility, improved our physical security systems and replaced equipment that was beginning to show its age. While our workforce, and particularly our security force, has responded admirably, these enhancements have not come without costs. This fiscal year, more than $16 million in supplemental funding has been given to Pantex to cover these expenses. This amount is over and above the $68 million originally earmarked for Pantex security.

Much of this funding has been used to cover overtime for our security force. Before September 11, our security guards normally worked 12 hours a day, on 4 consecutive days. Then, they had 4 days off. Since September 11, they have worked 6 consecutive 12-hour days, then been given 2 days off. In order to meet the NNSA's new security requirements, reduce our overtime, and put our guards back on a more reasonable work schedule, we established a target to hire 140 additional security officers by the end of this fiscal year. Through operational efficiencies and other security enhancements, we are seeking to reduce this new staffing to 109 additional officers. Either number will be a significant increase in security personnel compared to our staffing before the terrorist attacks. In addition to personnel additions, we are currently considering other security enhancements and their associated costs. In order to develop these security improvements and retain our new personnel, permanent increases in security funding will have to be made a priority.

Despite the increased attention that we have given to security, our mission to support stockpile stewardship remains our primary focus. The Nation still depends on a reliable nuclear deterrent to protect our country and our allies, and BWXT Pantex is committed to safely providing weapons of the highest quality to our customer. As we look ahead, we see that the majority of our weapons dismantlement workload will be complete by 2008. Our weapons evaluation workload remains steady for the foreseeable future. Beginning in 2005, we are planning for a surge in work to support the Stockpile Life Extension Program (SLEP) effort. The additional SLEP workload will involve modifications to nine weapon systems and will bring with it additional evaluation requirements.

Unfortunately, projected budgets in fiscal year 2003 through fiscal year 2007 do not currently correspond with our projected workload. Beginning in fiscal year 2005, we see a $12 million to $16 million per year difference between our budget needs and the NNSA's FYNSP funding targets for weapons work. The FYNSP targets in the Campaigns area are $2 million to $7 million per year less than needed beginning in fiscal year 2003, a shortfall that impacts technology developments necessary to complete SLEP work. However, the largest reductions are seen in the Readiness in Technical Base and Facilities (RTBF) area. Beginning in fiscal year 2004, shortages ranging from $32 million to $42 million each year will severely impact our ability to meet NNSA workload needs.

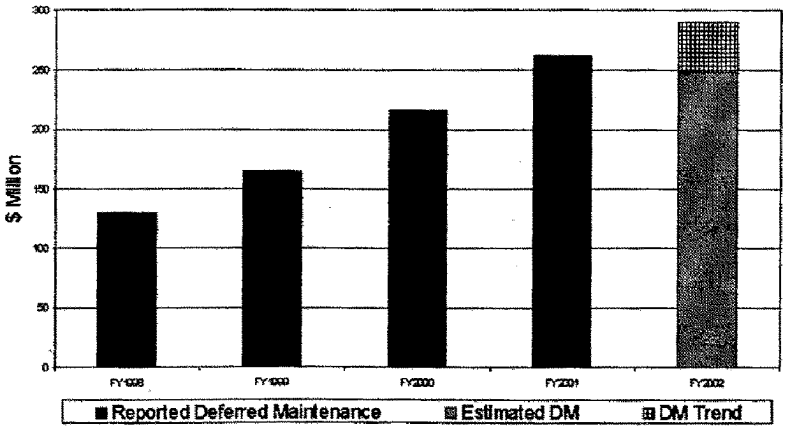
Although much of the budget shortfall is seen in later years, we have particular concern over the effect of Campaigns and RTBF funding in fiscal year 2003 and fiscal year 2004 on SLEP work. The military is depending on SLEP to provide a safe, secure nuclear deterrent for many years to come. We see that reductions in Cam-

paigns and RTBF funding in fiscal year 2003 and fiscal year 2004 will delay or eliminate technological and facility improvements needed to implement the SLEP schedule on time.

As I have testified to this group before, we have significant infrastructure needs at Pantex. I am happy to report that thanks to the increased funding that we have received, we have made progress in improving our infrastructure. The fiscal year 2001 plus-up and supplemental funding of approximately $15 million allowed us to make some roof repairs to prevent leaks in weapons production facilities and replace some aging equipment necessary for our work. In fiscal year 2002, we are receiving $22 million in Facilities and Infrastructure Recapitalization Program (FIRP) funds and a plus-up of at least $20 million. These monies will be carefully used to make additional roof repairs, replace obsolete fire alarm systems, and carry out much-needed maintenance in a wide variety of areas.

Still, there is much to be done. We had a $218 million backlog in infrastructure needs in fiscal year 2000. That number increased to $262 million in fiscal year 2001. The FIRP funds mentioned earlier will allow the fiscal year 2002 infrastructure backlog to decrease to approximately $248 million. (See Figure 1.) As this chart shows, we have turned the corner and are beginning to decrease the deferred maintenance backlog. While we are spending our infrastructure funds on the highest-priority items, the fact remains that more than 50 percent of the plant's square footage is over 25 years old. Many building elements are at the end of their service life and require restoration. We cannot meet the future infrastructure requirements of the Stockpile Stewardship Program without continued expenditures to keep our facilities in the condition necessary for high-quality, safe nuclear weapons work.

Figure 1: Deferred Maintenance Baseline



Another key factor in our ability to support stockpile stewardship in the long term is the recruiting and retention of employees with critical skills. BWXT Pantex has taken a proactive approach to recruiting, retaining, and developing the critical skills necessary to accomplish future weapons work. We have identified the critical skills in engineering, science, and other areas necessary for us to maintain and grow our technical basis for weapons work. Of the 1,174 positions we consider to be critical, we have only 78 vacancies. This is an improvement over the 200 critical skill vacancies we had 1 year ago. In addition to outside hiring, we have initiated two new programs to develop our employees from within. Late last year, BWXT Pantex announced the development of an Engineering Graduate Studies Program in conjunction with Texas Tech University, West Texas A&M University, and the Amarillo Economic Development Corporation. This program is allowing our employees and other workers in the community to earn advanced engineering degrees locally. We also worked with West Texas A&M to develop an Employee MBA program to allow our workers to receive advanced instruction in business. Both of these programs have been very well received by our employees and will provide us with a higher quality workforce in the years to come. As long as our budgets remain stable, we

will be able to offer a working environment that helps attract and retain people with the key skills that we need.

As our workload at Pantex increases, so does the amount of oversight at our plant and other sites around the Complex. While we recognize and agree with the need for independent evaluation of our results, the growing oversight into our processes and activities detracts from the attention we are able to give to the day-to-day work that the NNSA requires of us. In this fiscal year alone, we have already had 25 audits from the Inspector General, DOE/NNSA, General Accounting Office, and the Defense Nuclear Facilities Safety Board. This trend is sharply up from fiscal year 2000 and fiscal year 2001.

Looking to the future, we believe that positive gains will be realized as the reorganization of the NNSA continues. A streamlined path of communication will improve our business and make us more agile in responding to requests. The ability of NNSA to use its resources to better support the sites will increase efficiency. Movement of more decision-making responsibility to the field offices will also lead to more efficient operations. We fully support these changes and look forward to the reorganization being implemented as soon as possible.

As I said at the outset, BWXT Pantex is laying the groundwork for important stockpile stewardship work to extend the life of our nuclear weapons stockpile. Improvements in technology and infrastructure will prepare the site to meet NNSA's Stockpile Life Extension Program goals. In the interim, we will work with NNSA and Congress to address the challenges that we currently face.

Mr. Chairman, thank you for the opportunity to present these views to you today. I look forward to continuing to work with you and the members of this committee to ensure the safety and reliability of the stockpile in the future. I will be happy to answer any questions the subcommittee may have.

PREPARED STATEMENT BY JOHN T. MITCHELL

Mr. Chairman and subcommittee members, thank you for the opportunity to update you on Defense Programs activities at the Y–12 National Security Complex in Oak Ridge and to provide you my views on our near-term and long-term ability to meet the challenges of the Stockpile Management Program. We have made considerable progress at Y–12 over the past year, but still face significant challenges in meeting the expectations of the National Nuclear Security Administration (NNSA) over the long-term.

OVERVIEW

The past year at Y–12 has been one of renewal and change. Many longstanding challenges have been met head-on and significant progress has been made. New management systems and processes have started to take effect and increased effectiveness and control are clearly visible. Our emphasis on Safety and Security as the cornerstones of our operations have resulted in satisfactorily completing both the Integrated Safety Management Phase II review and the security review performed by the NNSA/DOE Office of Assessments this fiscal year. Both in our response to the events of September 11 and the measurement of our safety performance, it is clear that the groundwork laid in 2001 has supported improved execution of these key responsibilities.

Aided by the funding identified through the Facilities and Infrastructure Initiative, we have commenced a long-term plan to consolidate the active functions of Y–12 into a reduced footprint through a balanced program. Our approach includes reducing the occupied building inventory, removing unoccupied buildings from the inventory, reusing major facilities where possible, and the selective investment in recapitalization where long-term efficiencies result.

We have re-energized the planning and execution of an aggressive technology infusion program at Y–12 to both optimize support for the upcoming defined workload and to assure long-term, safe, secure, and efficient modern capabilities to meet the Nation's security needs. We have started the renewal of the dedicated Y–12 workforce through major increases in college-level recruiting, cooperative university programs, and emphasis on increasing the technical and managerial competence level of our workforce. Throughout these focused efforts, we have placed great value on detailed program planning and a project management culture for execution effectiveness. Site-wide integration in resource planning and prioritization has assured a balance in investments and a clear definition of needs versus wants.

INFRASTRUCTURE

BWXT Y–12 has been implementing its strategy for infrastructure improvement—intense planning focused on scientific and manufacturing needs, definition of equipment, facilities and skills, and alignment of technology development. Our goal is to create a consolidated manufacturing footprint, with a central hub of secure operations surrounded by the developmental, technical, and other support functions needed to execute the mission.

Y–12 has begun the process of removing non-essential facilities. This removal will make room for beneficial upgrades to the plant and reduce cost for surveillance, analysis, maintenance, and security. The Facilities and Infrastructure (F&I) Initiative has been pivotal to our demolition efforts, as well as providing critical support for much-needed maintenance and facility repairs.

Y–12 has also begun the first major steps in deploying key investments in the future of Y–12. We are beginning the preliminary design for high enriched uranium materials facility, the next major step in improving the storage of the Nation's inventory of highly enriched uranium. We also have received approval to begin preliminary design of the purification prototype facility, the first element of the Special Materials Capability Program. The architect-engineering contracts are in place for both these projects. In addition, prototype development of a new beryllium manufacturing capability is underway and we are ready to begin conceptual design for a production utilities project.

Following these projects, we need to move forward on plans to consolidate depleted uranium operations, upgrade enriched uranium operations, relocate quality evaluation operations, and upgrade safeguards and security systems by reducing the protected area of the plant. There will also be continued emphasis on use of F&I to make critical facility repairs and to continue the infrastructure reduction activities to consolidate and disposition excess facilities.

Achieving and sustaining infrastructure improvements within the NNSA funding forecasts continues to be a challenge. The cost to operate aging facilities increases as demands for maintenance and capital replacement expand. Sustainable support will be necessary for Y–12 to meet mission requirements while resolving problems caused by years of deterioration at Y–12. The trade-off between operations, maintenance, and capital investments must continue to recognize the long-term interests of Y–12.

TECHNOLOGY

Y–12 has begun two important initiatives over the past year that will improve the way technology is introduced in the plant and its missions. The introduction of new technologies must be managed from a different perspective today than was the historic norm for the production complex. The stockpile stewardship paradigm may well require a higher level of technology for refurbishment than was required for the original build. When a flaw is identified, the resolution of that flaw will be reverse-engineered from test data. The tolerances for that new part can be much more exacting than was originally required. In addition, today's technology introduction may be based on the ability to achieve substantial efficiencies in mission execution. These efficiencies may stem from the introduction of technologies that were not previously available or concepts that were previously discarded based on then-valid mission requirements that are no longer appropriate (e.g., stockpile size).

The first initiative, technology roadmapping, has the goal of modernizing the processes, equipment, and supporting systems (e.g., computing and information management systems). The roadmap would identify the strategies and direction of the technology program. These strategies would be screened against the time to bring them to the shop floor, cradle-to-grave cost estimate, potential for success, and return on investment.

In a second initiative, BWXT–Y12 has begun a technology partnership with the Oak Ridge National Laboratory (ORNL). The technical needs of Y–12 are heavily weighted toward ORNL's R&D agenda (i.e., materials science, modeling/computational science, and instrumentation and control). In these key areas, ORNL provides access to state-of-the-art facilities, leverage for Y–12's development funds, and a pathway to the broader technical community—private industry, the science laboratories, and academia.

The introduction of technology into Y–12 will be critical to the future economical execution of our mission. Again, the trade-off between operations, technology introduction, and capital improvement will require a sustained commitment to the long-term interests of Y–12 and its mission.

MANAGEMENT SYSTEMS

BWXT Y–12 is bringing fiscal discipline to Y–12. We have established a centralized planning function to include estimating, schedule planning, resource budgeting, strategic baseline planning, performance measurement and reporting, and systems management. A common tool-set has been established to provide the planners consistent planning software across the Y–12 site.

Using these tools, we have developed schedules and resource requirements for all work activities, including work breakdown structure (WBS) elements, and the estimated costs, schedule, duration, resource loading, and the required earned value protocols for each element. The 10-year baseline is complete covering all major projects planned at Y–12, including future weapons programs, modernization programs, infrastructure reduction projects, and technology development activities.

Currently, we are focusing on several key upgrades to our process. While standard estimating procedures and formats have been established for all work done across the site, we are working to improve the accuracy of our estimates. Also, we are working to improve our production control systems, including the recent completion of a pilot project. The resulting schedules will provide the required integrated planning for preventative maintenance, operations, inventory, and facility maintenance efforts.

These initiatives provide managers the visibility to effectively manage cost, control scope, and maintain schedule commitments. We are working hard to assure that the resources placed in our care are well spent on activities of highest importance to our mission.

WORKFORCE

Y–12 is taking action to assure the technical base is available to carry out its mission in the future. We have defined our critical skill needs and initiated the hiring of entry level, technical talent to prepare them to be tomorrow's leaders. In order to attract the best talent, we have initiated cooperative education programs, including the establishment of internal mentors to maximize the benefit of their time at Y–12. We are now developing a program of partnerships with universities in the region and preliminary response to the concept of these partnerships has been enthusiastic. Our objective is to assure the best people are attracted to Y–12 as a vibrant workplace whose mission is important to national security.

Safety is the responsibility of all employees and important to everyone. BWXT Y–12 has been working to bring the commitment to safety to be a first principle at Y–12. All supervisors and managers completed safety leadership training followed by rolling safety focus meetings with all employees. The routine employee interaction on safety issues has begun to show improvement in our safety metrics for the plant.

MISSION PERFORMANCE

Y–12 continues to meet the direct needs of the nuclear weapons program with timely delivery of products and execution of a wide variety of supporting activities. Shipments of fuel for the nuclear Navy have been accomplished on time. Planning for the near-term needs has resulted in restarting several needed capabilities as well as the introduction of several new technical capabilities. Y–12 has also participated with ORNL to provide centralized and integrated capabilities critical to the success of our national commitment to non-proliferation. A strong and refocused capability to perform work for the full range of government and commercial customers supportive of base Y–12 mission needs has been initiated in partnership with ORNL. This growing and diversified work mix is vital to the retention of critical capabilities and the development of those required for the future.

SUMMARY

While Y–12 has made major steps forward in the past year, there is still a long road ahead to achieve long-term, sustainable capabilities to meet national security needs with confidence, including management leadership and execution effectiveness. Consistent, balanced funding support for operations, technology introduction, and infrastructure re-capitalization will be required. Consistent, timely, and visible definition of program requirements will be needed as well as commitment to stand behind initiatives and investments until they are completed and have produced the expected results. Y–12 must continue to be fully supported in all areas for it to continue to meet long-term national security needs.

PREPARED STATEMENT OF DAVID S. DOUGLASS

Mr. Chairman, my name is Dave Douglass. I am President of Honeywell Federal Manufacturing & Technologies, which manages the National Nuclear Security Administration's (NNSA) facility in Kansas City, Missouri, and facilities supporting transportation safeguard activities in Albuquerque, New Mexico. The Kansas City Plant today is an active, safe, secure, and reliable facility that serves as one of our country's most unique and valued national security assets. Our diversity of sophisticated, complex, and leading-edge manufacturing capabilities is equaled by few facilities in the country, and the fact that these capabilities are housed under one roof in a secure environment is rivaled by no other manufacturer in the world.

We bring to the nuclear weapons complex and our Nation expertise in science-based manufacturing; supply chain management; e-business systems; sophisticated electronic, mechanical, and rubber and plastics manufacturing; and a consistent reputation as one of the NNSA's highest-rated contractors. The nonnuclear components we produce comprise 85 percent of the parts manufactured within the nuclear weapons complex, as well as 85 percent of the components that constitute a nuclear weapon.

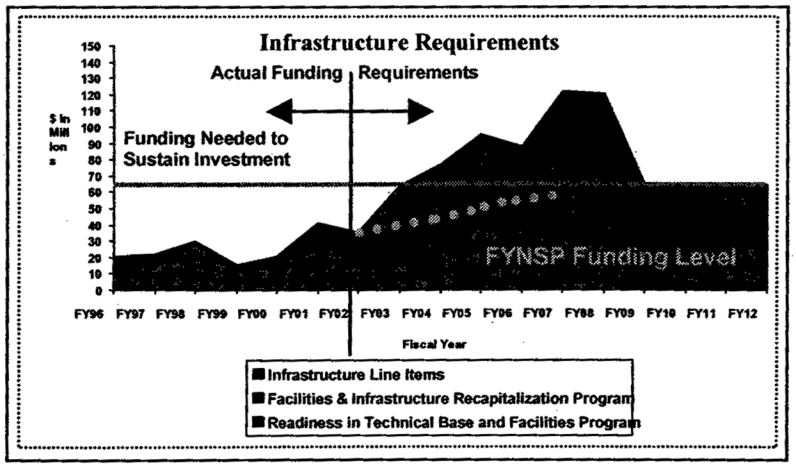
With the help and support of this subcommittee and Congress over the past 4 years, we have begun to address issues impacting our talent pipeline and critical skill needs, infrastructure deficiencies, and recapitalization concerns at the Kansas City Plant. Since last year's testimony, we have used the $12 million in plus-up funding you provided to hire 300 people, keep our critical skills filled at a 99-percent level, and meet urgent infrastructure and recapitalization needs, including equipment upgrades, critical roofing repairs, and renovations to air handling systems in our production areas. In each case, we were able to maximize the dollars we spent by focusing on the highest priorities, however unglamorous they may have been. However, while we may have begun to turn the tide, we have not fixed the problems; and we continue to seek your support in addressing on-going, long-term issues facing the Kansas City Plant.

Mr. Chairman, as both a taxpayer and a contractor, I believe we should be held accountable for the highest standards of performance. This includes driving efficiency improvements throughout our organization. To this end, Honeywell has implemented a number of efficiency improvements at the NNSA's Kansas City Plant that embrace commercial best practices and ensure ever-increasing value for NNSA investments. Honeywell treats Federal Manufacturing and Technologies the same as its commercial businesses, holding us to the same standards of performance. This includes achieving 6 percent year-over-year improvement in productivity, qualifying for and maintaining ISO quality and environmental system certifications, implementing cost-saving digitization applications, achieving safety metrics that are significantly better than national or NNSA standards, and training employees in the use of continuous improvement tools such as Six Sigma. All 2,000 of our salaried associates are Six Sigma Green Belt certified, plus more than 150 of our employees are certified in Six Sigma Black Belt productivity tools. Furthermore, when we were awarded the contract to continue operating the Kansas City Plant in 2000, we committed we would achieve $25 million in efficiency improvements at the Kansas City Plant in the first 2 years of the contract. Last year, our first year, we achieved $20 million. By the end of this year, we fully expect to meet and far exceed the remaining $5 million commitment.

As part of our vision of the Kansas City Plant as a multi-mission, national security asset, we have grown our Work-for-Others program by 42 percent in 2 years. Other government agencies, including military, law enforcement, and intelligence organizations, are finding increasing value in our combination of advanced technology solutions and a high-security environment. Our robust Work-for-Others program helps offset overhead costs and retain critical-skill associates by offering them new technical challenges. This value benefits both the government and the taxpayer.

A natural question is: If we have derived these millions of dollars of efficiency improvements, why do we require sustained funding support? It is well-documented that the Department of Energy made a conscious decision in the 1990s to focus investment on science and defer investment in production. Our efficiency improvements during this decade gave us flexibility to balance near- and long-term needs. Thus, the savings generated by our efficiency improvements were factored into our budget forecasts, allowing us to augment NNSA funding to support infrastructure improvements, critical skill needs, and high-priority programmatic requirements. However, continued investment at 2.4 percent created a substantial backlog of infrastructure needs, compared to an industry standard of 5 percent.

The Kansas City Plant is at a juncture: We are inhibited by funding pressures and modernization issues from achieving the full readiness needed to accomplish our task at hand. We will meet our directed stockpile work obligations, but we will do so at the expense of preparing for the future. Over the next 2 years, our workload will begin to escalate as we prepare for full-scale production for the Stockpile Life Extension Programs. Yet, as the adjacent infrastructure requirements chart indicates, at the same time we gear up for new work, our infrastructure and recapitalization backlog reaches peak levels.



As the chart also indicates, we require $65 million a year to sustain investment in the Kansas City Plant, and limited funding has pushed the backlog into the next 5 years. The additional Facilities & Infrastructure Recapitalization Program funding is significantly helping us lessen the backlog, and I strongly endorse continued support of this important effort.

The Government has a very capable, diverse, experienced, secure manufacturing facility: the Kansas City Plant. It makes good business and economic sense to invest in it and push this national security asset to its highest potential. No other facility is as diverse as the Kansas City Plant. Unlike commercial manufacturers, we are in a position to manage the NNSA's requirements to produce high-quality, low-volume components; retain skills to sustain aging or obsolete technologies; and warehouse parts needed to maintain the 25 year life expectancy of the stockpile—at an affordable cost to the government.

We strongly support General John Gordon in his efforts to simplify and streamline the NNSA and implement a new governance model for management and operating (M&O) contracts. In keeping with the premise behind M&O contracts—to select contractors based on their operational and management experience and provide them with the objectives of what needs to be accomplished—we have taken several steps to simplify and streamline operations at the Kansas City Plant. These steps include introducing commercial industrial standards, including manufacturing, procurement, and human resources best practices. For the new governance initiative to improve performance and reduce costs successfully across the complex, we believe the initiative must radically change M&O operations in four key areas: culture, core processes, performance management, and the government/contractor relationship.

- Culture Change: M&O employees should be treated no differently from employees who work for the contractor at other locations. Contract and other DOE requirements and programs that make the M&O employee a unique employee, and that consequently limit the contractor's ability to rotate in talent from other parts of the corporation, are unnecessary and should be revised or eliminated.
- Core Processes: The NNSA should require contractors to bring robust core processes to M&O operations, particularly in the areas of strategic planning, continuous improvement, leadership development, and performance management. NNSA requirements and practices that dictate the processes to be applied in M&O contracts should be eliminated.

• Performance Management: Core processes should be assessed by independent and knowledgeable third-party sources, and contractors should be judged by the NNSA based on the maturity of their processes rather than isolated and unexpected incidents.

• Government/Contractor Relationship: A partnering relationship should create alignment in business imperatives for NNSA facilities and a clear understanding of roles and responsibilities. We support the concept that it is the role of the Government to identify what needs to be done and the role of contractors to determine how the work should be done, based on the expertise that caused them to be selected in the first place. We envision NNSA personnel working in concert with the contractor to accomplish mission objectives by eliminating barriers to the contractor's tasks, working with stakeholders to resolve community concerns, and working within the Government to ensure program alignment with overall Government needs.

Finally, it is imperative that we maintain balance between science and production. Scientific advancement is vital. We must develop our manufacturing technologies, train our employees, and maintain our facilities. However, it is just as important that the skills and capabilities needed to turn science into reality—real robust products—keep pace with technological advancements. This brings us full circle to the issue of long-term reinvestment in and value of the Kansas City Plant as a national security asset.

Mr. Chairman, you may also ask about the impact of the administration's Nuclear Posture Review, which calls for a reduction in our nuclear stockpile, on the Kansas City Plant. Our volumes will eventually fall, but the need for components will not be diminished. However, the more volumes fall, the less attractive this work will be to commercial industries that must maintain profit margins. These companies cannot afford the overhead needed to sustain aging or obsolete technologies, warehouse parts, or retain expertise in critical skills needed to maintain the 25-year life expectancy of the stockpile. Reinvesting in the Kansas City Plant, and allowing us to defray overheads costs by expanding use of the facility, will address both short-term and long-term nuclear weapons complex needs.

The Kansas City Plant is busy. We support 42 product families and 120 advanced technologies, shipping more than 60,000 product packages annually. We are producing components for every weapons system in the active stockpile. We are hiring new associates and actively addressing critical skill needs. We have begun to increase infrastructure investments to recover from funding shortfalls in the 1990s. We are developing new manufacturing capabilities and suppliers required to support the upcoming Life Extension Programs. The next few years will see significant challenges as we continue to address critical skills, and upgrade our infrastructure while preparing for sizeable new production requirements driven by the Life Extension Programs. Our success is directly tied to a sustained funding profile, which fully accounts for these challenges.

Mr. Chairman, thank you for the opportunity to present these views to you. Honeywell is committed to our national defense mission and to the future success of the Kansas City Plant and nuclear weapons complex. I look forward to continuing to work with you and the members of this subcommittee to address these challenges.

Senator REED. I would like to add that submitting testimony is completely optional. Senator Allard and I would have preferred the opportunity to hear from the contractors in person, but, as I indicated, the committee's schedule this year just does not allow this opportunity.

At $7.1 billion, the EM program is the single largest program at the Department of Energy. Of that amount, $6.4 billion falls within the jurisdiction of this subcommittee. The expenditures and schedules for this program are largely derived from a series of enforceable agreements that the DOE has entered into with the relevant States and the Environmental Protection Agency (EPA).

For the most part, the States and communities that host these DOE sites feel strongly that these agreements protect the health and well-being of the communities and the employees who work there. These agreements have been the driving force to remedy the well-documented history of environmental contamination by DOE and its predecessor agencies. These agreements have in some in-

stances limited the ability of the DOE and the contractors to introduce innovative cleanup approaches and to change how the cleanup is conducted.

On the other hand, the States and the EPA are also interested in having cleanup progress quickly and in the most cost-effective way.

Roughly 12 years of experience with this program has taught that where there is cooperation and a partnership among DOE, the States, and the EPA, progress is made. Faced today with growing cleanup costs, DOE has proposed in the fiscal year 2003 budget a new program called the Cleanup Reform Initiative. The budget request is short on details for this $800 million initiative, but my preliminary understanding is that this account would be available to any site that submits a proposal for accelerated cleanup.

While on its face this appears to be a creative approach to cleanup, it also appears that this account was created by underfunding the baseline cleanup accounts. Thus, the fiscal year 2003 President's budget request will not allow the DOE to meet the requirements contained in all the agreements. Moreover, I understand that to qualify for the funds in this account the States and the EPA have to modify the agreements in ways that may reduce the overall level of cleanup.

The implementation of this new initiative is complicated further by the recent announcement of an agreement with the State of Washington to provide $430 million of the $800 million to the Hanford site. One of the main topics on which I want to focus today, Secretary Roberson, will be the new Cleanup Reform Initiative and the plans to implement it.

Over the past few years, DOE has made substantial progress in cleaning up the contaminated sites, treating and safely storing waste; yet, much remains to be done. Some of the achievements have been possible using new technology. At many of these sites, new or improved technologies will continue to be needed to sustain progress.

The second issue that I want to discuss today is the significant reduction in research and development funds in the fiscal year 2003 budget request. How does this reduction square with the continuing requirement for new technologies? The EM program is a complex and challenging program that will remain a challenge for many years to come. I share your fundamental goal of getting cleanup accomplished sooner and at a reduced cost.

Secretary Roberson, we welcome you to the subcommittee today and note that this is your first opportunity to testify since your confirmation last year. Now I would like to recognize Senator Allard.

Senator.

Senator ALLARD. Welcome, Madam Secretary. Good to have you before the subcommittee. Mr. Chairman, I would like to thank our witnesses for appearing before the Strategic Subcommittee today and providing testimony on some very challenging issues facing the Department of Energy.

Our witnesses today will be speaking about challenges that initially arose out of the Manhattan Project when our Nation's very existence was at stake, almost 60 years ago. World War II led to

the creation of the nuclear weapons program, which required enormous cooperation among many sites and States. In an effort to keep the mission secret, security architects of the Manhattan Project used multiple sites, with each site responsible for its own individual scientific task or weapons components for the larger mission.

The success of the Manhattan Project required intricate planning and enormous cooperation among the various sites and the States where they were located. Now, why am I reflecting on those early days of our Nation's nuclear weapons program? I do so because today we again find ourselves facing enormous challenges. Today we have an aging nuclear weapons complex filled with an aging nuclear weapons work force, both requiring resources and attention to reinvigorate the program. We have inherited environmental challenges from the legacy of our Nation's nuclear weapons program, from a time when we were not as knowledgeable, concerned, or careful.

Cooperation between the sites and their States is still key to maintaining our national security requirements and to meet our environmental responsibilities. Today I am concerned that cooperation between some of the sites and the States where they are located is strained at best and perhaps even broken. Cooperation is being traded in for opportunity, intrigue, and politics.

If we cannot work together across the Department of Energy complex, then each site in each State will find themselves isolated, unable to interact as the complex was designed. No individual site can be successful as its own entity. Each site is dependent on the other sites to make their mission relevant and successful.

There are both benefits and burdens in working with the other sites and States. Some sites have expanding national security and environmental missions for the future. Others are being closed. Their mission has been transferred and it is time to clean them up and move their funding to the remaining sites.

I have worked tirelessly to make sure the Rocky Flats site will be cleaned up and closed as an EM site by 2006. The surrounding communities have worked together and exhibited as great a spirit of cooperation as I have ever seen. They were communities that were at odds on how to proceed, but decided to set aside obstacles and opposition and move forward with focus and determination to get the site cleaned up.

I have worked with the Department of Energy and the site manager to make sure they had everything they needed to make this job move forward. They have been extremely dedicated to this mission. I worked with other members of this subcommittee, including Chairman Reed, the Senate, and the House to try to make the process work instead of getting bogged down in bureaucratic gridlock. I have worked with the State of Colorado and other Federal agencies, including the EPA and the Department of the Interior, to make sure the 2006 date would be kept on track.

Remember, in 1995 the Rocky Flats site had a baseline for closure of 70 years, costing over $30 billion. We are now trying to reduce that to 10 years and $7 billion. The workers at that site have been tremendous. Just last week I was at a Rocky Flats meeting with the union membership, and I can tell you that I have never

been prouder of a group of workers. They are making history, and we should provide these union members the tools and opportunity to succeed. Their dedication and determination has been absolute.

Although we do not have a future mission at Rocky Flats, completing the cleanup is important for the rest of the complex for several reasons. First, it is the responsibility of the Federal Government to return that land to the people of Colorado in an environmentally safe and desirable manner. The site will be designated a national wildlife refuge once the cleanup is completed.

Second, we have agreements with Russia to reduce the amount of weapons-grade plutonium in both of our stockpiles in an effort to promote international nonproliferation goals.

Third, the more than $650 million that goes to Rocky Flats each year for cleanup will become available upon closure to fund ongoing and future missions at the other sites. Rocky Flats costs $1 million a day just to turn on the lights, and I am not sure they ever do shut off all the lights. So it is easy to see why it is important to close this site, which has no future mission.

Finally, it is important to demonstrate to the Nation and the world that such a cleanup is possible and attainable.

Mr. Chairman and this subcommittee, I regret to inform you, that today the closure of Rocky Flats is at risk. Instead of following the proud vision and model of the Manhattan Project, the Governor of South Carolina has decided to play politics. As a result of his dangerous gamesmanship, our Nation's security and our Nation's environmental security have been placed at risk.

Specifically, the Governor of South Carolina has effectively closed his State's borders to shipments of nuclear materials, and by doing so, threatens to bring our nuclear weapons program, our EM program, and perhaps our nuclear nonproliferation program to a screeching halt. How short-sighted these actions are. It is not just Rocky Flats that is directly impacted. By design, all of the sites are interconnected and interrelated. Beyond the direct impacts caused by one State's action, there is a domino effect in which the other States may follow suit and thereby threaten both the nuclear weapons program and the EM program.

For almost a year, the administration has been trying to work with South Carolina to keep a strong future mission for the Savannah River Site (SRS) while also cleaning up the EM facilities. I believe in the mission being conducted at Savannah River. There currently is a new tritium extraction facility (TEF) under construction. A new mixed-oxide plutonium (MOX) facility is being designed. Several other waste processors and storage facilities are either in the design phase or the construction phase. The work force at the site is doing a great job in conducting the mission.

However, the commitment by the State of South Carolina does beg a question for this committee: Why are we spending or considering spending so much money on projects in South Carolina, including processes which require the shipment of nuclear materials into South Carolina, if the border has been closed to such shipments?

I will not even begin to get into the amount of nuclear material and waste currently in South Carolina that is already designated to be shipped out of that State. The Governor is picking and choos-

ing which materials can come into South Carolina and which ones cannot, and he demands that material already there be shipped to other States. He wants a guarantee unlike that which has been given to any other State, that any waste that comes into South Carolina in the future will leave South Carolina, and it is my understanding DOE has offered such an agreement.

In fact, the Governor has been offered both a legislative guarantee and a guarantee in the form of a record of decision. Either approach would be enforceable by the State. But every time the Department of Energy met a demand, another one would appear, pushing the threshold even higher.

I am very sympathetic to the State's situation, but through negotiations we must produce results. Compromise is a two-way street. Up until now, I have tried to be patient, waiting and watching as DOE kept offering more and more to the Governor's increasing demands. Today, Mr. Chairman, my patience is gone. When a State unilaterally shuts their borders, they should be aware that their borders can be shut down in both directions. Perhaps they can for a time keep materials from coming into their State, but also can find materials no longer have a path out, either. If other States in turn shut down their respective borders, our national security environmental responsibilities may hang in the balance.

Thank you, Mr. Chairman.

Senator REED. Thank you very much, Senator Allard.

Senator Inhofe, do you have an opening statement?

Senator INHOFE. I do not have an opening statement, Mr. Chairman, but I have a great deal of concern. I served as Chairman of the Readiness and Management Support Subcommittee for 4 years. One of the problems we have is the cost of cleanup, the cost of compliance with environmental regulations. It is my understanding that the administration has been working on legislation that might address this in that they might exempt some installations from some of the EPA regulations.

I wanted to just mention that to you now in case you are not familiar with the status of that. Maybe one of your staff people could find out before the question and answer period, because that is something I think is very critical, very significant to our state of readiness, and I want to ask that question.

Thank you, Mr. Chairman.

Senator REED. Thank you, Senator Inhofe.

Madam Secretary, your statement is a part of the record. You may proceed to summarize your statement.

STATEMENT OF HON. JESSIE HILL ROBERSON, ASSISTANT SECRETARY OF ENERGY FOR ENVIRONMENTAL MANAGEMENT

Ms. ROBERSON. Thank you, sir. Thank you, Chairman Reed, Senator Allard, Senator Inhofe, and other subcommittee members that may arrive.

I am here today to ask for your support for the Department's efforts to reform the Environmental Management program. I am pleased to report to you that the transformation of the Environmental Management program has begun. DOE has already taken the first steps to change our focus from risk management to risk

reduction and elimination, to shift our focus from process to product, and to instill in this program the kind of urgency necessary to clean up and close the nuclear legacy of the Cold War to protect and secure the homeland.

We have already taken several steps to immediately implement proposals for reforming and revitalizing this program. We have developed special teams and deployed those teams to most of our sites in combination with our field elements, our contractors, State and Federal regulators. We have also involved other stakeholders in the communities around those sites to develop accelerated cleanup plans.

We have taken actions to further augment the Nation's security through the consolidation of nuclear material at EM sites, a key recommendation of the Top-To-Bottom Review of the Environmental Management program. We are working in partnership with the National Nuclear Security Administration to ensure that our nuclear material is safe and secure. This accelerated effort will lead to more secure protection of our nuclear material inventory while reducing the cost of storage and protection at multiple sites.

DOE has also taken the initial steps to align our internal processes and management to enable a streamlined, more focused approach to cleanup. EM has begun reviewing our contracts to ensure that they are effectively meeting our cleanup and closure needs. We have also begun reviewing existing systems and, where necessary, developing new systems for managing our contracts to ensure effective government oversight.

The progress we have made so far is very significant. It would not have been possible without the active support of the members of this subcommittee. I appreciate your support and your confidence.

As far as we may have come to date, the unfinished work ahead of us is great. Most of the hardest work and the toughest challenges are still before us. The EM budget request for fiscal year 2003 contains key initiatives and tools we need to help us continue the work of reforming this program. Our budget request for $6.7 billion is about the same amount as appropriated last year. However, if we can achieve agreements for accelerated closure at our sites around the complex, we are prepared to amend our request consistent with the funding needs of those agreements.

Our fiscal year 2003 request has two components, a base budget of $5.9 billion and a new cleanup reform account. This new account is proposed specifically to fund projects and activities at sites that achieve agreements with their States to enable accelerated cleanup and closure.

More details of our fiscal year 2003 request are contained in my formal statement, so I will not go over those. I recognize that there have been many questions, many that you cited in your opening comments, that have been raised about this new cleanup reform account: How will it be allocated? What criteria will be used? What happens if DOE cannot propose a specific site allocation after the markup?

I want to make several broad points at the outset. First, this account is critical to the success of our efforts. Second, it is our intent to look for more efficient and effective ways of achieving cleanup

and risk reduction in the base budget of $5.9 billion, thus to demonstrate more visible and tangible results for the entire budget request.

Third, it is not our intent to get out of compliance with any of our regulatory agreements. This is not an assault on our cleanup agreements. These agreements are living documents with processes to enable improvements and revisions to achieve our mutual goals.

Fourth, DOE is looking not only to States, but even more so to ourselves. We cannot achieve the results we want unless we address our own business practices.

Fifth, DOE is not seeking any new authority from Congress at this time to achieve our accelerated objectives. We believe we have adequate authority within the current statutory framework. If in the future we believe we need new authority from Congress to carry out reforms of this program, we will inform Congress at the appropriate time.

Members of this panel have appropriately demanded more of DOE, more accountability, more fiscal responsibility, more tangible results. We are strongly aligned with your efforts to improve our work. The fiscal year 2003 budget request is based on a simple premise: that Congress, the States, and the communities that host DOE sites all want accelerated risk reduction and cleanup. This budget request will put into place a valuable set of tools and instruments we need to achieve this mutual goal.

I do not come before you claiming that we have all the answers. In many respects, this is possible because of the work of those who have come before us. Nonetheless, we feel a sense of urgency that requires that we forge ahead in spite of the uncertainties. I am confident that we can, working together, be successful.

Thank you.

[The prepared statement of Ms. Roberson follows:]

PREPARED STATEMENT BY JESSIE H. ROBERSON

Mr. Chairman and members of the subcommittee, I appreciate this opportunity to appear before you to discuss the Department of Energy's Environmental Management (EM) program and its fiscal year 2003 budget request.

We meet today at an historic moment for the Environmental Management program. This is no ordinary year. This budget request does not come at an ordinary time. This administration has just completed a comprehensive review of EM and has concluded that this program is badly in need of repair. For 10 years we have spent tens of billions of dollars but have failed to make commensurate progress towards cleanup and risk reduction. If present trends continue unchecked, we will squander taxpayer money and make only minimal progress towards cleanup and risk reduction. This is unacceptable. This administration is determined to make changes.

This budget represents the first step towards addressing the fundamental problems facing EM. DOE has analyzed what is wrong and has taken the first steps forward. To go further, we need the help and support of Congress. We need the help and support of States and our State and Federal regulators. We need the help and support of stakeholders and communities throughout America. We can turn this program around and produce real progress towards cleanup, but only if we all work together towards our common goals.

The Department is requesting $6.714 billion for the EM program for fiscal year 2003. This is approximately the same level as Congress appropriated for the program in fiscal year 2002. In a year when demands for Federal dollars are particularly high, this request demonstrates the administration's commitment to cleaning up the contamination resulting from Cold War nuclear weapons production and to ensuring that our surplus nuclear materials are safe and secure to protect the homeland.

The budget request before you begins to fundamentally change the way the cleanup is carried out. We have proposed structural changes in our request to enable us to begin these badly needed changes. The request provides "base funding" to ensure safety and security, and to support on-going cleanup activities at the sites. But it also includes a new and separate $800 million EM cleanup reform account. These funds will be made available to those sites that can in partnership with their regulators, their contractors, and their communities change their way of doing business to provide more tangible progress towards cleanup and risk reduction. If the vast majority of sites agree to the reforms we think are necessary, it is possible that the $800 million may become over-subscribed. In this event, the administration is prepared to support additional resources to complete reforms at remaining sites.

The reforms proposed in the fiscal year 2003 budget request do not fully meet my own or the Secretary's expectations of an effective and revitalized EM program. Rather, it is a transitional budget. It contains some elements of the changes we plan to put in place, but it is really only a first step in the transition toward a more risk-based and efficient cleanup program. Therefore, in my testimony, I would like to take a step back from the details of the request to discuss the current circumstances of the EM program, the conclusions of the recently completed program review, and key elements of my implementation strategy. I will then address the priorities used to formulate the fiscal year 2003 request and provide highlights of the critical work we plan to accomplish in fiscal year 2003.

LAYING THE GROUNDWORK FOR FUNDAMENTAL CHANGE—THE CHALLENGE BEFORE US

The EM program is responsible for cleaning up the environmental legacy of the Nation's nuclear weapons program and government-sponsored nuclear energy research. The cleanup program is one of the largest and most diverse and technically complex environmental cleanup programs in the world. Responsible for the cleanup of 114 sites across the country, the EM program faces the challenge of:

- safely dispositioning large volumes of nuclear wastes, including over 340,000 cubic meters of high-level waste stored at the Hanford, Idaho, West Valley and Savannah River sites;
- safeguarding materials that could be used in nuclear weapons, including over 2,000 tons of intensely radioactive spent nuclear fuel, some of which is corroding, and more than 18 metric tons of weapons-usable plutonium;
- deactivating and decommissioning several thousand contaminated facilities no longer needed to support the Department's mission; and
- remediating extensive surface and groundwater contamination.

The painful truth is that EM has not effectively managed this daunting task. Ironically, EM's own indicators would say we are doing well. We have met over 90 percent of our regulatory milestones, and our contractors routinely receive over 90 percent of their available fee. In large part, however, we are measuring process, not progress. This must change.

To illustrate the magnitude of the challenge, EM's own internal estimates of what it will cost to complete cleanup continue to grow. EM's most recent life-cycle cost estimate, based on current plans, is $220 billion, an estimate that could easily increase to more than $300 billion without breakthrough changes in the program. Additionally, only about one-third of the EM program budget today is going toward actual cleanup and risk reduction work. The remainder is spent on maintenance, fixed costs, and other activities required to support safety and security.

The schedule estimates from just a few years ago have also proven to be overly optimistic. Over just the past few years, the estimated closure or cleanup completion dates have slipped for numerous sites. Moreover, the three largest sites—Savannah River, Idaho National Engineering and Environmental Laboratory, and Hanford—have such long-term completion dates (2038, 2050, and 2070, respectively) that the estimates for cost and schedule are highly uncertain and subject to change.

While most of the risks at these contaminated sites do not pose an imminent threat to public health and the environment, the complacency and inaction of the status quo will eventually have startling consequences. DOE spends billions of dollars each year simply to keep these materials safe and secure. Each year we do not move aggressively to reduce and remove these risks, they become costlier to manage and maintain. On the present course, we face the real possibility that we will never meet our cleanup and closure goals.

While these outcomes are not acceptable, they are also not inevitable. This administration believes firmly that reform of the complex is possible, as well as urgent. We have seen examples even under the current approach where an accelerated risk-based approach has yielded concrete results that have served the public interest in cleanup and closure. At Rocky Flats in Colorado, a risk-based management ap-

proach, effective contracting strategies, and an overall sense of urgency have produced real progress towards cleanup and closure. This site has worked hard and struggled to be at the point it is today. That same effort is needed throughout the DOE complex.

I believe with appropriate management and with your support, we can replicate these successes throughout the Nation.

CONCLUSIONS OF THE TOP-TO-BOTTOM REVIEW

Last year, the Secretary of Energy told Congress that the status quo in the EM cleanup program was unacceptable. He directed me to conduct a comprehensive review of the cleanup program with the goal of quickly improving performance. The team I formed to conduct the review concluded that there are numerous structural and institutional problems that are driving EM's poor performance. The report also included several specific calls to action to remedy this situation. In the broadest sense, the report urged that the EM program transform its mission from managing risk to reducing and eliminating risk. The report was issued on February 4, 2002. I am moving out aggressively to evaluate and act on the recommendations of this report and work with Congress, the States, and stakeholders to develop mutually acceptable approaches.

The recommendations, and the problems they address, generally fall into four areas:

1. *Improve DOE's Contract Strategy and Management.* The issue here is both our overall contracting strategy and how we manage contracts. The report concludes that EM's contracting approach is not always focused on accelerating risk reduction and applying innovative approaches to doing work. Effective contracting practices are essential to improve program performance. The EM review concluded that the processes for contract acquisition, establishment of performance goals, funding allocation, and government oversight are managed as separate, informally related activities rather than as an integrated corporate business process. This results in performance standards that are inconsistently and ineffectively applied. The report recommends that EM:

- Improve the quality of the contract solicitation process to attract broader contractor participation.
- Require clarity in contracts with respect to work scope, regulatory requirements, and end points.
- Clearly identify the nature and extent of uncertainty and risks, and align the type of contract accordingly.
- Increase emphasis on real risk reduction by focusing fees on end points rather than intermediate milestones.
- Eliminate the use of subjective performance measures.

The report recommends that DOE undertake a review of all existing contracts for their alignment with these principles and revise or amend those contracts to improve this alignment. Our point here is not to criticize or penalize contractors. Obviously, they did what DOE asked for. But I do not believe that we asked for the right things, and we did not create contract vehicles that pushed them to perform. We must begin implementing more aggressive contracts—ones that genuinely challenge them to achieve and to shoulder more risk—while providing significant profit for truly outstanding performance. But, conversely, it means that mediocrity will reap no rewards.

2. *Move EM to an Accelerated, Risk-Based Cleanup Strategy.* EM's cleanup strategy is not based on a comprehensive, coherent, technically-supported risk prioritization. The framework, and in some cases, the interpretation of DOE orders and requirements, environmental laws, regulations, and agreements have resulted in the diversion of resources to lower-risk activities and over-emphasis on process. To move towards a more risk-based approach:

- Cleanup work should be prioritized to achieve the greatest risk reduction at an accelerated rate.
- Realistic approaches to cleanup should be based on technical risk evaluation, anticipated future land uses, points of compliance, and points of evaluation.
- Cleanup agreements should be assessed for their contribution to reducing risk to workers, the public, and the environment.

The report recommends that DOE initiate an effort to review current DOE orders and requirements as well as regulatory agreements, and commence discussions with States and other regulators with a view to achieving regulatory agreements that accelerate risk reduction based on technical risk evaluation. The issue here is not to

avoid compliance with regulatory agreements. The issue here is that we need to work with States and regulators to ensure that these agreements truly match up with a risk-based approach. We are determined to begin this effort now.

3. *Align DOE's Internal Processes to Support an Accelerated, Risk-Based Cleanup Approach.* The review concluded that EM's internal business processes are not structured to support accelerated risk reduction or to address its current challenge of uncontrolled cost and schedule growth. We must instill a sense of urgency in the system. If we are to accelerate the cleanup and reduce risk, we must transform EM's processes and operations to reflect this urgency and time sensitivity. Some specific actions include:

- Improve work planning to increase the up-front understanding and planning of work and apply project management principles to all core work areas.
- Expand the application of Integrated Safety Management (ISM) to higher-level work planning, where decisions are made about what work is appropriate and desirable and breakthrough safety improvements may occur.
- Develop "lessons learned" at a corporate level to provide a frank description of significant project issues, with corporate lessons learned required for all EM managers.
- Apply DOE requirements in a manner consistent with the work at hand, clarifying requirements relevant to cleanup and streamlining the process for interpreting DOE orders and requirements for more complex cleanup projects.
- Accelerate the closure of small sites. With relatively little additional investment, the risks at remaining small sites can be eliminated sooner, and the life-cycle costs reduced.

4. *Realign the EM Program so its Scope is Consistent with an Accelerated, Risk-based Cleanup and Closure Mission.* The current scope of the EM program includes activities that are not focused on or supportive of an accelerated, risk-based cleanup and closure mission. EM should redeploy, streamline, or cease activities not appropriate for accelerated cleanup and closure. Specifically, EM should:

- Accelerate the consolidation of activities that require safeguards and security infrastructure to enhance safety and security, reduce threats, reduce risk, and save money.
- Refocus the EM technology program to directly address the specific, near-term applied technology needs for cleanup and closure.
- Eliminate or transfer from EM those activities not directly supporting an accelerated, risk-based cleanup and closure program.

MAKING CHANGES ON A FAST TRACK

The review identified specific issues and recommendations that will allow us to move aggressively to change the EM program's approach to its cleanup and closure mandate. Similarly, the sites have contributed their own site-specific strategies and proposals to refocus and accelerate their efforts. All the recommended changes are designed to focus the program on one primary result—reducing risk to public health, workers, and the environment on an accelerated basis.

We have already instituted some changes, and will continue to take action as soon as possible and practicable to bring about the changes that are needed. We have deployed special teams to most of our sites to work with DOE, our contractors, State and Federal regulators, and other stakeholders to develop revised cleanup plans. I am very pleased that we signed a letter of intent with the Hanford site in Washington that will enable us to significantly accelerate our work there and achieve more risk reduction. We are engaged in similar discussions at the Savannah River, Oak Ridge, and Brookhaven sites, and I expect to achieve similar results at these sites over the next few months.

Additionally, we are already acting to ensure our contracts align with and support our accelerated cleanup mission. We recently announced that a new contract will be competed and awarded for cleanup of the Mound Site in Ohio. The new contract, streamlined and focused on reducing risk, will emphasize completing cleanup safely and more quickly, with a goal of transferring the site to the community by 2006 or earlier.

Similarly, as the review makes clear, EM needs to get its own house in order to ensure its internal processes and policies support the urgency of its mission. As part of our human capital strategy, we have just completed a reassignment of 40 percent of the program's 70 Senior Executives in order to strengthen, streamline, and remove unnecessary layers from the leadership of the program. Our purpose is to better leverage the unique talents of these executives, force better integration between

the field and headquarters on the challenges confronting the program, and to stimulate new thinking and creative solutions to the cleanup.

We are taking actions to further augment the Nation's security through the consolidation of nuclear material at EM sites, a key recommendation of the top-to-bottom report. We are working in partnership with the National Nuclear Security Administration to ensure that our nuclear material is safe and secure. This accelerated effort will lead to more secure protection of our nuclear material inventory while reducing the expensive cost of storage and protection at multiple sites.

This is just a beginning. We will continue to work quickly to implement the recommendations of the top-to-bottom report.

THE FISCAL YEAR 2003 BUDGET REQUEST

A key element for implementing the review's recommendations is to ensure that the program's funding is properly aligned to support needed change. The fiscal year 2003 budget request is a first step towards achieving that alignment. It incorporates some new ways of doing business and includes a significant structural change designed to foster agreement on expedited, more risk-based cleanup approaches.

EM's fiscal year 2003 budget request of $6.7 billion is essentially the same level as appropriated for fiscal year 2002. The budget request is composed of two parts: a base budget request and a new Environmental Management Cleanup Reform Appropriation request of $800 million to implement fundamental changes to the cleanup program.

CLEANUP REFORM APPROPRIATION

EM is requesting a new Cleanup Reform Appropriation that is critical to beginning implementation of the recommendations of the top-to-bottom review. While the overall size of the request is consistent with past years, DOE is requesting from Congress new discretion in allocating this money among the sites, and for specific projects within sites. We believe that this approach is essential to meeting the common goal of States, taxpayers, and DOE accelerated cleanup and risk reduction. DOE realizes that we are asking a great deal from Congress with this request, and we are eager to work with you to accomplish this goal.

The Cleanup Reform Appropriation would in essence be a performance tool—a pool of funds available to those sites that both demonstrate their ability to realign to a more accelerated risk-based approach, and provide to DOE specific proposals consistent with this new approach that achieve greater risk reduction, faster.

We are now in the midst of reassessing and realigning our activities to enable a more risk-based, accelerated cleanup approach. It is our goal to develop agreements at each site on a specific set of changes and commitments by all parties that will reflect this new approach. I have no doubt that this process may often be difficult. Everyone will have to let go of certain things they favor in the broader public interest of achieving more risk reduction faster. Indeed, the top-to-bottom review concluded that every player in the cleanup business needs to make changes to enable a more effective cleanup strategy.

Once these strategic agreements are reached, we will develop specific plans that implement this new approach. These plans should be supported by the State and Federal regulators, should align with a revised contract and regulatory strategy, and should reflect a risk-based accelerated approach. These plans might be new projects not previously in the sites' baselines. They might be modified, accelerated versions of existing projects. I am also open to supporting projects that already reflect an accelerated risk-based approach, but where additional funds can achieve even greater risk reduction at a lower life-cycle cost. Each project proposed for the cleanup fund would have a new cost savings and funding profile. Funds from the Cleanup Reform Appropriation would then be made available to fund or supplement existing funding from the base budget for the project. The appropriate congressional committees will be informed of the agreement and the commitment of funds from this appropriation. The funds identified with the acceleration will be merged with the funds in the parent appropriation (e.g., Closure, Site/Project Completion, Post-2006) of the old activity.

This new appropriation will provide the stimulus necessary to encourage our sites, our contractors, DOE headquarters and program elements, and State and Federal regulators to quickly forge agreements to enable more effective cleanup approaches. An example of the candidate projects identified during the review for alternate strategies that should produce results quicker and with substantial life-cycle savings are high-level waste vitrification projects. The review identified alternative approaches to treating high-level waste that would limit vitrification to the high-risk component and pursue alternative treatment approaches for lower-risk components.

These alternative approaches offer the potential of earlier true risk reduction and could save the taxpayers tens of billions of dollars.

In summary, this Cleanup Reform Appropriation provides EM with the tool we need to jump-start our reform agenda. It enables DOE, Congress, communities, regulators, and contractors to work together to achieve our common goal of accelerated cleanup and risk reduction. It also maintains for Congress the necessary oversight and checks and balances to ensure that this fund is managed prudently, and consistently with our common goals.

BASE BUDGET REQUEST

The base budget request would protect our workers, the public, and the environment while continuing cleanup progress across the DOE complex. As I said earlier, this fiscal year 2003 budget is a transitional budget. It does not fully reflect the changes we have proposed and will be implementing throughout the DOE complex over the next several months. The progress towards cleanup and risk reduction reflected in this request does not meet either my, or the Secretary's, expectations for this program. But it does provide us with the set of tools we need to begin the process of improving EM's performance. In building the request, the Department applied the following principles and priorities:

Protect human health and the environment: The budget request continues to place the highest priority on protecting the health and safety of workers and the public at all DOE sites. We expect outstanding safety performance as a matter of course. We demand this from our contractors and ourselves, and we will accept nothing less.

Surveillance and maintenance: Surveillance, maintenance, and support activities needed to maintain waste, materials, facilities, and sites in a safe and stable condition are fully funded in the base budget. This funding maintains the sites in an operating and safe condition. Examples of these types of activities in the request include:

- Safe storage, configuration, and accountability of nuclear materials and spent nuclear fuel at sites such as the Idaho National Engineering and Environmental Laboratory (INEEL), the Savannah River Site in South Carolina, and the Hanford Site in Washington;
- Safe storage of high-level, mixed, and low-level waste, as well as management and disposal of hazardous and sanitary waste, across the DOE complex, including tank safety activities at the Hanford, INEEL, and Savannah River high-level waste tank farms;
- Long-term stewardship at more than 35 sites where cleanup has been completed but where some contaminants still remain. In fiscal year 2003, this will include Weldon Spring in Missouri, which is expected to complete cleanup and transition to long-term stewardship by the end of fiscal year 2002;
- Maintaining the Portsmouth Gaseous Diffusion Plant in Ohio in cold standby, including uranium deposit removal;
- Surveillance and maintenance of more than 62,000 depleted uranium hexafloride and other uranium cylinders located at gaseous diffusion plants in Kentucky, Ohio, and Tennessee;
- Surveillance and maintenance of facilities, including excess contaminated facilities pending deactivation and decontamination;
- Groundwater monitoring and continued operation of treatment systems; and
- Essential landlord functions.

Safeguards and security: This is first EM budget request since the events of September 11. Our Nation is more aware than ever before of the critical need to maintain vigilance in our domestic security and to protect against terrorism. The EM program is responsible for many tons of surplus nuclear material. The budget request provides funding at approximately the fiscal year 2002 appropriation, reflecting both increased and decreased safeguards and security needs. In particular, reduced requirements in Environmental Management Defense Facilities Closure Projects are commensurate with the planned removal of special nuclear materials from Fernald and Rocky Flats sites, and reflect completion of security upgrades in Miamisburg this year.

Accelerated cleanup and closure of Rocky Flats, Fernald, and Mound: The request supports the work necessary to continue accelerated cleanup and closure of the Rocky Flats Environmental Technology Site in Colorado. The request maintains a focus on closure of the Fernald Environmental Management Project and the Mound Site in Ohio. Closing these sites will eliminate significant risk and financial liabilities that EM cannot afford to maintain. Our base budget request also funds sup-

porting activities at sites such as the Savannah River Site and Oak Ridge in Tennessee that are critical to achieving closure of these three major sites.

At Rocky Flats, the fiscal year 2003 request keeps the site on track for closing in 2006. In fiscal year 2003, it supports:

- Eliminating the Security Protected Area. In fiscal year 2001, special nuclear material was consolidated into a single building, significantly reducing the size of the Protected Area. This both reduced security costs for the buildings being dismantled and improved productivity by reducing the time it takes work crews to gain access to these facilities. In fiscal year 2003, based on the current estimates for shipping nuclear material off-site, we will be able to eliminate the Protected Area entirely. Cost savings can than be shifted to active cleanup, rather than maintaining costly safeguards and security measures;
- Shipping 3,700 cubic meters of transuranic waste to WIPP, and 35,000 cubic meters of low-level waste and 3,600 cubic meters of low-level mixed waste for disposal, subject to receiver site availability;
- Completing shipments of plutonium metals and oxides off-site; and
- Continuing deactivation and decontamination (D&D) activities for Buildings 371, 707, 771, and 776/7, and associated remediation work.

At Fernald, the fiscal year 2003 request supports:

- Continuing remediation of the silos;
- Shipping about 93,500 cubic meters of waste to a permitted off-site commercial disposal facility; continuing packaging and on- or off-site disposition of mixed and low-level wastes; and placing 43,000 cubic meters of remediation waste in the on-site disposal facility; and
- Continuing D&D of the Pilot Plant Complex and Multicomplex, and initiating D&D of the Liquid Storage Complex.

At Miamisburg (Mound), we will continue efforts to cleanup contamination and transfer land to the community for economic development. We have already transferred 121 acres, or about 40 percent of the site, for this purpose. The fiscal year 2003 request supports:

- Continuing acceleration of site cleanup and transfer of site properties by completing "critical path" deactivation and decontamination activities in the Main Hill Tritium facilities (i.e., R, SW, and T Buildings);
- Completing site preparations and beginning excavation of thorium- and polonium-contaminated soil (i.e., Release Site 66), the largest contaminated soil excavation project at Mound; and
- Shipping over 19,000 cubic meters of contaminated soil and debris for off-site disposal.

Increased shipments to the Waste Isolation Pilot Plant (WIPP): The request maintains support for a significantly increased rate of shipments of transuranic waste to WIPP. The WIPP facility in New Mexico is critical to EM closure and completion goals at other sites. For example, WIPP is critical to the Department's commitment to the State of Idaho to ship 3,100 cubic meters of transuranic waste out of the State by December 2002, and to meeting the schedule for closure of Rocky Flats. In fiscal year 2002, the Department provided an additional $12 million to WIPP to increase by almost 50 percent the rate of shipments. The fiscal year 2003 request supports:

- Continued increased shipments of contact-handled transuranic waste; and
- Continued progress toward beginning shipments of remote-handled waste, including submission of regulatory documentation to the New Mexico and EPA regulators and facility upgrades and modifications needed for remote-handled disposal operations.

Continuing progress: EM will continue to make progress in completing cleanup projects in accordance with existing approaches and under existing agreements. The Department will continue efforts to clean up release sites; to treat, store, and dispose of hazardous and radioactive waste; and to decontaminate and decommission facilities at many sites. However, we expect to accelerate the pace of progress of many of these projects as we begin to implement the top-to-bottom review recommendations. For example, the request provides funding to:

- At the Hanford site, continue construction of the Waste Treatment Plant to vitrify high-level waste. By the end of fiscal year 2002, we will have begun construction of two of three major facilities, and completed 50 percent of the engineering and design for all three. Work in fiscal year 2003 will focus on continuing construction of the vitrification facility, starting

construction of the pretreatment facility, and purchasing major equipment, as well as designing the feed delivery system.

• At INEEL, begin operation of the Advanced Mixed Waste Treatment Facility, treat about 1,625 cubic meters of transuranic waste, and complete construction and begin operation of the CERCLA disposal facility for remediation waste, as well as continue operations to move spent nuclear fuel to safer storage.

• At the Savannah River Site, continue stabilization of high-risk nuclear material solutions in the canyons; continue activities to suspend and deactivate F-Canyon; complete construction work to stabilize and package plutonium for long-term storage, and the transfer of americium/curium solutions to the high level waste tanks for eventual vitrification.

• At the Oak Ridge Reservation, complete major risk reduction remediation projects, including excavation, treatment, and off-site disposal of highly contaminated sediments from ORNL surface impoundments, and excavation of uranium contaminated soils from the Y–12 Boneyard/Burial site and disposal in the new on-site disposal cell. The request also continues D&D work at East Tennessee Technology Park, including completing the dismantlement of two of the three remaining cascade units in Building K–31.

• At the Paducah Gaseous Diffusion Plant in Kentucky, complete high priority remedial actions, including cleanup of the North/South diversion ditch and continue scrap metal removal and groundwater actions, as well as characterization of high priority DOE Material Storage Areas.

• At the Portsmouth Gaseous Diffusion Plant, complete high priority remediation projects, and continue groundwater remediation, storage yard removal, and disposal of mixed low level waste.

• At West Valley in New York, continue decontamination of spent fuel processing and storage facilities, and continue construction of the Remote-Handled Waste Facility that will be used to prepare transuranic and other high-activity waste for shipment and disposal. We will complete all vitrification processing operations and deactivation of vitrification facilities, including shutdown of the melter, by the end of fiscal year 2002.

• At the Nevada Test Site, continue low-level waste operations in support of the DOE complex and priority remediation work, including modeling activities at the Underground Testing Area, and remediation of 13 industrial sites.

• At Brookhaven National Laboratory in New York, continue high priority groundwater monitoring and remediation, and finalize and begin implementing the cleanup plan for the Peconic River.

Focusing on cleanup: This budget request is the first reflection of a key tenet that success for the EM program requires a laser-like focus on its core mission of cleanup and closure. If activities do not support that mission, then EM should not be doing them. This budget request begins to implement this tenet by shedding several activities traditionally funded by EM, but which are not essential to achieving the Department's cleanup goals. For example:

• The request reflects a significant reduction in funding in headquarters-controlled and -managed accounts. Overall, funding for such headquarters-based programs and support services will be reduced to almost 50 percent of the fiscal year 2002 levels. While our request significantly reduces support services for headquarters-directed activities related to such programs as pollution prevention, hazardous worker training, and long-term stewardship, these functions will continue at some level as appropriate, but will be carried out by Federal employees rather than contractors.

• The budget request also reflects major shifts in the structure of the EM technology program to focus efforts on specific, short-term applied technology needs for cleanup and closure. These changes are discussed below.

REFOCUSING SCIENCE AND TECHNOLOGY

EM's fiscal year 2003 request of $92 million for science and technology is significantly less than the $204.7 million appropriated in fiscal year 2002. This is the result of a dramatic shift in the program structure to ensure it is clearly focused on meeting cleanup and closure needs.

In parallel with the broader review of the EM program, we have also undertaken an in-house evaluation of EM's Science and Technology (S&T) Program. As a result of this review, we concluded that an integrated technology program is an essential element for successful completion of the EM cleanup effort and for post-closure requirements. However, for the program to have maximum impact, it must be stream-

lined and highly focused on a limited number of critical, high-payback activities where real, measurable improvements can be gained versus a larger number of activities that offer only marginal improvement. It must be end-point and risk-driven to provide the necessary technical basis for future decision making.

Toward this end, we are reorienting the S&T program to focus on two primary areas: (1) direct technical assistance to closure sites to ensure they have the necessary technology and technical support to meet closure schedules, and (2) alternative approaches and step improvements to high-risk, high-cost baselines to ensure all possible alternatives have been evaluated and that workable alternatives are available and used as the cleanup progresses. EM will execute this new approach using streamlined management structures and processes.

As the first step, we are thoroughly reviewing ongoing activities to determine their applicability to the new areas. By June 30, 2002, we expect to have decisions on these activities and an operational plan for transitioning and managing S&T activities in fiscal year 2003 and beyond. We believe this realigned S&T program will better suit the Department's needs.

CONCLUSION

The changes that I envision are not changes on the margin. The reforms undertaken thus far are but a beginning, and must permeate the entirety of the scope and management of this program to create and sustain meaningful measurable success. They are a complete overhaul of the Department's environmental cleanup program that cannot afford to wait.

I believe we face an historic opportunity to refocus, reshape, and transform this program. All of us, and all of our regulators and stakeholders throughout the country, want the same things from this program: accelerated cleanup and risk reduction. Making the changes we propose will not be easy. It will involve painful changes in the way all of us do business. I believe we have no alternative. The status quo is not an option. Muddling through and hoping for something different later is not an option. We cannot wait for a future time in the hope that making these changes might be easier.

This is our moment. If we do not start to do what is needed now, we will have failed the taxpayers of today and the future generations of tomorrow.

This is a marathon, not a sprint. This is not a process that will be completed overnight, but neither can we afford to delay. Delay only leads to increased cost and lack of real risk reduction. Eventually, delay will turn festering high cost problems into immediate public health risks.

If we are ultimately to be successful, we need your help. I ask your support for the budget request before you. It is a critical first step to achieving our mutual goal of completing the cleanup of the nuclear weapons sites. I look forward to working with Congress and others to achieve this goal.

Senator REED. Thank you very much, Madam Secretary.

We will have a round of questions for 6 minutes each and, if appropriate, a second round. Let me begin by focusing again on the new cleanup reform initiative. Could you give us a description of the goals of this account, this new program?

Ms. ROBERSON. In general terms, the goal of this account is to reinvigorate our efforts to learn from past experience and past investments. For instance, you cited our science and technology program. We have a number of technologies that we have made investments in, and we want to evaluate those investments and their results and determine whether those technologies are ready to be deployed to help address existing problems that we have otherwise not been able to overcome.

So the focus of the program is to provide the opportunity to reinvigorate the program, refocus on our priorities, streamline and delayer the organization, and apply our resources more directly and visibly to the work before us.

Senator REED. There is some discussion or at least the suggestion that $430 million of this $800 million fund has been committed already to the Hanford site in Washington. Is that correct?

Ms. ROBERSON. We have reached an agreement with the State of Washington and the Environmental Protection Agency on an accelerated strategy for cleanup at the Hanford site and we have costed that out and our estimate is that it will require an additional $433 million.

Senator REED. Now, that leaves approximately $370 million in this new account. Is that enough to help meet compliance agreements or create incentives for the States and contractors to make additional progress at all the sites you have to deal with?

Ms. ROBERSON. Yes, sir, Mr. Chairman, we believe it is. The administration's commitment is to amend its request if we reach agreements at more of our sites and the $800 million is not sufficient.

Senator REED. It also raises the question that the resources that you are targeting for this new initiative almost necessarily come in part from reductions in other areas. Does that leave you vulnerable to not meeting the court-ordered, court-mandated requirements that you face around the country?

Ms. ROBERSON. Mr. Chairman, we believe that we can meet our cleanup agreement milestones. But our obligation is to go beyond that and address our environmental obligations more broadly and integrate all of our activities. The additional funding that we ask for allows us to meet our legal commitments as well as advance the cleanup more broadly.

Senator REED. So you are confident that you have enough resources to meet all of the ongoing legal obligations you have and that this $800 million is in effect a new initiative that would allow you to do things differently, accelerate cleanup, apply more effort at sites that are already being handled; is that fair?

Ms. ROBERSON. Mr. Chairman, yes, I believe so. But I would also emphasize that we are not viewing the $800 million in isolation from the base budget. We believe it provides us the opportunity to also look at the activities built within the base budget, and that the cleanup strategies that are being developed at our sites across the complex look at the totality of the environmental obligations we have at each site.

Senator REED. Now, essentially, because the $800 million cannot possibly cover every site in this country, what are the criteria you are using to determine, for example, that the Hanford site would get $433 million and perhaps another site would get $20 million or $30 million or nothing?

Ms. ROBERSON. Well, I would like to address that in general terms, but I would be glad to provide more detail in writing, because we have looked at each site. I am sure you are aware we have a baseline cleanup program at each site. So the primary criteria is more direct and timely resolution of those issues based upon experiences we have had, both successes and failures and lessons learned.

So it would be different depending on the environmental issues at each site. But acceleration is the key.

Senator REED. Now, to qualify for this new money in this new cleanup reform account, must the States renegotiate their agreements with the Federal Government in some way? Is that part of the quid pro quo?

Ms. ROBERSON. No, sir, that is not. No, sir, Mr. Chairman, that is not a requirement. Let me say two things. The agreements that we speak of in this program are not the Federal facilities agreement on cleanup. This is not an assault on those agreements. However, I will say, as in Hanford, in working with the State Department of Ecology and the EPA, the opportunities to accelerate that impacted milestones on those commitments we believe should be addressed and I believe that the regulators and States have agreed with that.

But that is not the going-in position we have. We are not starting with the regulatory agreements. The scope that we are trying to reach strategic agreement on is our total environmental obligation at a site.

Senator REED. But is it implicit in your discussions with the States that they have to be flexible in terms of not only the agreements, but also perhaps the standard of cleanup, to get this extra money?

Ms. ROBERSON. That is not implicit in our process. I can tell you what is implicit is that in many of our agreements we have fairly difficult processes to work through, and so there are cases where we are suggesting modifications to the structural processes.

Senator REED. But no modification to the standards? The standards remain the same?

Ms. ROBERSON. I do not believe we have suggested in any State that we change the standard.

Senator REED. Just a final point, then. Essentially you are looking at a range of different facilities that have to be cleaned up. You are not implicitly or explicitly going in and demanding any changes in the cleanup agreements, any lowering of standards, anything else. How does the State then distinguish themselves, make themselves eligible for this money?

Ms. ROBERSON. Well, what we are doing is sitting down with the regulators, both State and Federal, at each site and proposing and in some cases actually developing in conjunction with them a strategy to accelerate the cleanup. There will be cases where that does in fact affect milestones or structural processes built into the cleanup agreements. We would hope that they would consider those.

But we are not coming in and plopping something down on the table and saying, you take it or leave it. That is not the way this process works.

Senator REED. In terms of this, the request for research and development, there is a substantial decrease, it appears, in the budget submission. One of the points that I made in my statement was that the future depends a great deal on new, innovative, and cost-effective techniques, and if we do not fund that type of research we will end up doing the same thing we did last year and the year before and spending probably more money.

Why are we decreasing the research and development so much?

Ms. ROBERSON. Well, our science and technology program is a key constituent of the accelerated cleanup and accelerated cleanup reform. In structuring our fiscal year 2003 budget and reforming the program, we placed our emphasis on integration of technology investments and accelerated cleanup. Our goals in that were to optimize the investments previously made in science and technology,

to concentrate on high-risk, high-cost problems, and to streamline and delay the science and technology organization and processes both at headquarters and in the field.

Second, consistent with this philosophy, the Environmental Management Science Program, which is focused on long-term research and development, has been transferred to the Office of Science's newly created environmental remediation program. The Science office is making significant investments in environmental research and will continue to work closely to meet EM's basic research needs for the future.

Senator REED. You seem to have anticipated that question, Madam Secretary.

Senator Allard.

Senator ALLARD. Thank you. Thank you, Mr. Chairman.

I want to just reiterate again for the record, Madam Secretary, that the Rocky Flats site is scheduled to be cleaned up and closed by 2006, and in fact upon closure the site will be designated as a national wildlife refuge for generations to enjoy in the future. The 2006 closure date is about 60 years earlier than the baseline closure date that was anticipated in 1996.

Additionally, the 1996 baseline budget anticipated the Rocky Flats site spending over $30 billion to be cleaned up and closed. The 2006 closure plan will cost about $7 billion.

I have about 15 questions I want to ask you in relation to Rocky Flats. I would just request that you simply give us a yes or no answer if you can. I do not mean to be hostile—lawyers use that with a hostile witness. I certainly do not view you as a hostile witness. In fact, I view you as a friend, but time may not give us an opportunity to get into a lot of the detail. But elaborate briefly, so I can just get it on the record here and stay within my time limit. I want to keep the chairman happy here.

If all issues outside of Rocky Flats were kept on schedule, are there any issues specifically on the site that would cause a 2006 closure date to be missed?

Ms. ROBERSON. The project currently is on schedule and slightly under cost, so we believe that we could achieve the intended scope.

Senator ALLARD. Is the contractor completing their work on time and within budget to complete the cleanup and closure of Rocky Flats by 2006?

Ms. ROBERSON. Yes, sir.

Senator ALLARD. Is there adequate funding to complete the cleanup and closure of Rocky Flats by 2006?

Ms. ROBERSON. With the continued support of Congress, yes, sir.

Senator ALLARD. Are there any current or anticipated technical obstacles which would delay the completion of cleanup and closure of Rocky Flats by 2006?

Ms. ROBERSON. Briefly, the project is very challenging. There are still some small waste streams that we are working on, but they are not critical to the schedule right now.

Senator ALLARD. Are there any current or anticipated safety issues which would delay the completion of cleanup and closure of Rocky Flats by 2006?

Ms. ROBERSON. No, sir.

Senator ALLARD. Are there any current or anticipated problems with the work force at Rocky Flats which would delay the completion of cleanup and closure of Rocky Flats by 2006?

Ms. ROBERSON. I do not believe so.

Senator ALLARD. Are there any current or anticipated problems with the State of Colorado which would delay the completion and closure of Rocky Flats by 2006?

Ms. ROBERSON. I do not believe so.

Senator ALLARD. Are there any current or anticipated problems with the Department of Energy field office in Colorado which would delay that 2006 closure?

Ms. ROBERSON. I do not believe so.

Senator ALLARD. Are there any current or anticipated problems with the Department of Energy's Office of Environment, Safety, and Health (ES&H) which would delay completion?

Ms. ROBERSON. I do not believe so.

Senator ALLARD. Are there any current or anticipated problems with any other office within the Department of Energy which would delay the closure of Rocky Flats by 2006?

Ms. ROBERSON. At this time, none that I am aware of, sir.

Senator ALLARD. Thank you. Are there any current or anticipated problems with the Office of Management and Budget (OMB) or the White House which would delay the completion date scheduled for 2006 on Rocky Flats?

Ms. ROBERSON. None that I am aware of.

Senator ALLARD. Are there any current or anticipated problems with the EPA or the Defense Nuclear Facilities Safety Board (DNFSB) which would delay that closure beyond 2006?

Ms. ROBERSON. No, sir.

Senator ALLARD. Are there any problems occurring in either the Hanford site, Idaho, Oak Ridge, WIPP, or Yucca Mountain which you anticipate will delay the competition of cleanup and closure of Rocky Flats by 2006?

Ms. ROBERSON. None that I am aware of.

Senator ALLARD. Other than issues within the State of South Carolina, are there issues associated with any organization, State, nation, or other entity which you anticipate will delay the completion of cleanup and closure of Rocky Flats by 2006?

Ms. ROBERSON. None that I am aware of.

Senator ALLARD. So as I understand it, Madam Secretary, other than some issues not impacting the critical path, the only issue that will delay the closure of Rocky Flats past 2006, and in fact places closure at risk for the foreseeable future, is the inability to ship certain materials to South Carolina?

Ms. ROBERSON. Yes.

Senator ALLARD. Mr. Chairman, in my view the responsibility for failing to clean up and close Rocky Flats by 2006 falls directly on the Governor of South Carolina. He not only puts the closure of Rocky Flats at risk, but the entire nuclear complex.

Moving on to another question, the National Nuclear Security Administration has responsibility of shipping many of the EM waste types, including surplus plutonium. With the closure of sites like Rocky Flats and the proposed acceleration of cleanup of the

four major EM sites, I think it is a very important thing that the shipping of those wastes occur on schedule.

Are you confident that NNSA will keep the shipping of plutonium and other special nuclear material from EM sites on schedule?

Ms. ROBERSON. Senator Allard, is this a yes-no?

Senator ALLARD. No, you can elaborate on this one if you would, please.

Ms. ROBERSON. OK. I have the opportunity and pleasure of working very closely with Dr. Beckner, and I believe they are committed. We are working very aggressively. Clearly, delays in this schedule can continue to challenge their ability to support the shipping campaign from Rocky Flats to Savannah River on the schedule that we have asked them to, but we clearly still have the opportunity to do so.

Senator ALLARD. How do the delays caused by the State of South Carolina impact the shipping schedule of materials coming out of Rocky Flats?

Ms. ROBERSON. Well, I think Dr. Beckner will be prepared to respond to that.

Senator ALLARD. OK.

Ms. ROBERSON. But continued delays simply put us in a position of having to make choices between how to use the transportation resources.

Senator ALLARD. It looks like my time has expired, Mr. Chairman.

Senator REED. Do you want a second round?

Senator ALLARD. Yes, in the second round I will catch up.

Senator REED. Senator Inhofe.

Senator INHOFE. I hope everyone is observing a record has now been set. I spent 8 years in the House and now nearly 8 years in the Senate. That was a total of 18 questions that were asked and answered in 6 minutes. That has never happened before in the history of the institution, and I do not know which one to compliment. But I make a request, Madam Secretary, that you not be so short and brief in response to my questions.

First of all, I want to get back to what I said. I recognize also that some of the problems in the environmental standards and rules and regulations that we are experiencing on our various military installations are not on your end.

There are some that are like water runoff. When you get into endangered species, for example, and the endangered species program in the Southeastern United States, the better job we do, the more serious the problem becomes. Camp Lejeune and Fort Bragg, where they have red ribbons around training areas because it is a suspected habitat of the red-cockaded woodpecker, and so the better job they do the more red ribbons there are.

But there are many areas that do affect you. So what I would like to do is ask you for the record: When I heard that the legislation is being considered by the administration—and I have been talking about that and actually opposing it for quite some time. I am very interested in the status of that. It is something that directly affects the readiness of our military.

I can tell you right now, in many areas the cost of compliance with environmental regulations in our training areas exceeds the cost of ammunition. So I see that as something that is very serious.

Following up a little bit on what the chairman talked about on the adequacy of the budget, I have to ask the same question. You mentioned in your opening statement the $6.7 billion is essentially the same as last time, and yet the problems we know are greater now than they were last time. I took some time and went around to various installations such as the closing and the cleanup of McClellan, plutonium being the main villain there, and the guys that do not come here to testify but talk to me on the ground say that they do not know what kind of an end is in sight, but it was dramatically underestimated as to what the ultimate costs would be.

I know it is very difficult to do that, but I think it is important for this committee to know as early as possible if you think it is not going to be adequate, the amount that is there. It just seems to me that if the amount is essentially the same as it was last time that it would be a problem.

Is there anything you want to add to what you said about the budget and about problems that you see coming up?

Ms. ROBERSON. Senator Inhofe, we are working very aggressively to do just as you just noted. We have deployed teams all over the complex and I personally am engaged in evaluating and discussing the strategy to accelerate the cleanup at every site. We are not at this moment in a position to identify whether more funds will be needed than the $6.7 billion, but we are working very aggressively and we expect that we would be within the next 30 days.

Senator INHOFE. I think it is important for another reason, too. There has been a lot of discussion about future BRAC rounds. One of the arguments against it is that we know that there is some time in the future when you close an installation where money savings will be achieved, but we know for sure that in the first 3 and 4 and 5 years it will be very expensive.

So it is important for those of us who are going to be making a decision at a time when our military needs much more than the budget that the President has talked about, which I think he feels is the best he can do under the circumstances, that we be able to make that evaluation so we will know what that cost is going to be. So I think it is important for us to hear from you the unvarnished truth on these things.

What was the statement you made when you said the cleanup of the environmental legacy of the Nation's nuclear weapons program and government-sponsored nuclear energy research? How critical is the role of Yucca Mountain in cleaning up these sites?

Ms. ROBERSON. Well, we are clearly counting on opening up Yucca Mountain in our plans for disposition of certain materials in the Environmental Management program. The Department's long-term plans for high-level waste and spent nuclear fuel requires the opening of Yucca Mountain. Where the opening of the repository may be delayed, EM cleanup plans therefore might not be immediately affected, but clearly it would require some additional investment to look at storage and other alternatives for disposition, because we have no other alternatives right now.

Senator INHOFE. The cost to that, have you done some analysis? Let us say for some unforeseen reason, which I do not think is going to happen, it should not become available; then what would the cost be?

Ms. ROBERSON. I am sure the Department has, but I do not have that at hand with me, sir.

Senator INHOFE. That would be a good thing for the record, to give some approximate cost there.

[The information referred to follows:]

COST TO EM PROGRAM IF YUCCA MOUNTAIN IS NOT DEVELOPED

The Department of Energy assessed the costs of not opening a geologic repository for high-level radioactive waste and spent nuclear fuel. The life cycle cost impacts to the DOE's Environmental Management program for not opening a repository are estimated to be $12.1 billion (in fiscal year 1998 constant dollars) over the next 100 years (*Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain,* February 2002). These costs are primarily to place DOE-owned spent nuclear fuel in safe long-term storage. After that 100 year period, the cost would be approximately $110 million per year (in fiscal year 1998 constant dollars), in perpetuity.

Senator INHOFE. Lastly, let me read a statement here, which you have read, I am sure, a written statement made by Bruce Tarter, Director of Lawrence Livermore National Lab. He says: "All stored radioactive wastes will remain at Livermore because there will not be funding available for the disposal offsite. Lack of space will prevent the laboratory's hazardous wastes management department from accepting newly generated radioactive wastes. This will shut down critical work on stockpile stewardship."

I guess the question I would have is, do you feel that this could have an effect on some of the programs such as stockpile stewardship? What effect do you see?

Ms. ROBERSON. I am not sure if he is referring to hazardous wastes, mixed waste, or transuranic (TRU) waste.

Senator INHOFE. Hazardous waste.

Ms. ROBERSON. Hazardous waste. The Department has actually invested in processing and treatment capability at Lawrence Livermore, which has not yet been started up. We are in the process of trying to accomplish that. So we do believe we will provide some relief for that site and for the lab with the startup of those operations.

Senator INHOFE. Thank you, Madam Secretary.

Ms. ROBERSON. Thank you.

Senator REED. Thank you, Senator Inhofe.

Madam Secretary, I just have one question and then I will turn to Senator Allard. In our previous discussions you indicated that if there was a shortfall of funding that there would be a commitment or that it would be the commitment of the administration to get additional funds. How would those additional funds be authorized and appropriated? Are you considering, at least as a contingency, a supplemental appropriation for this year or next year?

Ms. ROBERSON. As the administration identified in its budget submission to Congress, I believe that the Office of Management and Budget is considering both options, depending on how far along we can get in the development of these agreements and what the funding needs are. If we have agreement and can identify the fund-

ing need before the appropriations process proceeds too far, we would amend our request.

Senator REED. Very good. Let me ask an additional question. If the Price-Anderson indemnification authority is not extended for DOE defense contractors prior to August, will you be able to enter into any new contracts after August?

Ms. ROBERSON. Well, should Price-Anderson expire without reauthorization, we would have to look to authority under other statutes to provide protection for the contractors. However, it is my understanding that authorities under other laws are limited and that authority comparable to that available under Price-Anderson does not exist.

If the Department's Price-Anderson authority were not available for an extended period of time, we would have to reevaluate some of our planned procurement actions and strategies. Termination of existing contracts in favor of a new renegotiated competed contract may have to be postponed until that is resolved.

Senator REED. Thank you, Madam Secretary.

Senator Allard.

Senator ALLARD. Mr. Chairman, if I could follow up on your Price-Anderson question. I had two and you asked one of my two questions. The second one I have is are there any national security missions that would be at risk if Price-Anderson is not authorized?

Ms. ROBERSON. Well, I think for the Environmental Management program the primary concern would be securing contract services to carry out the mission. So, with the assumption that the current contracts would stand, any new procurements we think would be at risk.

Senator ALLARD. Your fiscal year 2003 budget requests greatly reduced funding for the long-term stewardship program. However, the DOE will not be able to walk away from its sites without putting in place long-term monitoring and surveillance plans which are accepted and approved by the host States. What are the anticipated costs associated with the long-term stewardship responsibilities and give us some insight into the program, if you would?

Ms. ROBERSON. Again, I do not have a handy estimate for the total long-term stewardship program. The total I would like, if we can, to provide that to you in writing, sir.

[The information referred to follows:]

LONG-TERM STEWARDSHIP

The fiscal year 2003 budget request for long-term stewardship provides the Department the resources necessary to perform the required post-cleanup remedy monitoring and maintenance activities at our completed sites. The Department cost-effectively manages over 30 completed sites through our Long-term Surveillance and Maintenance program. Funding for this program has been consistent at approximately $5.5 million per year, which is sufficient to maintain our current long-term stewardship requirements at our sites.

In addition, the fiscal year 2003 request allocates $1 million for long-term stewardship policy and guidance development. This level of funding is sufficient based on the technical capacity and performance of the Federal long-term stewardship staff. Previous year funding requests contributed to the successful completion of the report to Congress in fiscal year 2001, the National Long-Term Stewardship Study in fiscal year 2002, and the Strategic Plan in fiscal year 2002. We also expect to complete the Science and Technology road map in fiscal year 2003. Together these documents complete the foundational basis for our long-term stewardship efforts.

Costs associated with managing the long-term stewardship at sites include both the remedy monitoring and maintenance costs as well as the land management/land ownership costs. The Department is evaluating the possible transfer of Department-owned land, including land with associated long-term stewardship responsibilities, to Federal land management agencies, interested local or tribal governments, or appropriate private entities. Regardless of the ultimate disposition path, the Department will assure the land is managed consistent with a Federal land management mission and/or consistent with local values and needs (e.g., economic development, natural resource protection, or open space).

In January 2001, the Department provided to Congress a report on long-term stewardship that included an estimate of approximately $100 million (in fiscal year 2000 constant year dollars) per year for post-closure care after cleanup at all sites had been completed. There are, of course, significant uncertainties associated with the estimate. Moreover, we are in the process of developing accelerated cleanup plans for the DOE sites that may change the cost of post-closure care.

Ms. ROBERSON. We have not reduced our effort in long-term stewardship. The reduction in funding that we see in the fiscal year 2003 request is a reflection of our commitment to carry out our Federal responsibility in the long-term stewardship area. We have a team of Federal employees carrying out the work that had been distributed among a host of contractors, to refocus that program.

We also refocused the policy-setting for long-term stewardship in headquarters to allow us to bring about effective lessons shared and consistency in the way we carry it out. So our emphasis on long-term stewardship has not been reduced one bit. In fact, it has increased.

Senator ALLARD. I would like to go back to the chairman's comments on money that you set aside for cleanup reform. What you propose will require each site to review their current cleanup proposal and then to present to DOE an accelerated cleanup proposal. Can you summarize the administration's reasons for proposing the accelerated cleanup initiative?

Ms. ROBERSON. The primary reason for proposing the accelerated cleanup initiative is a result of the insights gained in the evaluation of the program that Secretary Abraham commissioned that we titled the "Top-To-Bottom Review." There were a number of insights in the Top-To-Bottom Review which led to this structured proposal. In simple terms, those were that we had opportunities to accelerate the work that we were not taking advantage of, that we had an infrastructure built up in the program that should be streamlined and refocused on getting the work done, and that in general terms the employees in this program and our contractors have to be reminded that our job is actually to reduce risk and complete the cleanup, and that these programs, although there are other obligations that come as the weapons program modernizes and other things happen, the Environmental Management program certainly has other projects, that we are not proceeding aggressively to address those environmental problems captured in the program today.

Senator ALLARD. What has been the response by the States and regulators to this initiative?

Ms. ROBERSON. I think the response has been cautious optimism. We have had discussions, I believe, with just about every State, with the regulators in every State in which we have a site, not just the large sites, the small sites as well. I have had the opportunity to speak with the regulators myself.

At most of our sites there is a proposed accelerated strategy that has been put on the table. In many States it has been developed in conjunction with the regulators, and it is undergoing evaluation. In some cases it is undergoing evaluation by DOE because it was proposed from the site rather than with the involvement of headquarters.

So I believe the reception has been cautious optimism, and I am appreciative of that and I think that Congress and the Department will benefit from that.

Senator ALLARD. I am assuming that with this new accelerated cleanup you are going to rely on new technologies for waste processing. If so, how will the feasibility of these new approaches be tested without a strong science and technology program within EM?

Ms. ROBERSON. We think we are maintaining a strong science and technology program. We also believe leveraging that research, basic research side of the program, with the Office of Science, who have the ability to look across all of DOE and help us identify those opportunities to advance, will help us even more.

So even though the dollars are less, we actually believe our actions are strengthening our effort and our ability to invest in those science initiatives and technologies that are going to advance the program. There are two things we are doing: one, we are trying to leverage in the basic science area with the science program; and two, we are going through a review out there at the sites today, to be completed by the end of April, where we look at application of those technologies that we have already invested in.

Senator ALLARD. Mr. Chairman, that completes my questioning.

Senator REED. Thank you very much.

Thank you, Madam Secretary, for your testimony today and your work, not only in the past but in the days ahead. Thank you very much.

Ms. ROBERSON. Thank you, sir.

Senator REED. Let me call the second panel forward. [Pause.]

Our second panel today consists of Dr. Everet Beckner, Deputy Administrator for Defense Programs, and Mr. Ralph Erickson, the Associate Administrator for Facilities and Operation of the National Nuclear Security Administration. Welcome, gentlemen. Thank you for joining us today.

In addition, we have written testimony from Admiral Bowman, the Deputy Administrator for Naval Reactors, that will be included in the record.

[The prepared statement of Admiral Bowman follows:]

PREPARED STATEMENT BY ADM. FRANK L. BOWMAN, USN

Thank you for inviting me to submit a statement on Naval Reactors' fiscal year 2003 Department of Energy budget request.

Let me also thank you for the faith you continue to place in my program and for protecting the core values that have been the hallmark of the program's success for more than 50 years. Through your diligent efforts and support, our nuclear fleet remains deployed around the world, fully engaged in the war on terrorism.

We all recognize that the threats our country faces today are as great as anytime in the past. We also know these threats are not limited to hostile nations with fixed borders but can come from organizations with no fixed borders, operating under a veil of secrecy and outside the international community.

Our ongoing campaign against terrorism underlines the importance of nuclear-powered ships in defending our national interests and in responding to aggression against the United States. As our Nation was being attacked on September 11, U.S.S. *Enterprise* was headed home, by way of a planned port visit. Upon seeing the attack on our country on CNN at sea, the captain ordered the rudder hard over and U.S.S. *Enterprise* reversed course and prepared for action as the first aircraft carrier in position to respond to the attack. Also, a nuclear-powered submarine was within striking distance to attack targets in Afghanistan on September 11.

When the President did order our military forces into action, aircraft from the nuclear-powered aircraft carriers, *Enterprise* and *Carl Vinson*, along with Tomahawk missiles launched from submarines and surface ships, carried out the initial attacks on targets in Afghanistan without any of the restrictions imposed on most land-based aircraft. Our nuclear fleet again demonstrated its capability to operate freely over much of the globe within striking range of the majority of targets.

It is more than a commercial—our aircraft carriers are 4½ acres of sovereign U.S. territory from which we can conduct sustained combat operations quickly and without having to negotiate staging rights on foreign soil. Nuclear power enhances these warships' capability and flexibility to sprint where needed and arrive ready for around the clock power projection and combat operations. Sustained high-speed capability (without dependence on a slow logistics train) enables rapid response to changing world circumstances, allowing operational commanders to surge these ships from the United States to trouble spots or to shift them from one crisis area to another. Nuclear propulsion helps the Navy stretch available assets to meet today's worldwide commitments.

Our 54 operational nuclear attack submarines (SSNs) in the Navy's inventory possess inherent characteristics such as stealth, endurance, mobility, firepower, and multimission flexibility. These characteristics allow submarines unfettered access to contested battlespace 24 hours a day, 7 days a week, for as long as required. Once there, submarines can covertly monitor adversaries without risk of political or military escalation—a particularly valuable capability since adversaries understand and can sometimes avoid reconnaissance. Should tensions escalate, submarines can also execute Tomahawk strikes from undisclosed locations without warning, often from inside an adversary's defensive umbrella.

The Nation's 18 strategic ballistic missile submarines (SSBNs) continue to form the bedrock of the country's strategic deterrence. These submarines carry the majority of our nuclear triad's warheads and are the most survivable units in this force, at the least cost.

Many of the impressive capabilities these ships possess were developed with funding that was supported by this subcommittee.

While new development is important, the number-one priority is ensuring the officers and sailors that are out there defending our Nation's interests are operating safe, effective nuclear propulsion plants. This is where most of Naval Reactors' funding goes. Today, the Naval Reactors program supports 102 reactors in 54 operational attack submarines, 18 ballistic missile submarines, 9 nuclear-powered aircraft carriers, 4 training and prototype platforms, a deep submergence vehicle, and 1 attack submarine undergoing inactivation.

The average age of these ships today is 16½ years, but this average will exceed 22 years by the end of the decade because so few new ships are being added to the fleet. As these ships age, they place a greater and greater demand on Naval Reactors' DOE budgets.

Also, with the funding authorized by this subcommittee, we are designing better, more cost-effective nuclear propulsion plants for the future. When the Navy's new *Virginia*-class attack submarine is delivered, it will provide needed capability for the 21st century at an affordable price. The reactor plant design uses advanced component and systems technology—including the first core designed from the start to operate throughout the life of the ship. The *Virginia*-class also has a simplified plant arrangement with fewer components compared to previous designs, which reduces construction costs and will reduce future maintenance costs.

The nuclear propulsion plant design of the new CVNX-class aircraft carrier is well underway. The CVNX reactor plant will provide 25 percent more energy than *Nimitz*-class ships and substantially more electric generating capacity than the reactors and electric plant used in *Nimitz*-class ships. The extra energy will support higher operational tempos and future electrical load growth in the CVNX-class or longer life. We are designing and developing the CVNX nuclear propulsion plant without an increase in our DOE budget.

To meet the increasing demands on our submarine fleet, Naval Reactors is working on a Transformational Technology Core (TTC) to deliver a significant energy in-

crease to future *Virginia*-class ships with minimum impact to the overall ship design.

New transformational capabilities will soon be coming to the nuclear-powered submarine fleet through the conversion of four Trident submarines into SSGNs. With these ships, the Navy will be able to give theater CINCs an extraordinary strike/Special Operating Forces capability with a flexible, survivable platform that simultaneously relieves the operational strain on our naval forces. Surface ships and attack submarines now carrying Tomahawks can be freed up for other missions—a force multiplier. To this end, we are on course for a UUV and Tomahawk demonstration in December 2002 on an *Ohio*-class submarine.

NUCLEAR FLEET ISSUE

Let me briefly discuss the most important issue I see with our submarine fleet today—put simply, we do not have enough of them:

- Today, we have only 54 operational SSNs—not enough to meet all of the Unified CINCs' and the national intelligence community's highest operational and collection requirements as identified in the 1999 Joint Staff SSN report on force level.
- Fleet operational data and Joint CINC demands clearly show the mismatch between current force structure and requirements. With force structure decreasing over the past several years, submarine operational commanders have had to reduce the number of deployed ships. In spite of the fact that fewer SSNs have been available to deploy, the demand for submarines continues to increase, especially since September 11.
- The Navy is doing what it can to stretch existing assets to meet requirements within today's budget and overall priorities. For example:
    - We are refueling the first generation of the *Los Angeles*-class submarines and extending these submarines from 30 to 33 years. However, pushing the hull life comes at a cost. Life extension exacerbates the "aging fleet" problem. As the fleet ages, more resources are required for support, and we have our young submariners out there with outdated technology.
    - Additionally, to improve the operational effectiveness of the submarine fleet, we have taken steps to forward-base three submarines in Guam to maximize their effectiveness by putting them closer to the action.
    - To meet just the highest priority requirements being placed on the submarine fleet, we should refuel all remaining *Los Angeles*-class submarines. Two are currently scheduled for inactivation. While this is the right near-term decision to stem the bleeding for submarine force restructure, refueling *Los Angeles*-class submarines does not solve the longer-term problem with submarine force structure. Next decade, we will decommission three or four *Los Angeles*-class submarines per year as the boats built in the 1980s reach end of service life.

The only long-term solution to meeting force level requirements is to build more submarines. As we consider future budgets, we must include increasing the *Virginia*-class submarine build rate to meet the Nation's long-term force level requirement for attack submarines. The force level issue is ultimately a resource question. The practice of buying submarines one at a time will not achieve the submarine numbers we need for the future and is not a cost-effective way to buy anything, including submarines. Multiyear procurements of more than one ship per year would provide significant savings compared to one per year. Coupled with leverage from buying material in Economic Ordering Quantities, real savings can be achieved. Innovative contracting approaches should be encouraged in this period of tight resources for ship construction.

As my good friend, Admiral Bob Natter, our Atlantic Fleet Commander, says, "We can fight 'em here or we can fight 'em over there. I prefer to fight them over there." Well, me too. Everyone knows and agrees submarines will be an absolutely necessary part of fighting them over there. Deputy Secretary of Defense Paul Wolfowitz recently said we must exploit our military strengths as the war on terrorism continues. These strengths, he said, are intelligence, precision strike, and the ability to operate underwater. Well, that sounds just like submarines to me. We need to get going.

FISCAL YEAR 2003 DEPARTMENT OF ENERGY BUDGET REQUEST

Naval Reactors' fiscal year 2003 DOE budget request is $708 million, an increase of only $5 million after inflation from fiscal year 2002 to fiscal year 2003. To put my budget request in perspective, it is less than 4 percent of the DOE budget. From

the early 1990s to 2000, Naval Reactors' budget has declined 32 percent in real terms, and has remained fairly steady for the last 3 years.

Naval Reactors supports the 81 nuclear-powered warships that make up over 40 percent of the Navy's major combatants. This responsibility includes ensuring safe and reliable operation of reactor plants in these ships, enhancing the reactor plants' performance, as well as developing improved reactor plants to support the Navy's needs for the future.

Sustaining today's 102 operating reactors requires continual analysis, testing, and monitoring of plant and core performance. Nuclear propulsion is a demanding technology—the harsh environment within a reactor plant subjects equipment and materials to the harmful effects of irradiation, corrosion, high temperature, and high pressure over a lifetime measured in decades. In addition, Naval Reactor plants must be rugged enough to accommodate ships' pitching and rolling; have the resilience to respond to rapidly changing demands for power; be robust enough to withstand the rigors of battle and shock; and be safe and easily maintainable by the sailors who must live next to them.

Naval Reactors' DOE laboratories have made significant advancements in components, materials, core lives, and predictive capabilities. These advancements allowed the Navy to extend the service life and intervals between major maintenance periods for nuclear-powered warships and to reduce ship off-line time for maintenance. Increasing ship availability also increases the Navy's warfighting capability, while reducing maintenance costs. Added ship availability is particularly important in the face of fleet downsizing, because the operational demands on each remaining ship continue to increase. In the same vein, some development effort is devoted to ensuring Naval Reactors can meet the Navy's need to extend warship lifetime. Longer ship lifetimes are achievable because we are able to extend reactor plant lifetime. But longer lifetimes require more resources to support an older fleet.

We are able to extend the lifetime of existing reactor plants because of the robust designs that resulted from solid engineering and design work done upfront. After significant additional engineering work, we determined that those reactor plants will be able to stay in service longer than we had originally intended. The engineering work to support those ships in their extended lives will continue during that period of life extension. For new reactor core and reactor plant designs, we are using the experience of the past 50+ years to incorporate improvements into both design and construction. It is imperative that we continue to deliver robust designs. It is equally important that we do the necessary engineering work now to ensure that those reactor plants are able to meet the needs of national defense now, and for the next several decades.

New plant development work at the program's DOE laboratories is focused on completing the design of the next-generation submarine reactor for the Navy's new *Virginia*-class attack submarines and on continuing the design for a new reactor plant for the Navy's new CVNX-class aircraft carriers.

The design of the reactor plant for the *Virginia*-class submarine is nearly complete. Today, 100 percent of reactor plant components have been delivered—all on schedule to support ship construction, and within budget. The pre-reactor-fill testing and initial reactor fill for the lead ship have been completed. Reactor plant construction is over 98 percent complete, and overall lead ship construction is over 70 percent complete and on schedule. *Virginia* is expected to go to sea in fiscal year 2004 and will provide needed capability for the Navy at an affordable price.

CVNX is the first new carrier designed since the 1960s *Nimitz*-class. The CVNX reactor plant will build on three generations of nuclear propulsion technology developed for submarines since *Nimitz*. This plant will incorporate needed advancements in warfighting capabilities and significantly reduce lifecycle costs.

Reactor plant design work is on schedule to support the long design and manufacturing lead-times of reactor plant components needed for the CVNX ship construction schedule. Current design efforts include general arrangement design, system description and diagram development, and component design (such as final sizing and system interface evaluations). Long-lead reactor plant forging procurements began in fiscal year 2001, and the first reactor core procurements will begin in fiscal year 2003. Necessary system descriptions and general arrangements required for later design activities have been established.

Major inactivation work on shutdown prototype reactors is nearly finished. The last of the prototype reactor plants at the Naval Reactors Facility in Idaho was defueled in fiscal year 1999. Inactivation and cleanup work at the Windsor site in Connecticut is complete, and regulatory approval for unrestricted release has been requested. The two shutdown prototype reactors at the Kesselring site in New York have been inactivated and defueled, and major dismantlement work will be completed in fiscal year 2002.

PROGRAM BUDGET REQUIREMENTS

Naval Reactors' fiscal year 2003 DOE budget request of $708 million is adequate to meet Program requirements for now. To live within our means over the past several years, Naval Reactors has eliminated infrastructure, consolidated functions and facilities, revised work practices to become more efficient, and downsized the nuclear industrial base. To support higher priority efforts—fleet support, CVNX- and *Virginia*-class reactor plant designs, spent fuel processing, and prototype inactivation work—I have deferred important work, such as advanced reactor technology work and technology development for a submarine with electric drive, dismantlement and clean up of shutdown facilities and laboratory facility upgrades. It is not healthy to defer advanced concept development for a long period. This is the seed corn to meet future requirements and to ensure that we maintain our preeminent position in naval power. In addition, my laboratory facilities are approaching or exceeding the 50 year point and need upgrading and refurbishment. Also, we are beginning development of a new, high-energy core to meet fleet demands in the future. I am reviewing future resource requirements to determine what will be necessary to deliver technology the fleet will need in decades ahead.

NAVAL REACTORS FISCAL YEAR 2003 DEPARTMENT OF ENERGY BUDGET DETAIL

Naval Reactors' technical budget request is categorized into four areas of technology: *Reactor Technology and Analysis, Plant Technology, Materials Development and Verification, and Evaluation and Servicing.* This approach supports the integrated and generic nature of our DOE research and development work. The results of Naval Reactors DOE-funded research, development, and design work in the following technology areas will be incorporated into future ships, and retrofitted into existing ships.

- The $228.6 million requested for *Reactor Technology and Analysis* will fund continued work on the next generation reactor for the *Virginia*-class submarine and development work on the new reactor for CVNX-class aircraft carriers, and will ensure the safe and reliable operation of existing reactors. The reduction in operating plant maintenance periods places greater requirements on thermal-hydraulics, structural mechanics, fluid mechanics, and vibration analysis work to accurately predict reactor performance and to identify and avoid problems. Also, the continued push for longer life cores means we will continue to operate reactors beyond our operational experience base for many years to come. Developing improved analysis tools and a better understanding of nuclear data will allow us to predict performance more accurately throughout extended core life. Other efforts in this area include improving and streamlining core manufacturing processes to reduce cost and hazardous waste, performing reactor safety analyses, developing components and systems to support the Navy's acoustic requirements, and developing improved shield designs to reduce costs while preserving our record of excellence in radiological and environmental control. In addition, Naval Reactors is beginning concept studies on a new high-energy core, the transformational technology core (TTC), to support increased fleet operation requirements.
- The $112.1 million requested for Plant Technology provides funding to develop and analyze those systems that transfer, convert, control, and measure reactor power to maximize plant performance. The request reflects the goal of enhancing steam generator performance, which will benefit CVNX steam generators—the largest components developed to date by Naval Reactors. Development of technologies in the areas of chemistry, energy conversion, instrumentation and control, plant arrangement, and component development will continue to improve performance and support operational requirements. Naval Reactors is also developing components to address known limitations or to improve reliability of instrumentation and power distribution equipment to replace older, technologically obsolete equipment that is increasingly difficult to support.
- The $136.2 million requested for *Materials Development and Verification* will fund essential material analysis and testing as ships are kept in service longer than originally intended as well as part of Naval Reactors' share of the Advanced Test Reactor (ATR). Reactor core and reactor plant materials will have to perform safely and reliably for a longer time. Work on the core and core structural materials includes testing and analysis of fuel, poison, and cladding materials to verify acceptable performance, as well as developing materials with improved corrosion resistance. Testing and develop-

ment of reactor plant materials also ensures reliable performance and leads to improvements such as reduced cracking and stress.

• The $144.4 million request for *Evaluation and Servicing* sustains the operation, maintenance, and servicing of land-based test reactor plants and part of Naval Reactors' share of the ATR, a specialized materials testing facility operated by the DOE Office of Nuclear Energy, Science, and Technology. Materials, components, cores, and systems in these plants provide important technical data and experience under actual operating conditions, thus allowing potential problems to be identified and addressed before they occur in the operating fleet. With proper maintenance, upgrades, and servicing, the two operating test reactor plants and the ATR will continue to meet testing needs for quite some time.

• Evaluation and servicing funds also support initiation of a dry spent fuel storage process line that will allow for placement into dry storage at Naval Reactors Facility (NRF) of naval spent nuclear fuel currently stored at the Idaho Nuclear Technology and Engineering Center (INTEC). Additionally, these funds support ongoing cleanup of facilities at all Naval Reactors sites to reduce hazards to personnel, and reduce potential liabilities due to aging facilities, changing conditions, or accidental releases.

PROGRAM INFRASTRUCTURE AND ADMINISTRATIVE REQUIREMENTS

• In addition to the budget request for the important technical work discussed above, infrastructure and administrative funding is also required for continued operation of the program. Specifically, the fiscal year 2003 budget request includes:

• *Facility Operations:* $50.0 million in funding is to maintain and modernize the program's facilities, including the Bettis and Knolls laboratories and the Expended Core Facility (ECF).

• *Construction:* $11.3 million in funding is to refurbish and replace program facilities. This includes the continuation of the ECF Dry Cell project in Idaho, which will significantly improve Naval Reactors' ability to process naval spent fuel for dry storage. (As identified and agreed to in a Settlement Agreement signed by the Department of Energy, the Navy, and the State of Idaho, Naval Reactors fuel must be among the early shipments of spent fuel to the first permanent repository or interim storage facility.) The requested funding also enables the continuation of the Major Office Replacement Building project.

• *Program Direction:* $25.4 million in funding is to cover Naval Reactors' 191 DOE personnel at headquarters and the program's field offices, including salaries, benefits, travel, and other expenses. This staff maintains oversight of the program's extensive day-to-day technical and administrative operations, while continuing to ensure compliance with growing environmental, safety, and other regulatory requirements, all of which, notwithstanding our excellent record, necessitate substantial effort.

PERFORMANCE MEASUREMENTS, GOALS, AND ACCOMPLISHMENTS

My program has a long history of operating with the highest levels of integrity and operational accountability. Our husbanding of taxpayer dollars provided by this subcommittee has been positively recognized in two very recent reports. In forwarding my fiscal year 2003 budget request to you, the Office of Management and Budget (OMB) rated Naval Reactors as "Effective" the highest adjectival rating on OMB's scale and noted: "Outputs are identifiable and make key contributions to national security. Delivery schedules are consistently met. Contracts have positive and negative incentives, and include performance requirements."

Furthermore, in a report dated December 12, 2001, the General Accounting Office recognized Naval Reactors' strong performance within DOE and NNSA. The report stated: "The Office of Naval Reactors, which is a part of NNSA, has long been recognized as having a focused mission, strong leadership, clear lines of authority, long-serving employees, and a strong set of internal controls, as well as a culture that enhances accountability and good control over its costs and contractor performance." The Naval Reactors program has always been dedicated to continual improvement. We use semiannual reviews of short- and long-range plans to rebaseline work and revisit program priorities. Monthly financial reports from contractors are used to compare actual performance against short- and long-range plans. Additionally, Naval Reactors headquarters maintains close oversight of its management and operating contractors through periodic reviews, formal audits, and performance appraisals.

For fiscal year 2001, my program met or exceeded all three major performance targets. We ensured the safety, performance, reliability, and service life of operating reactors for uninterrupted support of the fleet. We exceeded 90 percent utilization availability for test reactor plants, and by the end of fiscal year 2001, U.S. nuclear-powered ships had safely steamed over 122 million miles. Naval Reactors developed new technologies, methods, and materials to support reactor plant design, which included surpassing the fiscal year 2001 goal of 93 percent design completion of the next generation submarine reactor. We initiated detailed design on the reactor plant for the next generation aircraft carrier, which is on schedule to meet the planned ship construction start. Additionally, Naval Reactors maintained its outstanding environmental performance—no personnel exceeded Federal limits for radiation exposure, and no significant findings resulted from environmental inspections by State and Federal regulators.

CONCLUSION

The ongoing support of the Senate Armed Services Strategic Subcommittee is one of the most important factors in our success story. The subcommittee has recognized the requirements and demands the program confronts daily: a growing need for power projection and forward presence far from home, which strains our dwindling number of nuclear ships; an aging nuclear fleet; and the funding required to meet these commitments today and in the future.

The unique capabilities inherent in nuclear power have played a vital role over the past 50 years in our Nations' defense. This legacy is as strong and vibrant today as it ever has been. Actions in the Persian Gulf, peacekeeping actions in Eastern Europe, and, most recently, the war against terrorism have demonstrated the value of nuclear power. With your continued support, this legacy will continue far into the future as the Nation meets each new threat with strength and resolve. Naval Reactors' record is strong, the work is important, and the funding needs modest.

I thank you for your support.

Senator REED. Dr. Beckner, Mr. Erickson, again we welcome you to today's hearing. We look forward to discussing with you the weapons activities of the National Nuclear Security Administration, at $5.8 billion the second largest program at the Department of Energy.

Dr. Beckner, the Nuclear Posture Review (NPR) has raised more questions than it has resolved, not the least of which are the responsibilities of NNSA from now through 2012. While the NPR directs a reduction in the operationally deployed levels of nuclear weapons from the number deployed today, the NPR also directs that all of those 8,000-plus warheads be stored. The NPR does not say, however, how those warheads are to be maintained.

Is it NNSA's obligation to maintain all the warheads in a fully modernized and ready status or something else? What does the NPR mean for the stockpile life extension program? Must your agency extend the life of the total stockpile? Must your agency maintain tritium for all of the stockpile?

The NPR also talks about developing a capabilities-based approach. What does that mean for your responsibilities with respect to the stockpile? Does that include the development of new nuclear weapons?

The NPR also discusses the status of test readiness, the ability to conduct a nuclear test. Retaining the ability to conduct a nuclear test is not a new responsibility for your complex. Retaining this capability was required by President Clinton and included in President Clinton's enumerated safeguards for the Comprehensive Test Ban Treaty along with maintaining a strong Stockpile Stewardship Program.

What is an appropriate test readiness posture and how is it achieved? Does it entail the assignment of arbitrary time lines or

is it something that must be served by maintaining defined skills and capabilities?

The NPR also recognizes the importance of the infrastructure of the NNSA and the need to ensure that the infrastructure is capable in all aspects of maintaining the stockpile in the absence of nuclear weapons testing.

Over the past 2 years your agency has started to make progress in addressing the needs of its facilities and infrastructure. Dr. Beckner, we look forward to addressing these issues with you and Mr. Erickson. You have both submitted prepared written statements which will be part of the record.

Now let me turn to Senator Allard and ask for any opening comments he might have.

Senator ALLARD. Thank you, Mr. Chairman. I would also like to welcome our second panel of witnesses, Mr. Erickson and Dr. Beckner.

Let me briefly mention my interest in making sure the weapons activities within the National Nuclear Security Administration are receiving the focus and leadership they require to make sure our nuclear weapons are safe, secure, and reliable, now and in the future. With an aging infrastructure and an aging work force, we need to make sure we are putting resources into our nuclear weapons program to make sure we continue to attract the best and the brightest and that they have the necessary facilities to conduct their important work for our Nation's security.

I look forward to hearing from our witnesses. Included in your testimony I hope you will discuss NNSA's plans for a Modern Pit Facility (MPF). As mentioned in the recently released third Foster panel report, they mention the future years budget commitment for a full-scale pit production facility is still in doubt. The Foster panel report went on to urge that the Nuclear Weapons Council, NNSA, and DOD should establish a requirement that NNSA expeditiously produce an approved design, make a site decision, complete safety studies, and obtain environmental permits for pit production and secondary production facilities.

It appears to me that we should at least be moving out with an initial conceptual plan to determine some of the technical obstacles for such a facility and the best options.

Thank you, Mr. Chairman. I look forward to hearing from our witnesses.

Senator REED. Thank you very much.

Dr. Beckner.

STATEMENT OF EVERET H. BECKNER, PH.D., DEPUTY ADMINISTRATOR FOR DEFENSE PROGRAMS, NATIONAL NUCLEAR SECURITY ADMINISTRATION

Dr. BECKNER. Thank you. I am pleased to be here this afternoon. I am deeply appreciative of your support. The work of the subcommittee is gratifying for the thousands of men and women across the country who have dedicated their professional lives to making the Stockpile Stewardship Program a success. We recognize the importance of this, as do you.

As I said in my confirmation hearing, I believe in systems analysis and using the best information available to find the right solu-

tions, not by intuition or accommodation, but by hard-headed analysis. That is what we are doing with all the elements of the stewardship program.

Stockpile Stewardship is delivering results today. America's nuclear deterrent remains safe, secure, and reliable. Since the end of underground testing, using the tools of stewardship we have successfully certified the B61–11 and we have recertified several warheads with components that have been modified, replaced, or in some cases redesigned.

A number of problems uncovered by the surveillance program have been solved without recourse to nuclear testing. The President's fiscal year 2003 budget will allow us to invest the resources and the tools and experimental capabilities that we must have in the future to deliver on our commitments to our customers, the Department of Defense, and the citizens of the United States.

This afternoon I will talk about several stewardship programs that are of particular interest to this subcommittee and ones that I focus on regularly. First and most important are the life extension programs for the W87, the W76, the W80, and the B61. Second, W88 pit manufacturing and certification at Los Alamos and our planning for a Modern Pit Facility. Third, enhanced test readiness. Fourth, the advanced strategic computing initiative. Fifth, the NIF under construction at the Lawrence Livermore National Laboratory. Finally, the commercial light water reactor program and the production of tritium to support the stockpile.

First let us talk about getting work done. The men and women of the Stockpile Stewardship Program continue to meet their formidable day-to-day challenges with ingenuity and innovation, both in the way we do science, and in the way we organize the work we do. Without the critical work of our stockpile stewards at the labs, plants, and in the Federal structure, we could not perform our mission. Our people remain our number one resource that must be carefully attended now and into the future.

To that end, the NNSA must and is working to improve the infrastructure across the complex. This subcommittee has heard and seen firsthand some of the antiquated working conditions we ask our people to work in. The $242 million in the President's budget for this year for the Facilities and Infrastructure initiative will begin to correct this problem. You will hear more about that from Mr. Erickson. This will have a direct impact on worker morale and productivity.

On the life extension program: As members of this subcommittee are well aware, the NNSA labs and plants have a validated requirement from the Nuclear Weapons Council to extend the service life of the W87, the W76, the W80, and the B61. These requirements were, if you will, revalidated by the Nuclear Posture Review, which lays out the direction for this Nation's nuclear forces for the next 5 to 10 years.

Life extension work involves all the elements of the weapons complex. For the last several years we have been extending the life of the W87 warhead for the Air Force. This work is ongoing at Y–12, Lawrence Livermore, Sandia, and Pantex. We are more than halfway through this effort and expect to wrap up the work by late 2004.

Life extension for the W76 involves a comprehensive overhaul of the warhead, including replacement of the arming, fusing, and firing set. We will also be requalifying the weapon primary. For the W80 we will be replacing the trajectory sensing signal and the neutron generators, the tritium bottles, and incorporating surety upgrades. For the B61 we will be refurbishing the secondary.

These life extension programs will ensure that these weapons will remain safe, secure, and reliable in the U.S. nuclear arsenal for the additional 30 years once the work is complete.

Over the last several years the NNSA has been implementing a pit manufacturing and certification program to restore the capability of the U.S. to manufacture and certify this critical component without nuclear testing. This project is a pivotal challenge to the Stockpile Stewardship Program. I am pleased with the high level of management attention this program continues to receive at Los Alamos and the progress made in meeting this important national security objective. We remain on track to deliver a certifiable W88 pit in fiscal year 2003. Headquarters and Los Alamos staffs have been able to accelerate the date for a certified pit to fiscal year 2007 from fiscal year 2009, which I believe was the date given you last year, resulting in a savings for the taxpayers.

While the Los Alamos facility, TA–55, for making W88 pits is adequate for the task at hand, it lacks the capacity and flexibility to manufacture pits in sufficient quantities to support the entire stockpile. So the NNSA is working on a longer-term solution. We have a project team in place that has undertaken the required preconceptual planning work. During this phase we are carefully examining a number of issues, including technology development to ensure that the facility will meet both current and future requirements to fabricate replacement pits for the current nuclear stockpile or pits for new designs if required.

Our next decision point for the Modern Pit Facility will be later this month, at which time we will decide on proceeding to conceptual design.

As members of this subcommittee are well aware, the NNSA is maintaining a capability to conduct an underground nuclear test within 24 to 36 months based on existing presidential direction. The Nuclear Posture Review, however, raised several concerns about our test readiness posture, which we are addressing in a study to be completed later this spring.

DOD and NNSA will work together to refine nuclear test scenarios and evaluate cost-benefit tradeoffs in order to determine, implement, and sustain the optimum test readiness time to support the policies of the Nuclear Posture Review.

The President's fiscal year 2003 budget has requested an additional $15 million to implement the results of the aforementioned study once the administration determines the best path forward. We will of course keep Congress fully informed on this important national security activity as we proceed.

The ASCI program, working with America's leading computer manufacturers, is developing the three-dimensional simulation capabilities based on advanced weapons codes and high-performance computing that the Stockpile Stewardship Program needs to support stockpile refurbishment activities and other analyses. The

supercomputers at all three weapons labs are fully utilized to meet the needs of the scientists and engineers. Later this year we will bring on line our newest machine, a 30 TeraOps machine, at Los Alamos.

One of the most important science and engineering programs we have in the program is the NIF. I know that this subcommittee has been a strong supporter of the NIF and we are grateful for that support. In 2002 the NIF team at Lawrence Livermore is continuing to make steady progress toward its milestones. We have recently reported to the committee and others that several important milestones were met on or ahead of schedule, including completion of conventional construction and positioning in seismic tiedown of the target chamber.

The program remains on track to begin stewardship experiments in 2004 with 8 beams and by the time 192 laser beams are brought up in 2008 we will have conducted some 1,500 stewardship experiments.

We are continuing to make progress in establishing the new source of tritium. We have in place a multiyear contract with the Tennessee Valley Authority (TVA) to provide irradiation services. We expect the Nuclear Regulatory Commission (NRC) will grant license amendments this fall to the TVA reactors, Watts Bar and Sequoyah, that will be used for tritium production. Commercial vendors across the country are manufacturing parts for the tritium-producing rods that will go into the reactors in fiscal year 2004.

I am concerned, however, with the TEF at Savannah River. While construction of the civil and structural portion of the tritium extraction facility is well along, it is several months behind schedule. In addition, the bids on the rest of the plant contract were well above the baseline estimate.

As a result of these and other factors, we are carefully reviewing and revising our cost and schedule estimates for completion of the facility. We will be coming to Congress with a new baseline in a reprogramming package later this spring.

Mr. Chairman, I know that Congress wants less bureaucracy and more output from this program, with fewer problems along the way. You want a program output that enhances security, which maintains and enhances the safety, reliability, and performance of the nuclear stockpile, and which bolsters U.S. leadership in science and technology. I am convinced that the management reforms that the NNSA is implementing will address your first concern. I am also convinced that the stewardship program is today ensuring that America's nuclear deterrent is safe, secure, and reliable. Of equal importance, the science and engineering campaigns of stewardship are advancing the frontiers of science and technology to help the country meet the economic and security challenges of this new millennium.

Thank you.

[The prepared statement of Dr. Beckner follows:]

PREPARED STATEMENT BY DR. EVERET H. BECKNER

Thank you for the opportunity to appear today to discuss the fiscal year 2003 President's budget request for the National Nuclear Security Administration (NNSA) with a focus on our weapons work and the budget needed to ensure that we can meet our commitment to provide the Nation with a safe, secure, and reliable

stockpile. The fiscal year 2003 NNSA budget request for Defense Programs weapons activities totals $5.11 billion, representing an increase of $305 million over the fiscal year 2002 enacted appropriation, which includes $25 million supplemental appropriation for the Secure Transportation Asset. I would like to begin my testimony here today by setting a policy framework and discussing the issues faced by NNSA.

TRANSFORMING THE NATIONAL SECURITY STRATEGY

President Bush is transforming U.S. national security strategy to meet the threats of the 21st century. The NNSA is intimately involved in the formulation of the administration strategy through participation in the Strategic Review and Nuclear Posture Review. We responded swiftly and comprehensively to the terrorist events of September 11, protecting our valuable national security assets and employees, and offering our unique capabilities to the national response. We have contributed directly to the homeland security needs of Governor Ridge with our technology and scientific staff. Work such as this will extend into fiscal year 2003 and beyond.

While the policies and priorities established by the President, the Secretary, and Congress will determine the scope of our work over the years to come, nuclear deterrence remains the cornerstone of our national defense strategy. The NNSA will make significant contributions to the administration's new capabilities-based national security strategy that requires us to maintain our military advantages in key areas while developing new capabilities.

The NNSA faces major challenges during the next 5-year period in responding to evolving customer requirements while maintaining and improving the health of the Nation's national security enterprise. The expanded focus on international terrorism following the September 11 attacks underscores the importance of maintaining a strong capability in the science and technology of national security.

NNSA's ability to perform its national security functions depends upon revitalizing our scientific and engineering expertise to ensure the reliability, safety, and security of the Nation's nuclear weapons. Much of the physical and intellectual infrastructure of the national security enterprise was built during the era of underground nuclear testing, and has eroded to the point that we are no longer able to perform some essential tasks. It is imperative that we address these issues during the upcoming 5-year period. NNSA's program and budget planning emphasizes maintaining an adequate workforce of scientific, technical and business skills, and building a diverse, multi-talented leadership. We must be able to recruit, train, and develop highly skilled employees throughout our organizations in a highly competitive employment environment. We must implement our plans to renew the physical infrastructure to ensure adequate capability and capacity, as well as compliance with environment, safety, health and security standards.

Another key element to NNSA's ability to perform its national security functions is an organizational plan to achieve greater effectiveness and efficiency. On February 25, NNSA submitted its "Report to Congress on the Organization and Operations of the NNSA" describing our accomplishments to date and our strategy for operating an integrated national security enterprise.

BUDGET SUMMARY

By way of summary, the NNSA fiscal year 2003 request supports the recommendations from the Nuclear Posture Review to assure the continued safety, security, and reliability of the stockpile without underground nuclear testing, develop a stockpile surveillance engineering base, refurbish and extend the lives of selected warheads, and maintain the science and technology base needed to support nuclear weapons. The request protects the operational readiness of the nuclear weapons stockpile through surveillance, experiments, and simulations for individual weapons and weapon systems, and investment in advanced scientific and manufacturing for the future.

The President's fiscal year 2003 budget request for Defense Programs was developed based on two primary resource drivers. First, the strategic reviews of national security-related activities conducted this past year. The NNSA actively participated in the President's strategic review of deterrence and missile defense policy and was a key participant in the NPR which lays out the direction for this Nation's nuclear forces over the next 5 to 10 years. These reviews reaffirmed NNSA's stockpile refurbishments and the need for a robust, responsive research and development and industrial base of which the nuclear weapons enterprise is a key element. The NNSA laboratories are on the cutting edge of technology and have a vital national security role to play in combating terrorism. The other is the President's Management Initiatives on the human capital management and competitive sourcing initiatives which serve to focus our fiscal year 2003 activities, particularly in the NNSA restructuring

of the headquarters and field offices and in the Federal program direction budget. Recruitment, retention, and skill mix are critical to NNSA's success in the future and are key to our plans for re-engineering the workforce.

STOCKPILE STEWARDSHIP

In spite of the many challenges we are facing, the NNSA has continued to meet the core stockpile stewardship mission—that is, to maintain the safety, security, and reliability of the nuclear stockpile to meet national security requirements.

As I stated earlier, the NNSA actively participated in the strategic reviews of national security related activities conducted by the administration. Participation by NNSA ensured that the choices, plans, and requirements being developed were within the realm of the technical and production capabilities of the NNSA. It also increased the awareness of our issues and technical capabilities within the administration's national security senior management team.

While there are many important points and conclusions in the NPR including the goals to reduce operationally deployed strategic nuclear weapons to between 1,700 and 2,200 by calendar year 2012 and the maintenance of a "responsive force" for use as a hedge against unforeseen problems, several points are of particular relevance to the NNSA.

First, nuclear weapons, for the foreseeable future, remain a key element of U.S. national security strategy. The NPR reaffirms that NNSA's science-based Stockpile Stewardship Program is necessary to ensure the safety and reliability of the nuclear stockpile in the absence of nuclear testing. This includes surveillance of our aging weapons, weapon refurbishment, chemistry and metallurgy of materials aging, detailed understanding of weapons physics, reestablishment of warhead advanced concepts teams, and development of additional diagnostic and predictive tools for long-term stewardship. The NPR revalidated the stockpile refurbishment plan previously developed and approved by the NNSA and the Department of Defense. The fiscal year 2003 budget request for Directed Stockpile Work is $1.2 billion, an increase of $190 million, or about 18 percent over last year. Principally, this increase allows us to support life extension activities for the W80, W76, and B61 warheads, including supporting research and development and additional hydrodynamic testing for assessment and certification. Also, $2.1 billion is requested for the 16 scientific and engineering campaigns that provide the knowledge, technologies, and capabilities to address current and future stockpile issues.

Second, more than any previous review, the NPR's concept of a new triad emphasizes the importance of a robust, responsive research and development and industrial base. This calls for a modernized nuclear weapons complex, including contingency planning for a Modern Pit Facility, which would provide the Nation with the means to respond to new, unexpected, or emerging threats in a timely manner. The fiscal year 2003 budget request supports our industrial base through a request of $1.7 billion for Readiness in Technical Base and Facilities, a 10-percent increase supporting the operations of weapons complex facilities. In addition, the NNSA has requested $243 million for the Facilities and Infrastructure Recapitalization program to continue this important multiyear initiative into its third year. This program is managed by Mr. Ralph Erickson who serves as the Associate Administrator for Facilities and Operations.

Third, a study examining the aspects of reducing test readiness lead time below the existing 24- to 36-month requirement for a fully diagnosed test. The NPR states that the lead time needs to be shortened out of prudence, not because there is a current need to test. In fiscal year 2002, the NNSA and the DOD will study the optimum test readiness time that best supports the new triad, as directed by the NPR. Pending the outcome of the study, the fiscal year 2003 request includes $15 million for Enhanced Test Readiness activities at the Nevada Test Site.

It is NNSA's judgment, at this time, that a resumption of underground nuclear testing is unnecessary, because stockpile stewardship is working and is on track to deliver scientific tools needed for certification into the future. Since the end of underground testing, the U.S. successfully certified the B61–11 and has recertified several warheads with components that have been modified, replaced, or in some cases redesigned. A number of problems uncovered by the surveillance program have been solved without recourse to nuclear testing.

The NPR calls for increased emphasis on the reducing the time required for a nuclear test, if directed by the President at some future date. This may call for NNSA contractors to recruit and train new staff to become skilled to support fielding and performing nuclear experiments and or tests. Additionally, NNSA would acquire specific long-lead-time equipment needed for testing, such as field-test neutron generators and certain test diagnostic equipment. Another important aspect of enhanc-

ing test readiness is to revise testing procedures to make them compliant with current safety and environmental regulations. Finally, high-fidelity field exercises would be conducted to demonstrate the ability to field a nuclear test.

The NPR states that the number, composition, and character of the Nation's nuclear forces ought to reflect the reality that the Cold War is over and that required capabilities may now need to be different. For example, current weapons in the stockpile cannot hold at risk a growing category of potential targets deeply buried in tunnel facilities, possibly containing chemical, biological, nuclear, or command and control facilities. As a result the NPR endorsed NNSA's Advanced Concepts Initiative that could provide the Nation with options that could be considered for future production and deployment. Also, as required by the NPR, it would provide an opportunity for NNSA and its contractors to exercise critical skills necessary for the long-term sustainment of the Nation's defense.

By direction of the Nuclear Weapons Council, and in response to an Air Force requirement, the initial focus of the Advanced Concepts Program will be the Robust Nuclear Earth Penetrator (RNEP), for which $15.5 million is requested in fiscal year 2003 as part of the Directed Stockpile Research and Development activity. The 3-year RNEP Feasibility Study will assess the feasibility of modifying one of two candidate nuclear weapons currently in the stockpile to provide enhanced penetration capability into hard rock geologies and develop out-year costs for the subsequent production phases, if a decision is made by the Nuclear Weapons Council to proceed. This work complies with existing legislation, including Section 3136 of the Fiscal Year 1994 National Defense Authorization Act. The fiscal year 2003 budget contains no other funds for Phase 6.X advanced concept study activities.

Finally, the NPR calls for a stable, adequately funded FYNSP. The NNSA's costs will not be reduced in the immediate future as a result of NPR, since near-term costs are driven by restoring production capabilities and revitalizing the infrastructure, not by the number of warheads in the stockpile or even the number to be refurbished. However, we do expect that cost savings from refurbishment of a smaller number of weapons will be realized beginning about fiscal year 2010. Also, workload analysis shows that the NNSA enterprise's capacity will be stretched, approaching maximum capacity while our systems are on the process line for refurbishment, thereby limiting our ability to dismantle significant numbers of weapons over the next 10 years. The FYNSP for the NNSA was provided to Congress on March 26, 2002.

A less obvious, but significant result of the NPR is the improved cooperation and coordination between the NNSA and DOD. The Nuclear Weapons Council is working, policy levels between the agencies are effective, and the DOD has offered strong support for needed programs in NNSA.

I would now like to turn to several specific programs that make up the Stockpile Stewardship Program. The success of these programs will be central to our ability to continue to support and certify the stockpile in the years to come.

STOCKPILE LIFE EXTENSION PROGRAM

Our most important responsibility is to deliver on our commitments to our customer, the Department of Defense. The NNSA has a validated requirement from the Nuclear Weapons Council (NWC) to extend the service life of the W87, W76, W80, and B61. This requirement was revalidated by the recently completed Nuclear Posture Review. The life extension work will involve the entire weapons complex. The Kansas City Plant will manufacture the non-nuclear components; Y–12 National Security Complex will refurbish the secondaries; Savannah River Tritium Facility will supply the gas transfer systems; Sandia National Laboratory will produce the neutron generators and certify all non-nuclear components. Pantex Plant will serve as the central point for all assembly and disassembly operations in support of the refurbishment work. Los Alamos and Lawrence Livermore will continue to certify the nuclear package.

W87

The life extension program on the W87 warhead was authorized by the NWC in fiscal year 1994. The program achieved First Production Unit (FPU) in the second quarter of fiscal year 1999. The ongoing work at Pantex enhances the structural rigidity of the warhead and is increasing the service life by 30 years. The warhead will be mated to the Minuteman III missile following deactivation of the Peacekeeper missile. The NWC accepted the refurbished W87 as a standard stockpile item in the first quarter of fiscal year 2002. NNSA has completed work on over half of the W87 inventory and the remaining W87 stockpile will be refurbished by the first quarter of fiscal year 2004

W76

The NWC approved the Block 1 refurbishment plan for the W76 in March 2000. The Block 1 refurbishment of the warhead (about one quarter of all W76 warheads) will focus on the high explosive, detonators, organic materials, cables and addition of a new Acorn gas transfer system. The Block 1 refurbishment will also add a new arming firing and fusing (AF&F) system. The FPU of Block 1 will be available by the end of fiscal year 2007, and Block 1 production is planned for completion in fiscal year 2012. During the Block 1 production, a decision will be made to either continue Block 1 retrofits on the entire W76 stockpile, change to a Block 2 retrofit that could include other options, or stop the retrofit altogether. The Block 2 effort, if approved by the NWC, would continue from fiscal year 2012 to fiscal year 2022 to refurbish the remaining W76 warheads.

W80

The NWC approved the refurbishment of the W80 in the beginning of fiscal year 2001. The Block 1 refurbishment of the warhead (about one third of the warheads in the stockpile) will focus on replacing the current gas transfer system with an Acorn design, new neutron generators, redesign of the warhead electrical system, addition of improved surety features and replacement of other associated components. The need to perform refurbishment work is driven by several factors including: age related effects that must be addressed to ensure the continued performance of the warhead, minimizing weapon movements between DOD and DOE, and infrastructure and capacities issues within the weapons complex. The FPU of the Block 1 design will be available in the second quarter of fiscal year 2006, and Block 1 production is scheduled for completion in fiscal year 2010. During the Block 1 production, a decision will be made to either continue Block 1 retrofits on the entire W80 stockpile, change to a Block 2 retrofit that could include enhanced surety options, or stop the retrofit altogether. The Block 2 effort, if approved by the NWC, would continue from fiscal year 2011 to fiscal year 2017 to refurbish the remaining W80 warheads.

B61–7/11

NNSA and DOD are working to identify refurbishment options for the aging B61–7/11 Canned Subassembly (CSA) and associated cables, connectors, some limited life components, and foam components. The study effort is expected to be completed in late fiscal year 2002. Development Engineering will begin following Nuclear Weapons Council approval in late fiscal year 2002. This program will use systems engineering approaches, and the planned FPU of the refurbished B61–7/11 will be in the third quarter of fiscal year 2006. Production of these refurbished CSAs is scheduled to continue to the end of fiscal year 2008. The plan also calls for some selective non-destructive evaluation (NDE) and screening of CSAs as a risk mitigation effort for other warheads during fiscal year 2003 and fiscal year 2004.

I would like to note that, for the first time in a number of years, weapons systems cost data is included in the fiscal year 2003 budget request, as requested in the conference report accompanying the fiscal year 2002 Energy and Water Development Appropriations Act (107–66). The weapons systems cost data for fiscal year 2003 are provided in the Directed Stockpile Work section of the budget. In addition, we have resumed reporting for nuclear weapons acquisition costs for weapons systems in Phase 6.3 and beyond (W87, W76, and W80 Life Extension Programs) in a separate, classified document.

PIT MANUFACTURING AND CERTIFICATION CAMPAIGN

The reestablishment of a plutonium pit manufacturing capability, a capability that the United States has not had since the cessation of manufacturing at the Rocky Flats Plant in 1989, is a key national security challenge that the NNSA must meet. The W88 pit is a primary focus of NNSA's pit campaign because an insufficient number of W88 pits were produced to support pit surveillance activities prior to the closure of Rocky Flats.

The Pit Manufacturing and Certification Campaign is focused on the near-term development of manufacturing processes at Los Alamos and a certification methodology applicable to the W88 pit, with a long range goal of reestablishing the capability to manufacture all pit types within the stockpile. The program remains on track to deliver a certifiable W88 pit in fiscal year 2003. Over the last year Headquarters and Los Alamos staffs have worked aggressively and have been able to accelerate the date for a certified pit to fiscal year 2007. The Pit Manufacturing and Certification Campaign budget request for fiscal year 2003 is $194 million.

Program accomplishments in fiscal year 2001 include:

- Accelerated the certification date for a manufactured W88 war reserve pit from fiscal year 2009 to fiscal year 2007.
- Manufactured three development and three standard W88 pits in fiscal year 2001; one of the development pits was completed more than a year ahead of schedule.
- Projectized W88 activities are on-track, with all major milestones for fiscal year 2001 accomplished.
- Reorganized W88 Pit Manufacturing and Certification Activity at Los Alamos to increase management attention and resources on the project.
- Provided documentation required to support a fiscal year 2002 decision on Mission Need for a Modern Pit Facility.

The fiscal year 2003 budget will allow the program to:

- Manufacture a development pit and the first certifiable pit in fiscal year 2003.
- Conduct two integrated physics tests and pit engineering tests in fiscal year 2003.
- Establish production controls and quality infrastructure in fiscal year 2003 to support the manufacture of the first certifiable pit in fiscal year 2003.
- Establish and implement a peer process that includes at least one technical data exchange between Los Alamos and Lawrence Livermore National Laboratory in fiscal year 2003.

While the Los Alamos facility (TA–55) for making W88 pits is adequate for the task at hand, it lacks the capacity and flexibility to manufacture pits in sufficient quantity to support the NPR requirements. Therefore, the NNSA is working on a longer term solution for a modern pit manufacturing facility. A project team is in place and has undertaken the required preconceptual planning work. During this phase we will carefully examine a number of issues, including technology development to ensure that the facility will meet both current and future requirements. NNSA's next decision point for the Modern Pit Facility will be later this spring when we will decide on whether to proceed with conceptual design.

TRITIUM CAMPAIGN

In addition to restoring the Nation's ability to manufacture plutonium pits, the NNSA is proceeding with plans for producing new tritium to support the stockpile. Tritium is a radioactive isotope of hydrogen which decays at a rate of about 5 percent per year. All weapons in the stockpile must have tritium to function as designed. The United States has not manufactured new tritium since 1988 and has been relying on recycled tritium from retired weapons to meet stockpile requirements. To manufacture new tritium, the Tennessee Valley Authority (TVA) will be irradiating tritium producing burnable absorber rods (TPBARS) in the Watts Bar and Sequoyah 2 reactors. Irradiation of the TPBARS remains on schedule for the fall of 2003. The rods will remain in the reactors throughout the plants' normal 18-month operating cycles. The fiscal year 2003 request for the tritium campaign totals $126.2 million.

In order to irradiate tritium-producing rods, the TVA reactors must have approval from the Nuclear Regulatory Commission. The TVA submitted formal requests in August-September 2001 asking that the reactors' operating licenses be amended to permit tritium production. In December 2001 the Nuclear Regulatory Commission published a Federal Register notice proposing to issue a "no significant hazards consideration determination", which means that the Nuclear Regulatory Commission can issue the license amendments without first holding hearings. We expect that the Commission will issue the license amendments by this fall.

While the recent Nuclear Posture Review reduces the number of active, deployed nuclear weapons, it also requires that NNSA support a responsive reserve of warheads. This support would include maintenance of tritium inventories for the reserve. When all these factors are considered, the impact is small on the date when new tritium will be needed.

While the civil/structural portion of the Tritium Extraction Facility is well along, it is several months behind schedule. In addition, the bids on the rest-of-plant (installation of all the equipment) contract came in well above the baseline estimate. As a result of these and other factors, NNSA is currently reviewing and revising the cost and schedule baselines for the facility. We expect to be coming to Congress with a reprogramming letter following the completion of these cost and schedule reviews. We have asked the Department's Inspector General to review this program

and ensure that we have taken all the necessary corrective actions to get this program back on track. We are still aiming for its completion in fiscal year 2006.

ADVANCED SIMULATION AND COMPUTING CAMPAIGN

The Advanced Simulation and Computing (ASCI) campaign is developing the simulation capabilities, based on advanced weapon codes and high-performance computing, that incorporate high-fidelity scientific models validated against experimental results, past tests, and theory. The fiscal year 2003 budget request for the ASCI campaign is $725 million, which includes $55 million for line-item construction projects at LLNL and SNL. This is an increase of $8 million from fiscal year 2002.

The long-term ASCI objective is to provide the validated three-dimensional, high-fidelity physics, full system simulation codes required for engineering, safety, and performance analysis of the stockpile and to develop the computing resources with sufficient power (speed, memory, and storage capacity) to support stockpile analyses.

The schedule for developing three-dimensional weapons simulation capabilities is tightly integrated with the certification of the refurbished W87, W76, W80, and B61 warheads. Requirements for predictive weapons simulations determine the acquisition strategy for increased computing capability and capacity. University partnerships have also been developed through five Alliance Centers at leading research universities.

Program accomplishments in fiscal year 2001 include:

- Three dimensional simulations of key mechanical responses of a re-entry vehicle system to normal flight environments, and of the performance of a full weapons system. Being able to simulate a complete weapon system allows laboratory researchers to examine key physics issues through a combination of simulation, precision experiments, and analysis of data from past nuclear tests. These codes are playing a major role in the plans for the remanufacture of the W76 AF&F.
- Completion of the Strategic Computing Complex at Los Alamos National Laboratory in December 2001 provides the facilities necessary to accommodate the 30-TeraOps Q supercomputer. The Q machine is now being delivered to Los Alamos. We expect to have the first portion of the machine running by June 2002 and the full system will be running by the end of the 2002.
- A comprehensive external review of all five Alliance Level 1 Centers was completed in October 2001. Accomplishments include the development of scalable, multi-physics codes, successful advanced degree programs and graduates, as well as world-class science measured through peer-reviewed publications.

The fiscal year 2003 budget will allow the program to:

- Release enhanced ASCI 2–D primary design capability,
- Demonstrate three-dimensional safety simulation of a complex, abnormal explosive-initiation scenario,
- Demonstrate three-dimensional coupled electrical response of a weapon system in hostile (nuclear) environments.

HIGH-ENERGY-DENSITY PHYSICS

The High Energy Density Physics Campaign advances U.S. capabilities to achieve high-energy-density physics (HEDP) conditions, including inertial confinement fusion ignition and thermonuclear burn in a laboratory setting, to support Stockpile Stewardship Program science and engineering requirements. The capability to achieve physical conditions nearing those produced during nuclear weapons detonations, including extremely high temperatures and pressures, is critical for conducting experiments to verify physics theory underlying nuclear weapons design code predictions, to validate advanced computer models being developed for stockpile stewardship, and to more accurately characterize the performance of materials exposed to a nuclear environment.

The fiscal year 2003 budget request for HEDP is $452 million, which includes $215 million for NIF line-item construction and $76 million for NIF Demonstration and Operations. These funds will maintain the NIF project schedule. Because of overall NNSA budget priorities, only $161 million is requested for the HEDP Core Research and Operations account. This is a reduction of $26 million, which will delay some long-term aspects of the NIF experimental program including progress toward ignition. However, our assessment of program impacts across all budget elements indicates that this is a necessary decision this year.

The program is carried out at the three weapons laboratories as well as the laboratory for Laser Energetics (LLE) at the University of Rochester, and the Naval Research Laboratory (NRL). Existing major facilities for conducting HEDP research are the OMEGA laser at LLE, and the Z pulsed-power facility at SNL, the Trident laser at LANL, and the Nike laser at NRL.

The most important new facility for the HEDP is the NIF, under construction at LLNL. NIF will provide the capability for weapons scientists to undertake experiments to address high-energy and fusion aspects that are important to the primaries and secondaries of nuclear weapons. Several important milestones for the NIF program were met on, or ahead of, schedule, including completion of conventional construction and positioning and seismic tie down of the target chamber. The program remains on track to begin stewardship experiments in 2004 with 8 beams, and by the time all 192 lasers beams are brought up in 2008, some 1,500 stewardship experiments will have been performed on this important, one-of-a-kind tool.

The fiscal year 2003 budget will allow the program to:

- Operate the NIF Optics Assembly Building,
- Demonstrate multiframe backlighting capability on Z,
- Install the NIF target positioner in support of first light to the target chamber center and start of stewardship experiments in fiscal year 2004,
- Utilize radiation transport experiments on Z and OMEGA for validation of specific aspects of Advanced Simulation and Computing (ASCI) radiation transport and hydrodynamics modeling, and
- Demonstrate filling of prototype NIF indirect-drive ignition capsules and quantify key characteristics.

NNSA ORGANIZATION STANDUP

NNSA's organizational objectives are to improve effectiveness and efficiency. We approached the NNSA organization standup by implementing a two-phase plan. The first phase, essentially complete, focused on creating an integrated headquarters organization, and defining the structural relationship between the Federal elements at headquarters and the field locations. The second phase focuses on realigning our field structure and improving efficiencies by eliminating overlaps in responsibilities within the Federal structure and reducing unnecessary administrative burdens placed on those performing the mission.

The recently released report summarizes our first-ever NNSA Strategic Plan, provides a detailed plan for assigning roles and responsibilities between headquarters and field elements, and discusses our objectives for fiscal year 2002 and beyond. We will eliminate a layer of management and oversight over the nuclear weapons complex by removing the Operations Offices from the NNSA chain of command and converting these offices to service centers that provide support services such as procurement and human resources. Each of the eight NNSA M&O contractors will report to its respective site offices which will, in turn, report to the Administrator. This locates NNSA support, decision making, and oversight close to the contractor, consolidates service functions, and allows staff reductions downstream.

Local contract and project management will rest with each NNSA site office. Integration of weapons production activities will be performed for headquarters from the Albuquerque, New Mexico NNSA office. Headquarters staff will continue to be responsible for program planning, budgeting, policy development, and management of weapons research and development and nonproliferation activities.

NNSA will launch a systematic re-engineering effort to reduce the number of separate offices and layers of Federal management, reduce the overall number of Federal employees, and identify and correct skills mismatches. Federal staff not performing core functions will be redeployed and retrained as necessary. We intend to use incentives to encourage higher-than-average attrition, career development, and retention of highly skilled employees to right size and reinvigorate our staff.

NNSA has instituted an Administrative Workload Reduction Initiative using comprehensive input from the laboratories and plants, with task forces identifying specific improvements and reducing administrative burdens. As a result, NNSA contractors will be given clearer and more consistent responsibilities and authorities. They will also continue to comply with all environment, safety, health, and security policies.

When these changes are fully implemented, we will realize the goals set by Congress in establishing the NNSA. By clearly defining roles and responsibilities, we will increase accountability and reduce duplication. By reducing administrative burdens on the NNSA contractors, we will operate more effectively and efficiently.

CONCLUSION

This concludes my written testimony on the policy framework and issues that shaped the formulation of the unified NNSA budget request for fiscal year 2003. The continuing support of this committee and the entire Congress is essential as this program continues to move forward. Additional information on all aspects of the Stockpile Stewardship Program are contained in the fiscal year 2003 budget request, the Future Years National Security Program, and the classified Nuclear Weapon Acquisition Reports which have been provided to Congress. Now, I will be pleased to answer your questions.

Senator REED. Thank you very much, Dr. Beckner.

Mr. Erickson.

STATEMENT OF RALPH E. ERICKSON, ASSOCIATE ADMINISTRATOR FOR FACILITIES AND OPERATIONS, NATIONAL NUCLEAR SECURITY ADMINISTRATION

Mr. ERICKSON. Good afternoon, Mr. Chairman, members of the subcommittee. I appreciate the opportunity to appear before you to discuss the facilities and operations organizations and the facilities infrastructure recapitalization program.

A year ago General Gordon, the Administrator of the National Nuclear Security Administration, described the condition of the nuclear weapons complex during testimony before this subcommittee. He said then: "What I found, I must confess, was remarkable. Almost half of our structures are over 50 years old, old in the sense of safety, security, reliability, and mission effectiveness. Many facilities do not meet modern health, environmental, or energy conservation standards."

I am here to say I strongly support that view and have been asked by General Gordon to remedy that situation. The priorities in the nuclear weapons complex are being refocused to assure a viable production and laboratory capability while meeting the mission requirements of our customer. The Office of Facilities and Operations has been established to ensure the vitality and the readiness of the nuclear security enterprise.

We have wide-ranging responsibilities to focus attention on the physical assets of the nuclear weapons complex. Some of these responsibilities include institutionalizing professional and accountable corporate facilities management activities, setting policy and guidance for facilities management, and assessing the implementation of that policy, advocating the programs provide appropriate resources to restore the infrastructure of the complex, and developing and managing the facilities and infrastructure recapitalization program.

In the facilities and operations organization, NNSA established the Office of Infrastructure and Facilities Management to oversee the implementation of corporate facilities management and act as the program manager for recapitalization activities. Bruce Scott, the Director, is a seasoned, experienced leader with a proven track record. I have tasked him directly with the responsibility to establish the proper level of resources necessary to restore the complex to a condition that supports the Stockpile Stewardship Program.

His staff represents some of the finest facilities professionals we have across the complex, that have significant weapons program knowledge. This staff clearly understands the role of its mission to

assure a nuclear weapons complex of acceptable capability and capacity.

Responsible corporate facilities management within the NNSA is built upon proven industry practices, successful facilities programs throughout the government, academia, and the private sector. This together with my position as an equal member of the NNSA Management Council ensures that the decisions made concerning the physical requirements of the complex are founded in fact, with the understanding and agreement of the risks and benefits, so that we truly are managing our $25 billion physical plant as one corporate enterprise.

I will now address the specific program created to help assure the long-term health of the enterprise. The facilities and infrastructure recapitalization program has been established to ensure that the physical infrastructure of the nuclear weapons complex is restored, rebuilt, and revitalized. The base maintenance and infrastructure is funded within Defense Programs, Readiness, and Technical Base and Facilities (RTBF) activity that Dr. Beckner has touched on. The mission of the RTBF program is to ensure the facilities necessary for immediate programmatic activities are maintained to support that workload. Given the variety of programmatic issues, this funding has not been able to focus on improving the condition of a deteriorating nuclear weapons complex.

Sustained incremental, preventative, and other maintenance and infrastructure investments above this base are needed to extend the facilities' lifetimes, reduce the risk of unplanned system and equipment failures, increase operational efficiency and effectiveness, and allow for recapitalization of aging facility systems.

The program will direct a portion to address an integrated, prioritized list of maintenance and infrastructure activities above current operating levels. That will increase the operational efficiency and effectiveness of the NNSA weapons complex. These activities are intended to increase the operational effectiveness of the entire enterprise and recognize our landlord responsibilities at multi-user sites, such as Lawrence Livermore, Los Alamos, Sandia National Laboratories, the Nevada Test Site, the Kansas City Pantex and Y–12 plants, and the Savannah River tritium facilities.

This program alone will not refurbish the enterprise, but it performs a vital function to help size and complete the set of requirements necessary to restore the enterprise to an acceptable condition. It is key to maintaining the facilities housing the activities conducted in support of the nuclear weapons life extension program.

The facilities infrastructure program has three components: first, recapitalization, which funds projects to significantly improve both facility condition and facility mission availability; second, facility disposition, which provides guidance and resources to dismantle and dispose of excess non-process-contained facilities; and third and just as important, the facility planning, which ensures the requisite planning for the next year's recapitalization and disposition projects are done in a timely and cost-effective manner.

Before addressing the fiscal year 2002 program, I would like to thank the subcommittee for their support of the $8.7 million provided in the fiscal 2001 supplemental appropriation to begin the fa-

cilities and infrastructure recapitalization program. These funds were used to initiate the program, to establish the necessary processes, and basically give us a leg up to be prepared for the larger funding that followed in this fiscal year.

This was followed by the $200 million provided in fiscal year 2002, which was supported by your committee, and we appreciate that. The objective of the 2002 program is to arrest the deterioration of the nuclear weapons complex that is occurring this year. We have identified 81 recapitalization projects costing approximately $137 million. Our program goals this year are to address the areas of failed roofing, to correct urgent atmospheric control, water, and electrical system repairs, and to address a significant level of deferred maintenance activities.

Upgrading and replacing the HVAC systems in central manufacturing and laboratory facilities are in progress. We have begun renovation of mission-essential buildings to permit more effective and efficient operation and consolidation of personnel. We have scheduled 19 planning projects costing approximately $9 million. These are high-priority recapitalization and facilities disposition projects which are scheduled for execution in the following fiscal year.

With regard to facilities disposition, we have begun 33 projects costing approximately $50 million that will eventually reduce the footprint of the NNSA enterprise by some 500,000 square feet.

Looking ahead to fiscal year 2003, we plan to undertake the following: fund the recapitalization at approximately $180 million, which will continue to stabilize the overall condition of the nuclear weapons complex. Projects will be funded from an integrated, prioritized list using the 10-year comprehensive site plans for input from each site.

Planning conducted in fiscal year 2002 will lay the foundation for the recapitalization projects to be executed in 2003. Planning and project preparation completed at this point saves time, money, and effort in the coming year.

Facilities disposition will continue at the same pace as fiscal year 2002, supporting a further footprint reduction by at least another 500,000 square feet of excess facilities.

The NNSA approach to management of its facilities and infrastructure is a corporate one. Dr. Beckner has described the programmatic approach and the use of Readiness and Technical Base and Facilities funding. I have just covered the facilities and infrastructure recapitalization program. He is the line program manager for the sites. I support his program needs. This is a team effort to improve the NNSA Stockpile Stewardship Program.

The path forward: Let me describe it briefly. The various assessments, both ours and independent parties', clearly describe the general long-term financial commitment and management effort required to establish a capable and credible physical complex to continue to support the Stockpile Stewardship Program. These assessments make a strong case for continuation of this program. Our program this year will begin to correct the deteriorations we have seen over the past decade.

Over the next several years we will ensure the stabilization of the condition of the complex and in places actually make a marked improvement. As an example, we need to target significant de-

ferred maintenance backlogs which we have built up over the last decade. This area costs us dearly in current corrective maintenance and threatens unacceptable mission down time. It is NNSA's intent to stabilize our deferred maintenance backlog by fiscal year 2005 and aggressively reduce it to within industry standards by fiscal year 2009.

We want to return our facilities' condition to a level of good to excellent, not where we are today. Likewise, we need to dedicate the resources to maintaining the new facilities that we are bringing on line at the same assessment level. Dr. Beckner has talked about NIF and the other two facilities that currently are in process. We must continue the efforts we have underway to reduce the significant amount of excess facilities.

We owe our work force, which is our most valuable resource, a professional working environment in which to carry out our national security mission. I am convinced this program will be able to execute the foregoing deliverables within the funding levels and the time lines we propose. We will ultimately close out this program by merging it into the core NNSA programmatic components. Given the continued support by this committee, my vision is to complete this activity within the next 15 years.

The most challenging issue facing General Gordon and the NNSA is to maintain your continued support. The NNSA critically assessed itself. The complex was determined to be failing. We have taken responsible actions by citing the problem and providing a reasoned and thoughtful solution. Money, though very important, is not the complete solution. Under General Gordon's leadership, we have refocused our management on the importance of maintaining the weapons complex.

Fiscal visibility and accountability are in place to manage and allocate scarce resources. Close cooperation with the programs serves as a check and balance on proposed project priorities. Metrics are in place to determine our progress. Finally, the merging of all this forms a solid program facilities management.

The nuclear weapons complex is a vital component of our national nuclear security strategy. The NNSA has organized and managed this challenge. Long-term funding support is crucial to our success. We expect to be held accountable.

Thank you for the opportunity to report our progress and make our case for fiscal year 2003 funding. I will be happy to answer any questions that you may have now or for later submission. Thank you.

[The prepared statement of Mr. Erickson follows:]

PREPARED STATEMENT BY RALPH E. ERICKSON

Mr. Chairman, members of the subcommittee, thank you for the opportunity to come before you to discuss the condition of the facilities and infrastructure of our vital nuclear weapons complex. With your support, we have begun the tough, but crucial, road to recovery of the complex. While only in the first stage of a long journey, probably of some 10 years or so, I feel we have a solid story to tell you. Let me explain about the start of the recovery of the nuclear weapons complex, and especially the improved management and accountability with which we are undertaking the recovery.

CONDITION OF THE NUCLEAR WEAPONS COMPLEX

Approximately a year ago, General Gordon, Administrator of the National Nuclear Security Administration, testified before this subcommittee and others describing the condition of the nuclear weapons complex. At that time, he provided his assessment of what he had seen following visits to each site in the nuclear weapons enterprise. Some of his words and findings bear repeating. "What I found, I must confess, was remarkable. Almost half of our structures are over 50 years old—old in the sense of safety, security, reliability, and mission effectiveness. Many facilities do not meet modern health, environmental, or energy conservation standards. They are costly to maintain, and difficult to keep in regulatory compliance. It is in such facilities we ask some of the most brilliant scientific and technical minds and some of the most productive people in the country to work." He added, "The physical complex requires attention and we must act soon, because it is unprofessional, it's inefficient, it's wasteful of resources, it's potentially dangerous, and it sends exactly the wrong message to the professionals we want to attract and keep in this endeavor."

His assessment built upon the findings of studies of which you are aware—all reaching the same conclusions. Defense Programs, in their Facilities and Infrastructure Assessment 2000; and the Foster Panel's February 2001 assessment of the "Reliability, Safety, and Security of the United States Nuclear Stockpile" found that "the nuclear weapons complex is old, the infrastructure, a necessary part of the complex, has been neglected, and is not funded adequately." Specific details focus the concern: maintenance backlog is increasing by well over $100 million a year, and has reached some $700 million; unfunded priority facility requirements are still increasing by about $200 million a year; and, possibly of greatest concern, facility and infrastructure conditions of the complex continue to deteriorate. In 1995, 57 percent of the complex was in an "excellent to good" condition, but by 2000 had deteriorated to only 27 percent. "In addition, facilities management is fragmented, is without uniform standards and in difficult times has served as bill payer for higher priority science and production programs across functional areas." These studies make the clear case that additional funding must be committed annually for at least 10 years to restore, rebuild, and revitalize a very fragile nuclear weapons complex.

The recent Nuclear Posture Review highlighted concerns over the inadequate condition of the nuclear weapons complex in its report to Congress: "A major challenge for nuclear weapons programs over the next two decades will be to refurbish, and thereby extend the life of, at least seven types of warheads. . . . In order to carry out this plan, NNSA has initiated efforts to recapitalize deteriorating facilities (or build entirely new facilities), restore lost production capabilities and modernize others. . . Initiatives to restore the production infrastructure will represent a sustained long-term effort and will be critical to ensuring an effective, balanced stewardship program for the Nation's nuclear deterrent and for the New Triad."

In the final Foster Report, Dr. Foster builds on the NPR finding. He reported to Congress in March 2002, alluding to the decision to conduct "extensive refurbishment in the coming decade" of additional warhead types that "This work entails new materials and production methods and modified designs. It must be done in a weapons complex that has atrophied to a point not fully appreciated by many."

In today's world, irredeemably changed by the horrors inflicted upon our Nation last September, the question of whether a revitalized nuclear weapons complex is worth an investment of this magnitude is self-evident. As long as nuclear weapons remain a component of this Nation's strategic response, then the capability to develop and reliably produce nuclear weapons is critical. A diminished capability and capacity within the physical complex undermines the deterrent value of the weapons programs developed there. This is not just an undermining of the strategic interest of the Nation, it could invite an adversary to either question our resolve or believe in the viability of a nuclear arms race. Dr. Foster's compelling report frames the issue clearly in technical, strategic, and political terms. He concludes, "But we don't have an alternative. We have to maintain the deterrent. It is decaying and has to be replaced."

General Gordon clearly understands that the facilities, infrastructure, maintenance, and recapitalization have been under funded far too long. The priority earlier had been properly given to establishing the Stockpile Stewardship Program. Attention to the infrastructure was put on hold while the science based stewardship program was formulated, funded, has taken hold, and is now working. He recognized in his report to Congress last year that the time had come to refocus on the physical complex, which houses the Stockpile Stewardship Program. Setting the scene for what I will report on today, he gave his commitment to provide the necessary leadership to improve the condition of the complex, "Our facilities require attention. Others have found, as we have, shortcomings, regarding the condition of the com-

plex. Improving the facilities and infrastructure of the NNSA is a high priority, but we need your help, and I am prepared to work with you to this end. I have a detailed plan of how to proceed. Dollars alone, while vital, are only one part of the solution. As significant, possibly more, is my plan to bring focus, process, rigor, and accountability to our work of recovering our facilities and infrastructure. Facility management is a standard business practice of most major organizations. It is being reengineered within the NNSA. We have established an office to manage the facilities and infrastructure of the nuclear weapons complex. We are refocusing on long term planning, establishing the processes—absent too long—that will institutionalize the procedures, standards, and expectations for the complex."

General Gordon's message was heard, understood, and decisively responded to by Congress. Some $8.7 million was provided in the fiscal year 2001 Supplemental Appropriation. The Fiscal Year 2002 Energy and Water Development Act provided $200 million to the NNSA's Facilities and Infrastructure Recapitalization Program (FIRP). At the same time, the NNSA is furnishing visibility and accountability in the execution of these resources, which serve as the basis for its corporate management approach to restoring the weapons complex to an acceptable condition.

This significant funding, which you have provided, allows us to begin the long, tough effort to restore, rebuild, and recapitalize the nuclear weapons complex. My objective today is to provide you an explanation, in some detail, of what actions we in the NNSA have put in place over the last year. Since General Gordon last discussed his facilities and infrastructure requirements with you, he has directed a series of major changes to ensure that we will successfully and responsibly manage this major undertaking.

REORGANIZATION

As explained in the February 25, 2002, Report to Congress on the Organization and Operations of the NNSA, a new organizational component, Facilities and Operations, which I head, has been established to ensure the vitality and readiness of the nuclear security enterprise. Facilities and Operations have a series of wide-ranging responsibilities, which will allow the requisite attention to be placed on the physical assets of the nuclear weapons complex. Some of these responsibilities include: institutionalize professional and accountable corporate facilities management activities throughout the NNSA; setting policy and guidance for facilities management, and assessing the implementation of these across the complex; advocating that the programs provide appropriate resources to restore the infrastructure of the complex; and developing and managing the Facilities and Infrastructure Recapitalization Program, which I will explain in more detail a bit later. Responsible corporate facility management within the NNSA is built upon common industry practices of successful facility programs throughout the government, academic, and private sectors. Possibly the most important changes General Gordon has effected is to bring focus to the condition of our facilities and infrastructure, and tasking my organization to be "the empowered advocate for the stewardship of the complex." This, together with my membership on the NNSA Management Council, ensures that decisions made concerning the physical assets of the complex are founded in fact, with understanding and agreement of the risks and benefits, so that we are truly managing our $25 billion physical plant as a corporation.

To assist me in managing this undertaking, NNSA established within my component the Office of Infrastructure and Facilities Management. This office specifically oversees the implementation of corporate facilities management, and is the program manager for the recapitalization of the complex. To lead the program, the NNSA has selected a seasoned, experienced, leader—Bruce Scott. Mr. Scott trained outside the Department and has a proven track record. He is chartered with establishing a robust corporate facilities management process across the complex. I have charged him with the responsibility for establishing the proper level of resources necessary to restore the complex to a condition that supports the deterrent value of the Stockpile Stewardship Program. His staff represent some of the finest facilities professionals we have across the complex at all levels of seniority, and are a welcome blend of headquarters and field, with significant weapons program knowledge. The office clearly understands the support role of its mission, where its efforts are, from a strategic sense, to ensure a nuclear weapons complex of acceptable capacity and capability.

The NNSA has initiated a corporate rededication to our core values, mission, and vision. NNSA has formalized this in our recently published Strategic Plan of February 2002. Within this plan is a strong statement as to the importance of our facilities. We note, "substantial effort is required to restore our facilities to ensure adequate capability . . ." NNSA has codified its expectations that we are corporately

committed to professionally manage our facilities and infrastructure. In the Strategic Plan infrastructure and facilities are addressed by Strategic Goals 4: "Ensure the Vitality and Readiness of the NNSA's Nuclear Security Enterprise." Our strategy is to "Provide state-of-the-art facilities and infrastructure supported by scientific and technical tools to meet operational and mission requirements". To support this strategy are two strategic indicators: "Ensure facilities are available to perform our mission" and "Implement NNSA's Facilities and Infrastructure Recapitalization Program."

The NNSA reorganization has also significantly improved our corporate planning, programming, and budgeting. The reorganized budget processes provide significant benefit to our recovery efforts for the complex by ensuring a focused and corporate approach. You are aware of our efforts at establishing a longer term funding plan for the NNSA enterprise, codified in our FYNSP. Within this plan are included our specific direction for our recapitalization of the complex, the Facilities and Infrastructure Recapitalization Program (FIRP), which I describe below. We have laid out a credible and responsible funding program for the FIRP:

FUTURE YEARS NATIONAL SECURITY PLAN ESTIMATES

[In millions of dollars]

	Fiscal Year				
	2003	2004	2005	2006	2007
Facilities and Infrastructure Recapitalization Program	243	290	340	390	440

The fiscal year 2002 funding of $200 million provided a start-up that was large enough to make a clear positive impact across the entire complex, yet also manageable for a beginning program. I would add that the $8.7 million supplemental at the end of fiscal year 2001 was an excellent device to allow us to pilot in a hands-on manner, to prepare to execute professionally the current program. We have requested a ramp-up of some $50 million annually which we think is mandatory to effectively recover the complex. This ramp-up will allow NNSA to ensure processes are in place across the complex so that we demonstrate to you credible deliverables, efficiently managed, and fiscally accountable. It is easy to throw money at projects, it is hard work to manage them responsibly, and harder still to infuse accountability in an organization, which has been criticized for many years for weaknesses in this area.

So far, I have explained the NNSA organizational restructuring that allows a professional focus on our facilities, and the near-term funding we have planned to begin the recovery of the complex. I'll now address the specifics of the recovery plan itself.

THE FACILITIES AND INFRASTRUCTURE RECAPITALIZATION PROGRAM (FIRP)

The Recapitalization Program is established to ensure that the NNSA's contribution to the administration's strategic goal of maintaining a safe, secure, and reliable nuclear deterrence is fully supported. Its mission is to restore, rebuild, and revitalize the physical infrastructure of the nuclear weapons complex. The base maintenance and infrastructure efforts at NNSA sites are primarily funded within Defense Programs' Readiness in Technical Base and Facilities and through site overhead allocations. These efforts focus on ensuring that facilities necessary for immediate programmatic workload activities are maintained sufficiently to support that workload. Given the divergent requirements of programmatic issues, this funding has not been able to focus on improving the condition of a deteriorating nuclear weapons complex. Sustained, incremental, and preventive and other maintenance and infrastructure investments above this base are needed to extend facility lifetimes, reduce the risk of unplanned system and equipment failures, increase operational efficiency and effectiveness, and allow for recapitalization of aging facility systems. This is the specific focus, attention, and management responsibility of the Facilities and Infrastructure Recapitalization Program. It will apply new, increased, direct appropriations to address an integrated, prioritized list of maintenance and infrastructure activities, above current operating levels, that will significantly increase the operational efficiency and effectiveness of the NNSA weapons complex sites. FIRP activities are intended to increase the operational effectiveness of the entire sites and will recognize NNSA's landlord responsibilities at these multi-user sites: the Lawrence Livermore, Los Alamos, and Sandia National Laboratories; the Nevada Test Site, including the North Las Vegas Facility; the Kansas City, Pantex, and Y–12 Plants and the Savannah River Tritium Facilities. The FIRP alone will not refurbish the

complex, but it performs a vital function to help size the complete set of requirements necessary to restore the complex to an acceptable condition. It is key to maintaining the health of the facilities that house the activities conducted in support of the life extension programs. These programs are supported by the Defense Department as vital to deterrence and the strategic force multiplying effect it has regarding the stockpile.

The program has three interlocking and complimentary components. The major effort identifies recapitalization projects, which will significantly improve both facility condition and facility mission availability. Criteria for the selection of these projects are those maintenance backlog and infrastructure activities, currently unfunded, that will significantly improve the physical conditions and mission availability, as well as address the infrastructure responsibilities, of the NNSA nuclear weapons complex. These activities are vital to the accomplishment of program, yet they are not tied to a specific Campaign or Directed Stockpile Work. Because of their cross cutting nature, they have not previously achieved priority within strictly programmatic budget reviews, with adverse impact to the complex. Recapitalization targets specific, individual projects to ensure clear visibility of improvements: discrete backlogged maintenance projects; non-programmatic General Plant Project (GPP) improvements and construction; capital equipment purchases; etc.

An additional important consideration of the program is the inclusion of projects that provide cost saving and investment payback. NNSA's analysis of facilities and infrastructure identified in their assessment report—2000 that, too frequently, due to the absence of preventive maintenance, facilities were being run to failure. Projects in this program provide an immediate positive effect on the condition of a given facility, and result in the saving of maintenance dollars—in the long term, preventive maintenance costs are significantly less than corrective maintenance actions.

The second component, Facility Disposition, provides funds to dismantle and dispose of excess non-process contaminated facilities. Disposition reduces environmental, safety and health, and safeguards and security challenges, and thus costs for those deactivated facilities and infrastructure that are excess to current and future mission requirements. These actions are taken at the end of the life of a facility to retire it from service, to reduce the overall footprint of the complex, and to reduce safeguards and security requirements and long-term costs. These actions will improve our ability to manage the facilities portfolio. They enable the necessary footprint reduction of the complex. The Fiscal Year 2002 Energy and Water Development Appropriations Act conference report directed the NNSA to allocate 25 percent of the appropriated dollars for the recapitalization program to reduce the NNSA footprint by the elimination of excess facilities.

The third component, facility planning, ensures the requisite planning for next year Recapitalization and Disposition projects, to include project base lining and readiness to obligate funds. It also funds assessments to support the prioritization of backlogged maintenance and facility consolidation efforts. Finally, it provides for planning and conceptual design of high priority general infrastructure projects. Within this effort is the development of analytical methods and tools for establishing credible restoration plans for each NNSA site using the newly-revised 10-year comprehensive site plans; infrastructure assessments to support the FIRP prioritization of maintenance and facility consolidation efforts; and planning and conceptual design activities for future priority landlord infrastructure line item construction projects, specifically targeting utilities improvements.

With the Facilities and Infrastructure Recapitalization Program at work, the nuclear weapons complex is on the verge of realizing improvements, upgrades, and facility life extensions that can be measured. Nuclear deterrence through capability is established on the bedrock of a reliable complex. Possibly for the first time within the NNSA, corporate facility management is coming on line; it has the potential to enable and empower governance and stewardship of the NNSA for the physical complex.

FACILITIES AND INFRASTRUCTURE RECAPITALIZATION PROGRAM EXECUTION FOR FISCAL YEAR 2002

The principal objective of the fiscal year 2002 FIRP is to arrest the deterioration of the nuclear weapons complex occurring this year. The NNSA has identified 81 recapitalization projects for execution in fiscal year 2002, costing $137.7 million. The principal thrusts of the fiscal year 2002 program are to attack the areas of failed roofing; correct urgent atmosphere control, water, and electrical system repairs; and address a significant level of deferred maintenance issues. Upgrading and replacing HVAC systems for essential laboratory and manufacturing facilities are planned.

We begin general plant construction projects; and renovation of mission essential buildings to permit more efficient operations and consolidation of personal are undertaken. Some specific examples, site-by-site, follow:

- **Kansas City Plant**—Replace and upgrade chillers, air handling, and dehumidification systems supporting essential production buildings. These projects provide environmental controls related to manufacturing processes, in support of reservoir and Lifetime Extension Programs for the W–76 and W–80 weapons programs. Execute the new Tri-Plant Roofing Partnership for repairs to Kansas City, Y–12, and Pantex roofs.
- **Los Alamos National Laboratory**—Construct four new buildings that consolidates laboratory and support functions into modern, safe, and efficient spaces and removes costly, old temporary structures.
- **Pantex Plant**—Undertake the most critical of a large backlog of essential roofing repairs for vital production buildings. Begin to work down the large deferred maintenance backlog throughout the plant; and complete repairs and upgrades to essential emergency and life safety systems. These projects support the Life Extension Programs, High Explosive Operations, and the W–76 and W–80 weapons programs.
- **Sandia National Laboratory**—Refurbish three critical laboratory and test facilities, including their structural, utility, and power systems and test equipment. These facilities were at risk of losing capabilities supporting the Defense Programs mission in weapons qualifications, development, investigation, modeling, and simulation.
- **Lawrence Livermore National Laboratory**—Building improvements include the replacement and upgrade to mechanical systems, including HVAC units, air conditioners, air handlers, fans, HEPA filters, and fan controls; electrical systems, and other components. Process improvements include an upgrade to the operational capability at the S–300 high explosive facility, to improve the processing of high explosive parts, and the integration of new computer controls. These projects also provide for improved machine tool reliability, new high explosives equipment and tools in support of mission essential weapons qualifications activities.
- **Nevada Test Site**—Projects concentrate on improvements to communications and safety systems. Older communications systems are being replaced with fiber optic cable, and upgrades are planned for emergency, fire, and remote radiation alarms at test facilities.
- **Savannah River Site**—Projects at the Savannah River Site include the improvement to the telecommunications distribution network within the tritium area. These projects also replace and upgrade the hydride bed portion of the thermal cycling absorption process necessary for tritium production.
- **Y–12**—Large scale roof repairs and addressing the significant maintenance backlog throughout the site are underway. Other repairs and improvements will be made to incinerators, steam coils, power panels, oil storage facilities, transformer stations, lighting, and flooring systems. Specific facilities upgraded include the nitric acid pickling tank, and the replacement of bond strand piping, which transports waste effluents from the steam plant to the treatment facility. The concrete spalling from the ceiling of part of the production complex, discussed as a striking example of our facility concerns by General Gordon in his earlier testimony, is being addressed. These activities support, among others, the W–87 Weapons Programs, and production work for the Joint Test Assemblies.

We have scheduled 19 infrastructure planning projects, costing approximately $9.2 million. These are high priority FIRP recapitalization and facility disposition projects scheduled for execution in fiscal year 2003. A representative sample of these projects includes: design of chilled water, steam, and condensate piping systems at Kansas City; corrective maintenance projects for Los Alamos; Sandia is designing HVAC, reactor cooling system replacements and upgrades. At the Nevada Test Site, major improvements are planned for the Test Site water system, including refurbishing multiple tanks representing some 2 million gallons of potable water, replacing pipeline and upgrading electrical support services, and addressing seismic and structural issues. Savannah River projects include electrical component replacements and communications upgrades.

The FIRP is conducting 33 facility disposition projects this year, at an estimated cost of $50 million. The funding level is directed by the Fiscal Year 2002 National Defense Authorization Act. Execution of these projects reduces the footprint of the overall NNSA holdings by some 500,000 square feet. The projects selected will re-

move about 217 buildings and structures. The largest footprint reductions will be at Y–12 and the Nevada Test Site. One-third of the facility disposition funding was allocated to Y–12 ($17 million) given the NNSA's commitment to aggressively reduce the footprint at that site. Security improvements at Y–12 and Pantex accrue due in part to a smaller "limited area." At Savannah River Site, Sandia National Laboratory, and Los Alamos National Laboratory, footprint reductions free up key locations. Once cleared new programmatic needs will be satisfied and facility consolidation can occur. Reductions to environmental, safety, and health risks are achieved at Nevada Teat Site (reducing worker exposure to rodent borne Hanta Virus), Y–12 (safety issues due to deteriorating structures), and at Lawrence Livermore and Sandia National Laboratories (structural roofing concerns). In addition, savings will begin to accrue for many sites as the disposition of excess facilities reduces the NNSA's burden of surveillance and maintenance operations currently required to ensure these excess facilities remain in a safe condition.

INTENTIONS FOR FISCAL YEAR 2003

The NNSA is shaping the foundation for a professionally managed infrastructure. Many aspects of our approach to corporate facility management are undergoing process improvement. This includes those processes used to manage the Recapitalization Program. The successful implementation of 10-year comprehensive site plans (TYCSP) forms the foundation for bottoms-up recommendations for recapitalization projects. Looking ahead, in fiscal year 2003, the program plans to undertake the following:

- Fund the recapitalization component at about $180 million, which will begin the stabilization of the overall condition of the nuclear weapons complex. Projects will be funded from an integrated, prioritized list using the fiscal year 2003 TYCSP inputs from each site.
- Planning conducted in fiscal year 2002 will be executed in fiscal year 2003, allowing acceleration of the pace of conducting the recapitalization projects (e.g. long lead materials are ordered, cost estimates are more accurate, management is in place).
- Facility Disposition will continue at the same pace as fiscal year 2002, supporting a further footprint reduction of some 500,000 square feet of excess facilities.

CORPORATE APPROACH

The NNSA approach to management of its facilities and infrastructure is corporate. Dr. Beckner has described his programmatic approach, and the use, which he makes of his Readiness in Technical Base and Facilities funding. I have just covered my Facilities and Infrastructure Recapitalization Program. He is the line program manager for the sites, I support his program needs. Our efforts meld well together for the improvement of NNSA's corporate governance. For facilities especially, our programs are truly complimentary. The FIRP provides the ability to plan in advance which major projects the sites can undertake on an annual basis, without the risk of internal reprogramming to non-facility issues. It makes significant, visible, and very positive differences at the sites, supporting program and mission. This is a major improvement in the management of facilities. Previously, sites could rarely undertake large scale improvement efforts because the dollars to do so never seemed to make the priority "cut." Since FIRP is a stand alone program, directly focused on facility improvements, it compliments Defense Programs activities. Close cooperation exists among the field professionals, headquarters, and with the scientific and production program offices of Defense Programs and Facilities and Operations to corporately restore the complex. This is as true in my corporate facility management responsibilities as it is with the funded programmatics such as FIRP and RTBF. A specific example will be illustrative.

TYCSPs are the foundation for NNSA complex-wide facilities and infrastructure strategic planning, and the cornerstone of the effort to restore, revitalize, and rebuild the complex. The TYCSPs focus management attention on current and future facility and infrastructure needs at each site in support of Directed Stockpile Work and campaign programmatic requirements. It provides a resource-constrained plan consistent with site-specific funding profiles provided by the NNSA from the FYNSP for meeting these needs. We have not really had credible site planning tools before. These TYCSPs are one of a series of corporate facility management processes which my organization is bringing on line as part of the NNSA reorganization. It allows NNSA to make comparisons and informed corporate planning; and empowers the use of metrics, benchmarks, and performance objectives complex-wide. The ability to realistically plan and execute toward the desired and intended complex of the fu-

ture is possible. Formal feedback between headquarters, field, and the contractors, linking budget realities with technical requirements, allows NNSA to begin managing our physical complex as a corporation. Institutionalizing the TYCSPs into NNSA's business ethic across the complex is a major step toward corporate governance and accountability. I mentioned that this is a corporate approach: The TYCSPs provide both Dr. Beckner, who has the line responsibility for the sites, and myself, who provides support and manages the FIRP, information we both need in our separate areas. I manage the TYCSP process, and Defense Programs is the major customer of the deliverables. There are close working partnerships between our organizations throughout the TYCSP process. This allows each to focus on our areas of expertise, and is truly a success for the NNSA.

FIRP—THE PATH FORWARD

I have explained the significant efforts the NNSA has underway to address the recapitalization of the nuclear weapons complex. Let me lay out the path ahead, as we see it today. The various assessments, both ours and of independent parties, clearly describe the general long-term financial commitment and management effort required to establish a capable and credible physical complex to support the Stockpile Stewardship Program. These assessments make a strong case for a minimum effort of some additional $500 million annually for 10 years or more. Our efforts with the FIRP recovery program to date fall in line with this programmatic level of effort. It is quite apparent that our program this year, our $200 million, will probably arrest the deterioration we see occurring on an annual basis. Over the next several years of the ramp-up of the FIRP program, we will ensure the stabilization of the condition of the complex, and in places begin to make marked improvements in discrete areas. As an example, we need to target the significant deferred maintenance backlog which we have built over the last several years. This area costs us dearly in corrective maintenance and threatens unacceptable mission downtime. It is the price we now pay, along with many other undesirable effects, from large scale chronic underfunding of facilities. It is the NNSA's intent to stabilize our deferred maintenance backlog by fiscal year 2005, and aggressively reduce it to within industry standards by fiscal year 2009. This is not just a funding issue, it is also a significant management effort to address this competently—but without the funding, no management program would succeed. We want to return our facility conditions, for our programmatic facilities and specific other important infrastructures at a minimum, to an assessment level of "good to excellent." Likewise, we need to dedicate the resources to maintaining the new facilities we are bringing on line at that same assessment level. We must continue the efforts we have underway to reduce our significant amount of excess facilities. Beyond the costly surveillance and maintenance bills that accrue, and the long-term risks and hazards involved, we owe our work force, our most valuable resource, a professional working environment in which to carry out the national security mission. Finally, but most important, we will have institutionalized responsible and accountable facility management processes, including budgetary ones, so that the NNSA does not revert to the practices of the past that have given us the results currently seen at Y–12, Los Alamos, Pantex, and others.

The NNSA feels that this program will be able to execute the above deliverables within the funding levels and timeline we propose. We will close out this program, merging it into the core NNSA funding components, when we accomplish our mission. I must caution that this undertaking is only in its infancy. We have the situation currently, the major recovery challenge, because of long-term inattention. It will take long-term attention, managed on a day-to-day basis, to recover. I would offer that until we truly begin to turn the corner on the recovery of the complex, any more specific plans on the end game, as it were, for this program would be premature.

ISSUES

The issues that face the NNSA as it executes the Facilities and Infrastructure Recapitalization Program are typical of any large corporation undergoing change. Principal among them is the challenge of changing the culture of the past. We are dedicated to the principle that the past is not prologue to the future. As outlined, policies, plans, and actions are being put in place to embed the culture of professional corporate facility management. The new NNSA offices that manage this effort are populated with dedicated facility professionals. For the most part, this program is being embraced. Among some, a wait-and-see reaction is manifest. General Gordon's commitment to you is that we are prepared to prevail over our critics, and maintain

the program at a very high level for a very long time. I am confident that through demonstrated performance, corporate facility management will thrive.

However, the most challenging issue facing us is to convince you and your colleagues that despite the expense and length of the FIRP, the NNSA is earning and warrants your continued support. Simply stated, the NNSA has critically assessed itself: the complex was determined to be failing. We have taken responsible action by citing the problem and providing a reasoned and thoughtful solution. Money, though very important, is not the complete solution. Management, if not broken, was certainly unfocused and inattentive, having lost sight of the importance of maintaining the weapons complex. Today, we report that responsible management practices are established, operating, and showing results. Fiscal visibility and accountability are in place to husband scarce resources. Close cooperation with the programs serves as a check and balance on proposed project priorities. Metrics are in place to determine progress. Finally, the merging of all this combines to a solid program of corporate facilities management comparable, we believe, to the best programs in government.

SUMMARY

The nuclear weapons complex is a vital component of our national nuclear security strategy. In its current condition it is potentially a weak link, which is receiving immediate attention. Congress has taken the first restorative steps. The NNSA is organized to manage the challenge. Long-term funding support is crucial to our success. We expect to be held accountable. Thank you for the opportunity to report our progress and make the case for the future.

Senator REED. Thank you, Mr. Erickson.

We will engage in at least one 6-minute round of questions. Let me begin by asking a question of Dr. Beckner. In your formal testimony you state that NNSA has started an advanced concept initiative because current nuclear weapons in the stockpile cannot "hold at risk a growing number of targets deeply buried in tunnel facilities." Is the Robust Nuclear Earth Penetrator (RNEP) the first of the projects in this initiative?

Dr. BECKNER. Yes.

Senator REED. What do you mean by the term "hold at risk," Dr. Beckner?

Dr. BECKNER. The Nuclear Weapons Council (NWC) has determined, after receiving input from various parts of the Government, that a target set, generally defined as deeply buried and hardened, cannot presently be held at risk with the arsenal that is available, or you might say is not easily held at risk with that present arsenal, and has instructed the laboratories through the NNSA and the Air Force as the DOD agent should explore the modification of two existing weapons to determine if they could be used against such targets effectively.

That is the program that has been authorized by the NWC and the one that we are presently contemplating getting started.

Senator REED. It seems, if you listen to the response, doctor, that you defined "held at risk" as "hold at risk." Are we talking about totally destroying a target? Are we talking about closing the earth so that whatever is down there cannot emerge?

Dr. BECKNER. You are getting into an area that we do not normally take responsibility for. Generally, we are requested to develop the understanding of the performance of a nuclear device under certain conditions. The effectiveness of that device against a particular target is "not our business." What is our business is responding to the requirements that are specified to us.

In this case, the requirements are that such a weapon would be able to penetrate to a certain depth in a certain form of earth and still operate successfully.

Senator REED. Do you have other projects that will be included in this initiative?

Dr. BECKNER. Not at this time. It is quite specific as to what they have asked us to do.

Senator REED. Now, I know your response was essentially that you have been given some very specific parameters and you are really modifying a weapon to conform to those parameters.

Dr. BECKNER. That is correct.

Senator REED. But certainly this whole project raises an issue that, if a conventional weapon could not either penetrate, destroy, or seal an underground passage, would a relatively small nuclear weapon, one kiloton or less, be able to address the problem? I presume that is the range you are operating in.

Dr. BECKNER. No, it is not. The two weapons (B61, B83) that we have been asked to consider are both relatively higher yield weapons. They are not low-yield weapons.

Senator REED. But again, from your response, the specific target or the effect on the target is something that you just do not know? It is not part of your responsibility?

Dr. BECKNER. That is not part of what we have been assigned to do at this time. This is specifically to explore the ability to survive the environment as specified and to function.

Senator REED. Thank you.

Dr. Beckner, turning for a moment to the Nuclear Posture Review, there are various categories of nuclear weapons. They have been discussed generally, and indeed the stockpile is generally divided into two broad categories, active and inactive. Can you define the active stockpile from the DOE perspective, and are there differences between the number of warheads in the active stockpile according to the 1994 review and the number of warheads in the active stockpile in the December 2001 review?

Dr. BECKNER. Well, there are certainly differences in that the category that was previously described as active, I think within the context of today's understanding of the NPR, is larger than what we would now identify as operationally deployed. It has more or less been put into two parts, one part being operationally deployed and the other part being the responsive force. In the past, we might have viewed those as all part of the active stockpile. Then as you say, there is yet a third part, described as inactive; and finally, those weapons that are retired. But the difference that has occurred as a result of the NPR is largely in the distinction between those that are operationally deployed and those that are in the responsive force.

Senator REED. Well, perhaps another question. The active stockpile, they will be fully maintained, modernized, and loaded with tritium?

Dr. BECKNER. Yes.

Senator REED. Will there be any subcategories, any differences in the active stockpile, or they will all be treated the same?

Dr. BECKNER. Let me answer in a fairly complicated way. For the active, the operationally deployed, those will be fully prepared, trit-

ium, everything ready to function. In the case of the responsive force, it is our understanding that there would be some flexibility, depending on the time required for those weapons to be moved from the responsive force back to the delivery system that they are associated with, if that were required.

In some cases that would be a very short period of time and in other cases it is a rather long period of time, due to the nature of the way those weapons are uploaded. In either case, if they were called upon they would have to be fully functioning at the time they were mated with the delivery system. So the task that is put to us is to be able to meet that requirement, and it is a little different depending on which delivery system you are talking about.

Senator REED. Without getting into any specifics, obviously, it seems that the response force will have various response times.

Dr. BECKNER. Yes.

Senator REED. You have to be prepared in your planning to accommodate those response times.

Dr. BECKNER. Yes.

Senator REED. Some of those weapons systems will have relatively short response times, so in effect they will be fully modernized?

Dr. BECKNER. As far as the requirements that would be placed on us to supply tritium and other components, the answer to that is yes.

Senator REED. Thank you.

Let me turn to Senator Allard.

Senator ALLARD. Thank you, Mr. Chairman.

Let me ask a question about your shipping of nuclear material and weapons. When you are shipping your nuclear material and weapons, what are the goals of NNSA when you try and determine the best routes? Then a second part to that, are there certain driving conditions NNSA tries to avoid?

Dr. BECKNER. First let me say that, as I believe you know, we do not publicize the routes that we use, for obvious reasons, when shipping weapons or weapons parts. We do select routes that are the safest possible. They might not be the shortest routes. So we make those kind of decisions.

We also do planning so that we do not have to conduct shipments into areas at the wrong time of year, for instance shipments into the northern midwest in the winter time. We just plan to do those in the summer rather than the winter because it is a better idea.

So all in all, we make those choices so that the shipments will be safe, so that the routes are the safest possible. We try to avoid congested areas so that we do not get inadvertently stopped for long periods of time when we were not planning on such things, and generally try to keep ourselves in a position so that the mission will be successful.

Senator ALLARD. Mr. Erickson, I do not want you to feel neglected over there. We have not asked you any questions. You are next.

Mr. ERICKSON. Not a problem.

Senator ALLARD. Has the funding authorized and appropriated for fiscal year 2002 been used in a productive manner according to NNSA's plan for improving the facilities and infrastructure?

Mr. ERICKSON. Yes. We have obligated all those funds to date and the plants and labs who have received funds are in the process of executing the projects to go along with that.

Senator ALLARD. So there will not be anything left over at the end of this year?

Mr. ERICKSON. All the money has been obligated. It probably all will not be spent, simply because of delivery of material, authorization of contracts, and the fact that the second $100 million was held until we delivered a report to Congress in February. Therefore, those monies were not available to us to obligate or to begin costing until that time.

So all the money will be obligated, all $200 million. Certainly not all $200 million will actually be costed. It will flow over into the succeeding fiscal year.

Senator ALLARD. How do you envision this program proceeding over the next 10 years in light of the Foster panel recommendation and the administration's request within the Future Years National Security Program, as the program is often referred to, FYNSP?

Mr. ERICKSON. We have a sustained growth over that period of time, over the FYNSP period of time, taking us to what we believe are acceptable levels of the program. It is a reasoned, well-planned approach. It goes up approximately $50 million a year for each of those years, allows us to establish a good program, a process in place to effectively and judiciously spend that money.

Senator ALLARD. Thank you.

Dr. Beckner, concerning shipping plutonium and other special nuclear materials, can we be sure that NNSA will keep the shipping of plutonium and other special nuclear materials from EM sites on schedule? Then has the NNSA prepared a realistic plan to keep up with the anticipated schedule of shipments within both Defense Department and EM during the next several years?

Dr. BECKNER. We do have a plan. In fact, we have more than one plan because of the uncertainty about the date when shipments may start from Rocky Flats. The situation is getting to be difficult as time goes by and those shipments do not begin. At this time we see every passing week as additionally troublesome.

We will do our very best to meet the schedules of both our military customers as well as moving the waste out of Rocky Flats. However, I must say that the conflict becomes more obvious, rather pressingly so, during the next 2 months, and beyond that there is no question there would be serious conflicts between those two programs.

So on a week-by-week basis this is getting to be a more difficult problem. At this time we believe it is manageable, but it will not be manageable indefinitely. There will have to be selection made on how those assets would be used one program versus the other if this delay goes on much longer.

Senator ALLARD. Now, on the issue of safeguards and security, do you intend to request additional security funding from Congress for fiscal year 2003? Can you give us an idea of how much and for which sites?

Mr. ERICKSON. Senator, if I may, actually safeguards and security falls under my purview.

Senator ALLARD. OK.

Mr. ERICKSON. In answer to your question, we do not intend at this time to ask for additional funds.

Senator ALLARD. Well, how is this going to affect security at the various sites?

Mr. ERICKSON. We are in the process of going through a rather extensive review at our sites to evaluate the changes due to September 11, the activities and the safeguard and security responsiveness at those sites. That review is under way at our various sites. We will have a better feel for that towards the summer, the latter part of the summer. At that point in time, it will be what it will be and we will have to make a judgment at that point in time.

Senator ALLARD. Thank you, Mr. Chairman. I see my time has expired.

Senator REED. Thank you very much, Senator Allard.

Senator Sessions.

Senator SESSIONS. Thank you, Mr. Chairman.

Mr. Erickson, one of the issues that is of great concern to me is the fact that the United States is the only nuclear power in the world that has no capability of producing a nuclear weapon today. While I am not advocating that we need to produce a weapon now, I do find it disturbing that we do not have the capability to produce one if the President determined that such production was in the national interest due to some emergency.

I have heard testimony this year and in the Foster report of 2000 that it will take between 10 and 15 years to design and build a new Modern Pit Facility which would give us the capability to build a new weapon. The Nuclear Posture Review calls for the design and construction of a Modern Pit Facility. The Nuclear Posture Review called for that.

My question is, can you explain the decision in the fiscal year 2003 budget submission to postpone the critical decision on mission needs, also known as CD–0, by 1 year? Why was that?

Dr. BECKNER. If I could, sir, I think I should try to answer that question.

Senator SESSIONS. All right.

Dr. BECKNER. In fact, we are moving ahead with those decisions. There are ways, utilizing existing facilities at Los Alamos, to produce a limited number of pits. We are in the process of proving that out now around the program for the W88 warhead where we need to provide additional pits.

Having gone through that process, as long as the production requirements were quite modest, we could produce other pits for other weapons, I believe. In the long run, however, I think we all agree we need a better capability. That does call for a Modern Pit Facility or some capability that is substantially beyond any that exists today.

So we are setting about to make those decisions and to get that program underway, and we will be making the first of those decisions within the next few weeks.

Senator SESSIONS. Well, is that not the purpose of the CD–0 plan?

Dr. BECKNER. Yes, it is. We are going to move ahead with that decision.

Senator SESSIONS. But this would be a delay?

Dr. BECKNER. No.

Senator SESSIONS. In what we expected?

Dr. BECKNER. I know that we are going to make the decision within the next several weeks and move ahead with the early work on that facility.

Senator SESSIONS. Since we have such a long lead time if we were developing a new pit facility, in one sense it seems we do not have much to worry about, that takes a long time. But in another sense, every year that goes by delays even further, does it not?

Dr. BECKNER. Yes, it does.

Senator SESSIONS. Could the gap, the delay period, be shortened?

Dr. BECKNER. There is no question that if we must build a new facility that it will take more than 10 years from today to completion. It is probably closer to 15 years than 10 years. As long as the stockpile is as presently configured and as large as it presently is, and as long as we have to contemplate the possibility of replacing some large number of those pits over the next 20 or 30 years—and as yet we do not know if that is necessary, but we have to believe that we should be prepared for it—then I think that does call for a new facility.

So we will set about to go through the National Environmental Policy Act (NEPA) process within the next 2 to 3 years, to get site selection, and to move ahead with a design.

Now, should the stockpile become much smaller, then I would say we would rethink some of that, and there is the opportunity to do that. But, based on the present planning, we will go ahead.

Senator SESSIONS. It is this CD–0 study that is supposed to guide us on that?

Dr. BECKNER. Yes. There are two things that it would do, it starts the NEPA process and conceptual design.

Senator SESSIONS. I understood that there was a delay by one year in the decision, postponing the decision on mission need.

Dr. BECKNER. It might have been—I confess, I have not been around long enough, that I do not quite bridge all of the history here. There may have been a delay from a previous date that might have been planned. I cannot say for sure. But I do know what our present plan is. Our present plan is to go ahead with that decision within the next several weeks.

Senator SESSIONS. All right, that is good.

Now, if we decommission or dismantle an existing nuclear weapon—either one of you can answer this—is the pit preservable?

Dr. BECKNER. Yes, it is.

Senator SESSIONS. Unless we destroy it.

Dr. BECKNER. Yes, it is.

Senator SESSIONS. The President has decided to maintain those pieces, at least so they can be reassembled if needed, but to decommission the weapon otherwise; is that the way you understand it?

Dr. BECKNER. Yes. There has been a large number of weapons already disassembled and the pits are indeed in storage right now.

Senator SESSIONS. Well, I think that points to the criticality of this whole circumstance, in which we are the only nuclear power that does not have the capacity to go forward, and we cannot afford to place ourselves at risk by destroying all the component parts. So

we can decommission, certainly fulfilling, I believe, the spirit of our commitment to reduce nuclear weapons, but at the same time say to a potential adversary: If you think you are going to take advantage of our freeze and reduction, do not think you can get ahead of us just because we do not have a production capability.

So I just think we are stuck. I think the President is correct on that.

Thank you, Mr. Chairman.

Senator REED. Thank you, Senator Sessions.

Dr. Beckner, the NPR directs improvements in the test readiness posture, and I understand that you are studying the test readiness posture. When you conduct this study, I presume also you are including the cost of various options, the benefits to the Stockpile Stewardship Program, and also essentially whether or not the time limits or time frames are appropriate.

Can you comment on that, your current review of the test readiness?

Dr. BECKNER. Yes. The present posture is that we would be able to conduct a test, if so instructed, within 24 to 36 months. There has been some criticism of that by various learned bodies. The Nuclear Posture Review suggested that we should take a fresh look at that situation and decide if that is the appropriate posture or not, to do the proper analyses, to assess the cost-benefit of changing it. Almost certainly, if it were to be changed it would be shortened. The suggestion has been made by some that it should be as short as perhaps a year or a year and a half or 2 years. So that is what we will study. There are costs associated with changing that configuration and so it will in effect become a cost-benefit tradeoff. We will develop the information and we will provide it to the people who have requested it, and some new decisions will be made as to what that future readiness state will be.

But indeed, we have been instructed to begin those studies and we will do them.

Senator REED. So you have not—you are not evaluating any specific time frame? You are simply looking at a whole range of options, is that fair?

Dr. BECKNER. Well, we will probably select three or four that seem to be the most obvious and work on those. There is a limit on the short side as to what is possible. So you will start with the possible and move up from there. You have to realize the purpose of this would be to put ourselves into a configuration across our facilities so that we could execute whatever that new response time might be. Those costs get to be considerable if you shorten it greatly.

Senator REED. Thank you, doctor.

Mr. Erickson, so that you will not be totally neglected by my questioning: You received your new facilities and infrastructure account full funding in the fiscal year 2002 budget, but you had about a year to plan for it. As a result, your office was ready to begin almost from the day the money was available. When did you get the release from DOE to begin the work?

Mr. ERICKSON. We got our release on the first $100 million, as I said in my earlier answer, in November. Obviously, because of the appropriations process, it was later than October 1. We received

that and began to immediately start to send out the work authorizations to the sites. That has added a little bit to, as I say, the reason why we are not going to cost all of the money. We will have it all obligated, but not costed. So there was a delay.

Senator REED. But you will fully obligate the funds, the 2002 funds?

Mr. ERICKSON. They are fully obligated today.

Senator REED. Thank you very much.

Senator Allard.

Senator ALLARD. Thank you.

On the Stockpile Stewardship Program, Dr. Beckner, are we adequately funding the key weapons program activities, namely the directed stockpile work and the science-based campaigns?

Dr. BECKNER. We believe we are. If you look in detail at the profiles of those programs, comparing, for instance, the 2002 budgets to the 2003 budgets and then the out-years as well, since we have provided 5-year profiles, what you see is more growth in the directed stockpile work than in the science program. That is the choice we have made. We believe it is proper. We know it is necessary in order to maintain the schedules that we are committed to on the directed stockpile work and we believe the science programs are adequate to support those. It is a tight fit, but we believe it is adequate.

Senator ALLARD. So you spent twice as much on the science-based stewardship actually in your budget as compared to your stockpile work; is that correct?

Dr. BECKNER. We have to be a little careful. Much of what is in the science programs is in direct support of the stockpile program. You essentially have the several budget areas that we like to manage by. But much of the work down in those science programs in fact specifically supports the directed stockpile work, so that you can get the work done at the time that it is required. So there is a lot of mixing of the budget from those two areas.

Senator ALLARD. From what I have seen as far as our educational efforts, we are graduating more and more individuals that are trained in what I would call the leisurely sciences and fewer and fewer people graduating as engineers in the hard science degrees. I do not think they are meeting the demands out there for a lot of our scientific endeavors throughout the country.

What is DOE doing to make sure that it attracts, trains, and provides the experience for the next generation of technicians and engineers and whatnot within the weapons programs?

Dr. BECKNER. The main attraction, quite honestly, is the facilities that are available and the opportunities to do the work that are there as a result of those facilities. In many cases we have capabilities at the laboratories and at the plants which are unmatched anywhere else in the country. For instance, take the NIF that is presently under construction. That is a one-of-a-kind in the world.

Take the Dual Axis Radiographic Hydro Test (DARHT) facility that has just been completed at Los Alamos. That is unparalleled in terms of its capabilities. You can go to each of the laboratories and you will find that kind of capability, due to the foresight, I think of this subcommittee and others in Congress to provide those

facilities. That is the real attraction and that is what makes it possible to hire great people, is if they have a good place to work and the opportunity to do challenging work. The reality is it works very well.

Senator ALLARD. Now, in December of 2001 the DOE Inspector General report criticized DOE for "not meeting internally established time frames for initiating and conducting investigations of defects and malfunctions in nuclear weapons." Then, the DOE IG went on further to state that "If these delays continue, the Department may not be in a position to unconditionally certify the aging nuclear weapons stockpile."

What are the DOE and NNSA doing to address those concerns raised by the DOE Inspector General?

Dr. BECKNER. Indeed we are concerned by that report. We are concerned by the fact that in some cases the delays were unnecessarily long. We expect to have a lot of so-called SFIs, significant findings investigations, from the program. That is the purpose of it, to find things and then set about to correct them. The part that was not getting as much attention as needed was the part of setting about to correct them. We have put new emphasis upon that. We are developing a schedule to more rapidly close those SFIs and get on top of the problem. I think by the time we are here next year the record will show that we have done that. It has our attention and the situation will change.

Senator ALLARD. Apparently one of the problems is having somebody who will centrally track the investigative process. Do we have somebody who is going to be tracking, be using a central tracking system?

Dr. BECKNER. Yes.

Senator ALLARD. Mr. Chairman, I am finished.

Senator REED. Senator Sessions, do you have additional questions?

Senator SESSIONS. Well, I just noticed that the fiscal year 2002 funding for Modern Pit Facility was $4 million. The 2003 request is $2 million. Does that indicate a slowing down of interest or more delays out there?

Dr. BECKNER. No, I think it just recognizes the fact that there are a lot of things going on here in parallel. I would encourage you to look at several elements of the pit fabrication and certification program in combination with the Modern Pit Facility. Look at all of those budget lines in combination. We are taking all of those parts and looking out over the next 5 years and fit them together so that this program will proceed. I know you look at a budget and you see one number smaller than the other one and you think the program must be slowing down. It is not.

Senator SESSIONS. Well, we certainly do not believe that money means that we are making progress. Sometimes money does not mean that.

Dr. BECKNER. Well, that is right. But we are entering a point here where much of what will be going on is the initiation of the National Environmental Policy Act (NEPA) process and getting started on the initial design studies.

Senator SESSIONS. When do you think you might start the NEPA process?

Dr. BECKNER. As soon as we get the CD–0 decision, which does require the full action on the part of the DOE, which is a bit of a big deal within the building. But we expect that in the next several weeks and that will kick it off. We require that before we can begin the NEPA process and before we can begin the conceptual design. But once we have that, we are on our way.

Senator SESSIONS. Well, I know Congress has an interest in getting moving along. The report language in last year's defense bill authorized $10 million in report language if you chose to move this project forward.

So I just hope that do not let it slip and we keep our eye on the ball and keep it moving.

Dr. BECKNER. I agree.

Senator SESSIONS. Thank you, Mr. Chairman.

Senator REED. Thank you, Senator Sessions.

Senator Allard, did you have a comment?

Senator ALLARD. Yes. Mr. Chairman, I understand you are getting close to concluding this hearing. First of all, I wanted to thank you and your staff. I know that you personally are interested in improving the environment in the country and particularly have been supportive of trying to get sites cleaned up throughout the country, not just in Colorado. You have been very supportive of my particular project and I appreciate that, and so has your staff.

I just want to recognize in a public way your commitment to getting these sites cleaned up and your working with your staff, and I appreciate that very much.

I also wanted to recognize Senator Strom Thurmond, who represents the State of South Carolina. He has been a mediator in our negotiations with what is happening at the Savannah River Site and the Governor there. Again, he understands basically that all these sites interact and when you have problems at one site there is a chain effect and it spreads all over the country. He has been very sensitive and taken a view that I think has been very responsible from a national perspective, and he has indicated how important it is to have cooperation among the various States.

So Senator Thurmond has been spending a considerable amount of time working between our two staffs as a mediator and I just wanted to recognize his efforts, too.

Thank you, Mr. Chairman.

Senator REED. Thank you, Senator Allard. I have a joint statement from Senators Thurmond and Sessions, for the record. Without objection, I will place it in the record.

[The joint prepared statement of Senator Thurmond and Senator Sessions follows:]

JOINT PREPARED STATEMENT BY SENATOR STROM THURMOND AND SENATOR JEFF SESSIONS

Sustaining our nuclear weapons at the highest state of readiness is central to the Nation's security and military strategies of deterrence.

However, for the past 3 years the *Panel to Assess the Reliability, Safety, and Security of the United States Nuclear Stockpile,* better known as the Foster Panel, has produced alarming reports that stated in part, "we already see worrisome signs of deterioration in some nuclear components." Even Gen. John Gordon, of the NNSA, highlighted the concerns associated with this deterioration when he testified before this subcommittee that "unanticipated events could include the catastrophic failure of a deployed warhead type."

Although the Foster Panel provided a series of recommendations, its primary recommendation each and every year has been to immediately begin conceptual design of a full-scale plutonium pit production facility for the long-term support of the stockpile. Unfortunately, the Department of Energy has delayed action on this matter at every opportunity. This year, DOE has again deferred conceptual design until fiscal year 2004 with fiscal year 2003 funding used to continue manufacturing concepts.

The Panel *consistently recommends* immediate action on conceptual design for a number of reasons. First, design and construction of this facility will take between 10 and 15 years. Even if the most basic conceptual design activities began today, this full-scale facility would not be ready at the earliest until April 2012.

Second, the facts are that our nuclear components are aging, and we have no capability to replace them. As the Panel's 2000 Report stated, "the missing production capabilities . . . leave us even more concerned about our ability to respond to crisis." The report continued, "we can significantly increase our readiness with relatively small expenditures on needed conceptual design."

Third, in this year's Foster Report, the Panel noted that, "Restoration of complete production capability has a strategic import. We can more confidently build down if we know that we can build back if necessary. Restored production capability might be the enabling condition for some future stockpile reductions."

With these factors in mind, the Foster Panel, for the third straight year, recommended that the "NNSA expeditiously produce an approved design, make a site decision, complete safety studies, and obtain environmental permits for pit production and secondary production facilities."

Mr. Chairman, it is time we heed the warning of the Foster Panel and direct the NNSA to immediately begin conceptual design of a full scale plutonium pit production facility. We owe it to our Nation as well as the security of future generations to do so.

Thank you, Mr. Chairman.

Dr. Beckner, Mr. Erickson, thank you very much. The hearing is adjourned.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JACK REED

COMPLIANCE WITH AGREEMENTS

1. Senator REED. Secretary Roberson, recently there have been press reports questioning the Department of Energy's (DOE) ability to comply with the various compliance agreements under the budget as requested for each site. If the Environmental Management (EM) program received the funding that has been requested, other than the cleanup reform funds, would the DOE be able to comply with all of its agreements other than the agreement with the State of Washington for the tanks at Hanford?

Secretary ROBERSON. I believe the base budget meets the legal commitments in our environmental compliance agreements. However, we can't continue to do business as usual under any funding scenario. We must be focused not only on meeting our legal commitments, but also on addressing our other environmental obligations to the communities and the American taxpayer. With the additional funding from the EM Cleanup Reform Account, we will be able to pursue cleanup approaches that will produce more real risk reduction, accelerate cleanup, or achieve much needed cost and schedule improvements, as well as maintain compliance with legal requirements.

2. Senator REED. Secretary Roberson, would the DOE have to renegotiate the various agreements and consent orders with the States and the EPA if the funding requested by the DOE for fiscal year 2003 is the amount authorized and appropriated for fiscal year 2003?

Secretary ROBERSON. If funds are authorized and appropriated consistent with our request, we would not anticipate the need for renegotiation of our legal agreements. However, our request is structured to provide an incentive for our sites and regulators to review the cleanup approach to ensure it is focused on reducing risks and accelerating cleanup. As a result of this effort, it may be necessary to work with DOE's regulators to modify the milestones and commitments in some agreements and orders to reflect new cleanup approaches.

3. Senator REED. Secretary Roberson, what are the DOE's liabilities if it intentionally asks for less money than is needed for environmental compliance?

Secretary ROBERSON. Compliance with environmental requirements is a primary consideration and high priority for the Department in formulating its budget request. The Department includes in its budget requests to the Office of Management and Budget sufficient funds to comply with applicable environmental requirements. Moreover, the Department generally is subject to the same types of enforcement actions, including fines and penalties in many cases, as private entities that fail to comply with environmental requirements.

OPERATING CONTRACTS

4. Senator REED. Secretary Roberson, over the course of the past 2 to 3 years, the DOE has renegotiated or entered into new contracts at almost all EM sites. These contracts were designed to provide incentives to the contractors to do more work with less money, but were all predicated on a predetermined funding profile. It now appears that one requirement for participation in the cleanup reform fund is to renegotiate or even recompete the existing contracts. Has the decision been made to terminate for convenience and recompete any or all of the existing contracts? What sites and what contracts are included in this decision?

Secretary ROBERSON. We have decided to recompete the Mound Site contract. We do not anticipate that a wholesale renegotiation of all current EM contracts will be necessary; however, most will require modification. Any decision to recompete a contract will be made on a case-by-case basis.

5. Senator REED. Secretary Roberson, has a cost analysis been conducted to determine that the cost savings achieved from recompetition exceeds the cost to terminate the contracts early?

Secretary ROBERSON. In making a decision to re-compete a contract, DOE would consider any additional costs that would be incurred should a termination for convenience be required. It can be difficult to estimate the cost of changing to the new contract. If the incumbent contractor wins the award, the current contract may be modified, and a termination action would not be necessary. If a new contractor wins the award, the incumbent contractor would present a termination for convenience proposal, and the government will audit it and negotiate a fair and equitable settlement. However, a decision to recompete is not taken lightly and is made to achieve specific results. A decision to recompete will be made for three possible reasons:

1. the current contract expires;
2. the desired or necessary changes are so significant that competition is warranted; and
3. confidence in and performance under the current contract is such that it does not appear that continuing the contract will render the necessary results.

6. Senator REED. Secretary Roberson, does the DOE have to modify the terms and conditions of some or all of these contracts if fiscal year 2003 funding is appropriated at the requested level?

Secretary ROBERSON. It may be necessary to modify existing contracts to reflect not only any differences in the funding level compared to anticipated levels when the contract was initially negotiated, but also to properly align the scope of work and performance incentives with the cleanup approach that results from our discussions with regulators.

7. Senator REED. Secretary Roberson, has this renegotiation process started?

Secretary ROBERSON. While some of our contractors have been involved in discussions and planning for accelerated cleanup approaches, we would not begin formal discussions to modify a contract until it is clear what the resulting funding appropriation level and performance requirements for fiscal year 2003 will be.

SURPLUS FACILITIES

8. Senator REED. Secretary Roberson, do you have any plans to stop taking contaminated surplus buildings and facilities from other components of the DOE?

Secretary ROBERSON. We do not have plans to stop taking contaminated facilities into EM. However, for those contaminated excess facilities currently managed by other programs, acceptance into the EM program will be a very conscious decision. Any additional facilities added to the EM program will be clearly identified and seg-

regated from the current baseline, cleanup costs and schedules for those facilities will be determined, and cleanup of those facilities will be prioritized according to the principles of the Top-to-Bottom Review.

9. Senator REED. Secretary Roberson, the budget request for fiscal year 2003 does not appear to include funds for EM to accept any new excess facilities, is this correct?

Secretary ROBERSON. In fiscal year 2003, the Tritium Systems Test Assembly (TSTA) at Los Alamos National Laboratory will transfer from the Office of Science to EM. The fiscal year 2003 budget request therefore for EM includes $460,000 for surveillance and maintenance for TSTA to support this transfer. No funding to decontaminate and decommission the facility is requested in fiscal year 2003.

EXISTING COMMITMENTS

10. Senator REED. Secretary Roberson, does the EM budget for fiscal year 2003 continue to fund previous commitments to manage newly-generated wastes?

Secretary ROBERSON. The EM fiscal year 2003 budget request continues to fund previous commitments to manage newly-generated wastes at Oak Ridge, Lawrence Livermore National Laboratory, and the Pacific Northwest National Laboratory. Although EM may consider negotiating the transfer of responsibility for newly-generated waste back to the generator program(s), the fiscal year 2003 congressional request does not assume these transfers.

11. Senator REED. Secretary Roberson, does the fiscal year 2003 budget request fund the new waste storage building at Lawrence Livermore National Laboratory, because our information is that the building has been completed but there is no money to move the wastes, which are currently stored outside, into the new building?

Secretary ROBERSON. Yes, funds are available within the Environmental Management fiscal year 2003 budget request for Lawrence Livermore National Laboratory to initiate movement of waste into the new waste storage building, focusing as a first priority on removal of low-level waste currently stored in temporary structures.

CLOSURE SITES

12. Senator REED. Secretary Roberson, the Closure Account was established to provide flexibility to sites that were closing by 2006 to accelerate the closure where possible. As we approach 2006 and those sites are closed, does it make sense to establish a new closure account for those sites that will be closed in the 5 years following 2006 and to allow those sites that will be closing in that time frame the same flexibility afforded to those sites closing by 2006?

Secretary ROBERSON. The fiscal year 2003 budget request was structured to provide incentives for DOE and its State and Federal regulators to reach agreement on new cleanup approaches to accelerate risk reduction and cleanup at all DOE sites. EM is making progress in our discussions with States. As of the end of May 2002, the Department has signed Letters of Intent with the appropriate regulators for accelerated cleanup of sites in the States of Washington, Tennessee, Idaho, New Mexico, and Nevada. We expect to sign letters for additional sites soon.

Once we have completed cleanup acceleration plans at the sites, EM intends to re-examine the EM budget structure and to propose changes as appropriate so that the budget structure will correspond to the new cleanup plans. We will focus on a structure that supports acceleration and ensure it supports the needed integration. We are considering appropriation accounts that align with site closures in our accelerated cleanup program.

MINI-NUKES

13. Senator REED. Dr. Beckner, there has been much recent discussion of mini-nukes. Is the NNSA working on anything, or have plans to work on anything, that could lead to a weapon (new or modified) that would be designed to produce a yield of less than five kilotons?

Dr. BECKNER. No. The NNSA has no validated requirement from the Nuclear Weapons Council to work on a new or modified weapon that would produce a yield of less than 5 kilotons.

14. Senator REED. Dr. Beckner, is NNSA working on, or is there money in the fiscal year 2003 budget to work on new concepts in weapons that could have application to conventional weapons?

Dr. BECKNER. The President's fiscal year 2003 request for stockpile stewardship is focused on ensuring the continued safety, security, and reliability of the Nation's nuclear weapon stockpile. Applications of nuclear weapons technologies to conventional weapons are, of course, possible, but the NNSA weapons programs focuses its funds on nuclear weapons activities.

TEST READINESS

15. Senator REED. Dr. Beckner, the NNSA has been criticized for having the ability to conduct a test in 24 to 36 months, even though this level of test readiness was approved by the Nuclear Weapons Council. The NPR directs the NNSA to improve its test readiness. What does a 24- to 36-month test readiness posture mean to you and how is it different from 20 to 32 months or 30 to 36 months or 18 to 24 months, and do these arbitrary time frames have any real meaning, i.e., does it make a difference what and how you test?

Dr. BECKNER. The NNSA, consistent with existing Presidential direction, is maintaining the ability to conduct a limited series of nuclear tests within 24 to 36 months of a Presidential order to do so. The purpose of this test readiness program is to identify and complete long lead-time items required to conduct a test, and to ensure that we maintain the key skills and capabilities that would be difficult to reconstitute. We have not identified a particular test and have not prepared specific devices or diagnostics in a test configuration.

The NPR raised several concerns about the current test readiness posture. The NNSA's ongoing study is reviewing: (1) the shortfalls or additional steps required to continue to meet 24–36 month readiness; and (2) the actions and resources required to shorten the test readiness posture to 18 months or less.

A 32-month program or 30- to 36-month test readiness program would differ little from the current posture. If the readiness time were shortened from 24 months to 20 or 18 months, the level of preparation would change. Substantial additional work would be required on long-lead items (field test neutron generators, authorization safety basis documentation and nuclear explosive safety studies) to ensure readiness. Some of these items are even required for 24 months (the short end of our current 24- to 36-month readiness) so we have begun to invest in those areas. Shorter times than 18 months would require the selection of a particular device to test and preparation of the device and diagnostics in a test-ready configuration.

We believe that 18-month readiness is achievable for well-defined tests of weapons currently in the stockpile. But, historically, even with a vigorous testing program, a complex experiment could take well in excess of 2 years to prepare, so 18 months would not be achievable for every conceivable experiment. It does matter what we test.

16. Senator REED. Dr. Beckner, to conduct a nuclear test requires certain skills and abilities. Have you identified all of the needed skills and abilities and a plan to maintain them and what elements of the Stockpile Stewardship Program maintain these skills?

Dr. BECKNER. Subsequent to the initiation of the current test moratorium, we have made a considerable effort to catalog and archive procedures, capabilities, and personnel requirements to conduct an underground test. Those skills related to fielding a test at the Nevada Test Site are maintained through the test readiness program and substantially exercised through the execution of the stockpile stewardship experimental programs, in particular subcritical experiments, hydrodynamic testing at the laboratories, and a broad range of other experiments at both the laboratories and the Nevada Test Site. These experimental programs address both the required test execution skills and the diagnostics. Laboratory and plant skills involved in preparation of a test device are exercised through stockpile maintenance and stockpile life extension activities. Laboratory design and test analysis skills are exercised through experimental programs. The nuclear diagnostics capabilities will be partially exercised in the High-Energy-Density Physics program, as methods and techniques are similar. The principal skills that cannot be exercised are containment, radiochemistry, and some aspects of high speed nuclear diagnostics.

17. Senator REED. Dr. Beckner, what is NNSA studying in the current review of test readiness and will this study include the costs of various options and the benefits to the Stockpile Stewardship Program of these options?

Dr. BECKNER. The NPR raised several concerns about the current test readiness posture. The NNSA's ongoing study is reviewing: (1) the shortfalls or additional steps required to continue to meet 24- to 36-month readiness; and (2) the actions and resources required to shorten the test readiness posture to 18 months or less. The results of this study will be shared with Congress once the administration has determined the best path forward.

While test readiness is a part of the stewardship program, we must carefully balance the available financial and human resources to ensure that the stockpile remains safe, secure, and reliable.

18. Senator REED. Dr. Beckner, is there any real value gained from conducting mock test exercises?

Dr. BECKNER. We are considering the use of exercises to enhance certain aspects of test readiness, primarily those areas which are not practiced through the execution of the stockpile stewardship experimental programs. We expect to conduct exercises of some portions of the nuclear test process, such as drill-back for radiochemistry samples. Larger exercises that approach something related to a full underground nuclear test remain under study. We must weigh the research and readiness benefits against the resource costs.

DISMANTLEMENT RATES AT PANTEX

19. Senator REED. Dr. Beckner, I believe there is some confusion about the ability of the NNSA's Pantex facility to dismantle nuclear weapons. I have heard statements that Pantex has no ability now and could not in the future have an ability to dismantle nuclear weapons because of the pressures the Stockpile Life Extension Program places on the Pantex Plant. Could you please explain what Pantex is currently dismantling and what is the potential ability of Pantex to dismantle nuclear warheads between now and 2012?

Dr. BECKNER. The current production complex is limited in the number of weapons that can be processed at the Pantex Plant, with the work split among units undergoing surveillance, refurbishment, or dismantlement. Planned renovations of existing facilities at Pantex will expand capacity sufficient to meet the anticipated Nuclear Posture Review workload. During the period fiscal year 2008 through fiscal year 2010, when three refurbishments (W80, W76, and B61) are underway, there would be a small reserve capacity available to address unanticipated problems in the stockpile, respond to new warhead production requirements, or handle a potentially increased dismantlement workload. That reserve capacity would increase after fiscal year 2014. Under current planning assumptions, NNSA would not define a firm schedule for dismantlements, rather it would "load level" the Pantex operation by scheduling dismantlements in a way that does not interfere with ongoing refurbishments or new production. Currently, Pantex is disassembling the W56 Minuteman II warhead (expected to be complete in fiscal year 2005) and the W79 Artillery-Fired Atomic Projectile (expected to be complete in fiscal year 2003). Pantex also has plans to disassemble some excess B61 bombs and all remaining B53 bombs in the next few years.

20. Senator REED. Dr. Beckner, could Pantex dismantle the W–62 between now and 2012?

Dr. BECKNER. The decision to retire the W62 warhead by 2009 was reaffirmed by the Nuclear Posture Review. No further decisions were made on dismantlement. With the currently planned workload at Pantex, including three new refurbishments and facility renovations, there is insufficient capacity to dismantle all the W62 warheads between now and 2012 without rearranging priorities. Instead some would have to be held in an "inactive" status in storage at either Pantex or in a military storage site until they could be dismantled.

EFFECT OF NPR ON THE STOCKPILE LIFE EXTENSION REQUIREMENTS

21. Senator REED. Dr. Beckner, the decision in the December 2001 NPR was to maintain all of the current stockpile of nuclear warheads. What does this decision do to the need to conduct life extensions on each of these nuclear warheads and the block approach?

Dr. BECKNER. The NPR which lays out the direction for this Nation's nuclear forces over the next 5 to 10 years reaffirmed NNSA's stockpile refurbishment plan (which includes the block upgrade approach) for the W87, W76, W80, and B61. The

plan had been approved by the NNSA and the Department of Defense. Therefore, no changes are required as a result of the NPR.

22. Senator REED. Dr. Beckner, what does this decision (to maintain all warheads) mean to the tritium supply?

Dr. BECKNER. The NPR does not change the current plan for the date when NNSA needs to begin irradiating tritium producing rods in the Tennessee Valley Authority's reactors. Irradiation will still begin in the fall of 2003 as currently scheduled, particularly because the initial core loads of tritium rods will be "transition cores" that will not contain nearly as many tritium rods as will be utilized for steady state production. The requirement to maintain a 5-year reserve has not been affected by the NPR. We have contracts with the TVA to produce tritium in the amounts required to support the NPR stockpile, whatever the details of that stockpile turns out to be.

23. Senator REED. Dr. Beckner, what does this decision do to the cost of the Stockpile Stewardship Program in the near and long terms?

Dr. BECKNER. The workload direction in the NPR is consistent with current assumptions and is reflected in the fiscal year 2003–2007 FYNSP document provided to congressional committees in March 2002.

NUCLEAR POSTURE REVIEW

24. Senator REED. Dr. Beckner, the committee has received testimony that the DOE and the DOD will continue to review the decisions made in the NPR. Is this or is this not the case?

Dr. BECKNER. Section 1041 of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (Public Law 106–398) required the Secretary of Defense, in consultation with the Secretary of Energy, to "conduct a comprehensive review of the nuclear posture of the United States for the next 5 to 10 years" and to report to Congress on the results of the review. The December 2001 NPR establishes our strategic posture for the 21st century, preparing America for a new and rapidly-evolving international security environment. As such, the NPR is a foundation on which more detailed planning can be based; NNSA and the DOD are jointly engaged in fleshing out the details. Thus, our focus is not on reviewing the decisions made in the NPR but in implementing them.

25. Senator REED. Dr. Beckner, would it be fair to characterize the NPR as a living document?

Dr. BECKNER. The NPR, per congressional requirement, reviewed the nuclear posture of the United States for the next 5 to 10 years. The review established our strategic posture for the rapidly changing and unpredictable world in which we now live. The NPR provides high-level guidance for planning the direction and makeup of the strategic forces and capabilities the U.S. will need to assure our national security through this decade. Again, our focus is not on reviewing the decisions made in the NPR but in implementing them.

26. Senator REED. Dr. Beckner, what are the next steps in the review process?

Dr. BECKNER. The DOD and NNSA will, in coming months, jointly address, among other things, the size and makeup of the stockpile needed to support a force of 1,700–2,200 deployed strategic warheads. NNSA will continue, as affirmed by the NPR, to maintain the nuclear stockpile through surveillance, refurbishment, production, dismantlement, transportation, and storage.

27. Senator REED. Dr. Beckner, is there a schedule to re-examine the decisions and to make decisions to retire warheads or to destroy warheads?

Dr. BECKNER. The President announced in November that the United States would reduce its operationally-deployed strategic nuclear warheads to between 1,700 and 2,200 over the next 10 years. Some of the warheads removed from operational status will become part of the responsive force. Some will no doubt be retired and dismantled. We will be making decisions on these and related matters in coming months and years. Among other things, the NPR reaffirmed the earlier decision to retire the W62 warhead by 2009.

ACTIVE NUCLEAR WARHEAD STOCKPILE

28. Senator REED. Dr. Beckner, can you define the inactive stockpile from the DOE perspective?

Dr. BECKNER. From the DOE perspective, the inactive stockpile are those warheads in DOD custody in order to augment the active stockpile, if necessary; to replace active stockpile warheads withdrawn for surveillance testing; and to replace warheads of a particular type, should there be a serious degradation in their reliability.

29. Senator REED. Dr. Beckner, how will the nuclear warheads in the inactive stockpile be maintained, modernized, and loaded with tritium?

Dr. BECKNER. All inactive stockpile warheads have their limited life components (e.g., tritium bottles) removed upon expiration and not replaced unless the warhead is returned to the active stockpile. Inactive stockpile warheads typically remain in DOD custody and are refurbished (modernized) on a case-by-case basis.

30. Senator REED. Dr. Beckner, how does the total number of nuclear warheads relate to the tritium requirement and when must the NNSA resume tritium production to support the NPR and how will the size of the tritium reserve be determined?

Dr. BECKNER. NNSA must support all operationally deployed and augmentation (responsive) warheads with tritium. Some augmentation warheads may be in the inactive stockpile, but we must have enough tritium to support them in the event they are brought back to the active stockpile. The remainder of the inactive stockpile warheads do not require tritium support. The DOD and NNSA have not yet determined the exact number of warheads that will be in the active and inactive stockpiles. While the changes in the force structure impact the tritium "need date" and, therefore, the number of tritium rods that must be irradiated in the TVA reactors, the fall 2003 initial irradiation date is not affected. This is particularly true in view of the fact that the initial core loads of tritium-producing rods in each TVA reactor will be "transition cores" that will not contain nearly as many rods as will later be utilized for steady-state production. The requirement to maintain a 5-year reserve has not been affected by the change in force structure in the NPR.

NEW NUCLEAR WEAPONS

31. Senator REED. Dr. Beckner, has the DOE been told by the Defense Department to work on the development of any new nuclear weapons?

Dr. BECKNER. The NNSA has no requirement from the Department of Defense to work on the development of any new nuclear weapons. Any new requirement to develop a new nuclear weapon would have to be approved by the Nuclear Weapons Council consistent with Section 3152 of the National Defense Authorization Act for Fiscal Year 1995.

32. Senator REED. Dr. Beckner, was this direction approved by the Nuclear Weapons Council?

Dr. BECKNER. If and when the NNSA is asked to work on the development of a new nuclear weapon it will be approved by the Nuclear Weapons Council consistent with Section 3152 of the National Defense Authorization Act for Fiscal Year 1995.

33. Senator REED. Dr. Beckner, is there money in the fiscal year 2003 budget request for this work?

Dr. BECKNER. For fiscal year 2003, the NNSA has no requirements from the Department of Defense to initiate any development activities, including the design of a new nuclear weapon. However, funds are included to maintain a capability to explore technical options that would enhance the security posture of the United States.

34. Senator REED. Dr. Beckner, how much will the DOE spend in fiscal year 2002 on development of any new nuclear weapons or new nuclear-weapons concepts?

Dr. BECKNER. While there are no funds in fiscal year 2002 for the development of any new nuclear weapon or new nuclear-weapons concept, the NNSA is planning to spend $7.4 million (of which $500,000 is from USAF) in fiscal year 2002 from Directed Stockpile Work R&D to conduct a 3-year study on the possibility of modifying either the B61 or B83, both existing warheads in the stockpile, to provide the United States with Robust Nuclear Earth Penetrator capability. This research activity will be carried out because current weapons in the stockpile cannot hold at risk

a growing category of potential targets: deeply buried in tunnel facilities, possibly containing chemical, biological, nuclear, or command and control facilities.

35. Senator REED. Dr. Beckner, there was no request for money for new weapons development in the fiscal year 2002 budget request. If 2002 money is going to be used to begin work that leads to the development of a new nuclear weapon, when will the Department submit a reprogramming request seeking congressional approval for this new effort?

Dr. BECKNER. There are no plans to use fiscal year 2002 funds for the development of new nuclear weapons. The Department is planning to spend $7.4 million (of which $500,000 is from USAF) in fiscal year 2002 from Directed Stockpile Work R&D to conduct a 3-year study on the possibility of modifying either the B61 or B83, both existing warheads in the stockpile, to provide the United States with Robust Nuclear Earth Penetrator capability. This research activity is within the scope for funds appropriated for stockpile R&D; however, we are also preparing a notification to congressional committees to keep them current and informed.

QUESTIONS SUBMITTED BY SENATOR JEFF BINGAMAN

ADVANCED CONCEPTS INITIATIVE

36. Senator BINGAMAN. Dr. Beckner, can you please explain what new warhead programs you are pursuing in the Advanced Concepts Initiative and how does this interface with the Nuclear Weapons Council requirements?

Dr. BECKNER. The NPR states that the number, composition, and character of the Nation's nuclear forces ought to reflect the reality that the Cold War is over and that nuclear deterrent capabilities may now need to be different. The NPR endorsed NNSA's Advanced Concepts Initiative that could provide the Nation with future options for meeting new or emerging requirements. This work also provides an opportunity for NNSA and its contractors to exercise critical skills necessary for the long-term sustainment of the Nation's defense.

The initial focus of the Advanced Concepts program will be the Robust Nuclear Earth Penetrator (RNEP), for which $15.5 million is requested in fiscal year 2003 as part of the Directed Stockpile Research and Development activity. This study was approved by the Nuclear Weapons Council, and in response to a JROC validated requirement. The 3-year RNEP feasibility study will assess the feasibility of modifying one of two candidate nuclear weapons currently in the stockpile to provide enhanced penetration capability into hard rock geologies and develop out-year costs for the subsequent production phases, if a decision is made by the Nuclear Weapons Council to proceed. This work complies with existing legislation, including Section 3136 of the National Defense Authorization Act for Fiscal Year 1994. The fiscal year 2003 budget contains no other funds for Phase 6.X advanced concept study activities.

ROBUST NUCLEAR EARTH PENETRATOR

37. Senator BINGAMAN. Dr. Beckner, regarding the Robust Nuclear Earth Penetrator, what specifically are you doing to the B83 bomb, are any of the warhead components besides the casing being modified, and could it eventually require testing?

Dr. BECKNER. The potential modifications to both the B61 and the B83, based on the limited analysis done in 1999 entail case modifications and structural reinforcement of various portions of the weapons package (nuclear explosive package and associated weaponization subsystems such as the bomb electrical system) to improve their impact survivability. The specific modifications required will not be known until the Feasibility Study (6.2) is completed. Guidance to the labs from the start has been that no envisioned modification can require an underground nuclear test to certify the modified weapon system. There will be no modifications to specifically alter yield.

A–76 PROGRAM AT ALBUQUERQUE FIELD OFFICE

38. Senator BINGAMAN. Dr. Beckner, why does the DOE have an A–76 program to reduce to Albuquerque Field Office when your reorganization plan is also reducing it and what staffing levels do you expect when all this is done?

Dr. BECKNER. President Bush has challenged all agencies to review functions that are not an inherently governmental function and subject them to an "A–76" review process, to assess whether these functions can be done more effectively and efficiently by the private sector. The functions that the DOE has identified for review

include information technology, human resources, and financial services. These functions are present at the Albuquerque Field Office.

We are supporting the overall crosscutting review of these functional areas throughout the DOE. We would expect that this review will feed into our reengineering efforts for the specific functions being reviewed under A–76. Until these reviews are complete the impact on staffing levels cannot be determined.

LONG-TERM WASTE MANAGEMENT RESEARCH AND DEVELOPMENT

39. Senator BINGAMAN. Secretary Roberson, who is going to conduct the long-term waste management research and development?

Secretary ROBERSON. The Department's Office of Science (SC), that has been partnering with EM on this activity since 1996, will conduct the basic research that addresses the environmental cleanup mission. We believe this will result in more efficient research management and better leveraging of other basic science tools within SC. SC and EM will continue to work closely to ensure the research supports cleanup as it evolves.

40. Senator BINGAMAN. Secretary Roberson, I understand it may be the Office of Science, but will the reduction in funds from your office be transferred to the Office of Science or will they pick up an unfunded mandate?

Secretary ROBERSON. No, in developing the fiscal year 2003 budget request, funds were effectively transferred from EM, so that SC will not acquire an unfunded mandate. The request for the Environmental Management Science Program, which now appears within SC's budget, fully satisfies funding commitments on multiyear projects that extend into fiscal year 2003. However, it does not provide for any new research projects.

41. Senator BINGAMAN. Secretary Roberson, will you continue to use the National Academy of Sciences for outside scientific peer review of the waste management program?

Secretary ROBERSON. Yes, it is the Department's intent to continue to commission the National Academy of Sciences for outside, independent reviews on environmental scientific and technical matters.

CLEANUP AT SANDIA

42. Senator REED. Secretary Roberson, as recently as 2 years ago in its fiscal year 2001 budget request, the Department of Energy committed to finish the cleanup of the Sandia National Laboratories site in New Mexico by the end of fiscal year 2003. This year's DOE request is silent on the issue of a completion date. It appears to me that DOE plans to extend the cleanup date indefinitely. As you know from your experience at Rocky Flats, delaying cleanup schedules is in the long run more expensive than applying the extra resources needed to get the job done on schedule. Could you please explain why the Department has backed away from its commitment to clean up the Sandia site, and why the Department believes this is a cost-effective approach?

Secretary ROBERSON. Please be assured that the Department of Energy is fully committed to the cleanup of the Sandia National Laboratory (SNL), as well the other large cleanup project in New Mexico at the Los Alamos National Laboratory.

During the past 2 years, SNL has aggressively pursued the excavation of several major landfills. During these cleanups, additional quantities of contamination than what were thought to be present were discovered. This type of uncertainty is unavoidable at landfill excavations regardless of how thoroughly the landfill is characterized. Because of this increase in the scope of the project, the fiscal year 2003 cleanup completion date for the Sandia site that you referred to could not have been achieved.

One of the recommendations included in the Top-to-Bottom Review is to "accelerate the closure of small sites." On May 30, 2002, the Department, the State of New Mexico officials, and EPA signed a Letter of Intent that establishes goals and identifies activities that would complete cleanup at Sandia National Laboratories by 2006.

QUESTIONS SUBMITTED BY SENATOR STROM THURMOND

INFRASTRUCTURE PLAN FOR NUCLEAR WEAPONS COMPLEX

43. Senator THURMOND. Dr. Beckner, Section 3008 of the National Defense Authorization Act for Fiscal Year 2002 requires the Secretary of Energy to prepare an

infrastructure plan for the Nation's nuclear weapons complex. Although the report is not due for some time, what is your current assessment of the adequacy of the complex to support the current and future nuclear stockpile requirements?

Dr. BECKNER. NNSA's ability to support the nuclear weapons stockpile depends upon renewing industrial and engineering capabilities across the complex. Much of the infrastructure of the national security enterprise was built during the era of underground nuclear testing, and has eroded to the point that we are no longer able to perform some essential tasks. The President's fiscal year 2003 budget address supports our industrial base in two key ways: a request of $1.7 billion for Readiness in Technical Base and Facilities, a 10 percent increase supporting the operations of weapons complex facilities; and, a $243 million request for the Facilities and Infrastructure Recapitalization Program to continue this important multiyear initiative into its third year to help restore the weapons complex.

44. Senator THURMOND. Dr. Beckner, the Department of Defense uses the Installation Status Report to identify the condition of its facilities. What are the DOE's installation measurement tools?

[Dr. Beckner did not respond in time for printing. When received, answer will be retained in committee files.]

SERVICE CENTERS

45. Senator THURMOND. Dr. Beckner, the Department plans to eliminate a layer of management and oversight by establishing eight site offices collocated with the eight NNSA contractors. How will these eight offices differ from the field offices that the Department previously used to manage operations?

Dr. BECKNER. As described in the "Report to Congress on the Organization and Operations of the National Nuclear Security Administration, February 25, 2002," the NNSA is significantly changing its field structure. In the past, operations offices managed, on behalf of NNSA, field offices whose basic role was operations, particularly occupational safety and nuclear safety. Most other functions in support of Defense Programs were performed within the operations offices and headquarters. A primary change will be that the field offices will assume a role in overseeing the execution of programs. Another significant change will be the further empowerment of the site manager through delegation of significant contracting authorities. On the other hand, operations offices will transform into service centers, whose job will be to provide support to the field offices and the weapons complex more broadly, primarily in administrative, financial, and contracting areas. These and other changes will be clearly mapped through an extensive re-engineering activity, now underway, which will complete this fall.

WORK FORCE

46. Senator THURMOND. Dr. Beckner, you testified that the Department is aggressively starting a program to retain highly-skilled employees, retrain employees with skills mismatches, and recruit the right technical skills. What programs does the Department have to recruit graduate students who will be the seed corn for developing and maintaining U.S. nuclear weapons technology?

Dr. BECKNER. The DOE/NNSA has two programs that are utilized to employ college students and graduates. The Career Internship Program (CIP) and the Student Career Experience Program (SCEP) are critical to NNSA work force recruitment and retention efforts. CIP is utilized more throughout the weapon complex as it is designed to employ recent college graduates in scientific and engineering entry-level positions. The program trains and develops the interns in special skills and knowledge that are required to fill critical positions such as weapon program engineers and weapon program management. These positions have the responsibility to develop and maintain the U.S. nuclear weapon technology.

Weapon program engineers oversee all aspects of the development, production, and modifications of components in support of the Nation's nuclear weapon stockpile. Program management positions oversee the day-to-day construction of the facilities to include reviewing and approving engineering plans and specifications for NNSA owned nuclear and non-nuclear facilities. The CIP ensures that DOE's corporate structures and functions are learned through a comprehensive training program, which includes rotations through offices in nuclear weapons, program management, and environmental safety and health. These rotations can be between 2 to 6 months in duration, thus allowing the interns to work on projects and shadow senior engineers and scientists. Another important program is the SCEP. This pro-

gram allows student to be employed during 2 years of college and allows for conversion to a full time federal position after graduation. The students are given projects and are encouraged to shadow technical staff.

47. Senator THURMOND. Dr. Beckner, in its recruiting efforts does the Department of Energy face the same anti-military sentiments on some university campuses as the Department of Defense? If so, what are your suggestions on how to overcome this problem?

Dr. BECKNER. The DOE's corporate recruiters face anti-government sentiments on college campuses across the Nation. In light of the terror attacks, DOE is focusing its recruitment strategy and building on the Nation-wide sense that serving the Government is honorable and noble. Our office is exploring a partnership with the new non-profit organization "Partnership for Public Service." The organization is dedicated to recruiting and retaining excellence in Federal service. The organization encourages qualified men and women to choose Federal service for some or all of their career.

MODERN PIT FACILITY

48. Senator THURMOND. Dr. Beckner, last year this committee expressed great concern about the lack of progress being made with regard to a Modern Pit Facility. The Panel to Assess the Reliability, Safety, and Security of the United States Nuclear Stockpile, or simply, "the Foster Panel," provided striking evidence that we must take aggressive action in this regard. In fact, in both the 1999 and 2000 reports, the Foster Panel made as its most significant recommendation that the United States must "Immediately begin conceptual design of an adequate pit production facility." In response to this compelling evidence, this committee included in the report accompanying the Fiscal Year 2002 National Defense Authorization Act the following guidance: "The committee notes the panel's estimate that it will take 10 or more years to build an adequate pit production facility. The pending NPR is expected to outline such critical concerns as the size of the future arsenal and mix of weapons. . . . Conceptual design should proceed at the conclusion of this study to facilitate a timely decision on facility construction." Furthermore, the committee recommended "an additional $10 million be available to select an architect-engineering organization to begin the conceptual design and report process, in order to keep the new pit production facility on schedule." Unfortunately, your fiscal year 2003 budget calls for the design of this facility to be "deferred until fiscal year 2004 with fiscal year 2003 funding used to continue manufacturing concepts." Do you disagree with the findings of the Foster Panel with regard to a Modern Pit Facility?

Dr. BECKNER. NNSA is currently taking steps to proceed with an MPF including formal approval of mission need, Critical Decision-0 (CD–0), which is required to start conceptual design of a MPF. Following CD–0 approval by the Department, anticipated yet this month, the NNSA will initiate a National Environmental Policy Act (NEPA) process to obtain a formal Record of Decision that is required to both select a site for an MPF and to proceed with a detailed facility design after completing conceptual design. The NNSA will expedite the NEPA process while simultaneously developing technology required to evaluate conceptual designs for an MPF.

49. Senator THURMOND. Dr. Beckner, why was the design of the Modern Pit Facility deferred to fiscal year 2004?

Dr. BECKNER. Although the Senate Armed Services Committee recommended an additional $10 million in fiscal year 2002 for the MPF, only $4 million was appropriated. Based on this $4 million appropriation and consistent with direction provided by the Senate Armed Services Committee, the NNSA has completed pre-conceptual planning activities and is prepared to start conceptual design of an MPF following approval (spring 2002) of Critical Decision-0, mission need.

NEED FOR MODERN PIT FACILITY

50. Senator THURMOND. Dr. Beckner, in 1996 the DOE called for developing a contingency plan to establish a large scale pit manufacturing facility within 5 years. Does your research on the deterioration of nuclear components support your decision to delay the 1996 plan? Do you have new evidence contradicting the concerns of the Foster Panel with regard to the "worrisome signs of deterioration in some nuclear components?"

Dr. BECKNER. Research to date on plutonium aging and pit lifetimes does not show significant deterioration that would raise concern about the safety, security,

or reliability of the Nation's nuclear deterrent. The weapons laboratories are continuing to conduct experiments at the laboratories and the Nevada Test Site to further improve our understanding of the lifetime of nuclear components such as pits. At the same time the NNSA is proceeding, on a prudent pace, supported by the Nuclear Weapons Council, with plans to develop a Modern Pit Facility that will meet the needs of the nuclear weapons stockpile.

NNSA is aggressively monitoring the aging phenomenon through the core surveillance program and enhanced surveillance campaign. An ambitious refurbishment program to replace some of the components of the weapons systems that have higher risk to safety or reliability has been instituted. These life extension programs (LEPs) have extremely high priority and management attention at NNSA, the design laboratories, and the production plants. As a direct result of input from the core surveillance program and the enhanced surveillance campaign, the strategy and tactics for the LEP implementation have been focused to address the concerns of an aging stockpile.

MIXED OXIDE FUEL FABRICATION FACILITY

51. Senator THURMOND. Dr. Beckner, last year you assured me that the mixed-oxide (MOX) plant was your top nonproliferation priority. Thank you for all you have done with regard to moving this program forward. However, a few matters need to be resolved in order to guarantee the success of the program. Specifically, I have been informed that you are currently negotiating with the Governor of South Carolina to achieve a mutually satisfactory agreement for the DOE and South Carolina. While a number of my colleagues addressed this matter at today's hearing, it was my understanding that this agreement may require legislation. Do you believe that it would require legislation to implement it?

Dr. BECKNER. The administration supports a legislation approach designed to assure the people of South Carolina that there will be a path for surplus plutonium to be shipped to its Savannah River Site. The administration considers Section 3182 of S. 2514 adequate to achieve this objective.

52. Senator THURMOND. Dr. Beckner, would you please provide suggested legislative language? As this is a time-sensitive matter, could you accommodate this request immediately?

Dr. BECKNER. The Department supports the legislation introduced by Congressman Lindsey Graham and Senator Strom Thurmond. I believe that this legislation addresses all of the concerns the State of South Carolina has raised regarding the plutonium disposition program.

CURRENT PLANS FOR MOX FABRICATION FACILITY

53. Senator THURMOND. Dr. Beckner, you are no doubt aware that a MOX lead test assembly (LTA) program is needed before the Nuclear Regulatory Commission (NRC) will approve the use of significant quantities of MOX fuel. The initial plan for the fabrication of these units—fabrication at LANL—was terminated by the DOE in May 2000, reportedly due to cost and schedule concerns. I have been informed that there is a possibility that there may be a lag between the MOX fabrication facility startup and large scale use of MOX. The potential startup delays would mean that large scale use of MOX fuel would not begin until 2012, 2013, or later. Consequently, the lag between MOX Fuel Fabrication Facility and full production requires maintaining the facility with no production for a number of years, a cost impact to the taxpayer of potentially $200 million. Can you detail the current plan as well as the schedule of that plan? Can you assure me that there will be no delay due to LTA approval delays?

Dr. BECKNER. The options for fabrication of MOX lead assemblies are still under consideration. One option the Department is currently examining is the early fabrication of MOX lead assemblies in Europe. The Department is meeting with European Government officials to determine the necessary measures to pursue this option. Detailed plans will be developed if an agreement can be reached by all parties.

If successful, lead assemblies will be fabricated and irradiated before the completion of the MOX Fuel Fabrication Facility, and the Department's contractor, DCS, should be able to obtain Nuclear Regulatory Commission approval for large-scale use of MOX fuel in the Duke energy reactors on the desired schedule.

I am optimistic that there will be no significant delays in Nuclear Regulatory Commission approval of the lead assemblies. However, it is simply not possible to guarantee that there will be no delays as the Nuclear Regulatory Commission exer-

cises its statutory responsibilities to confirm the safety of the use of lead assemblies in licensed reactors.

FULL-TIME MANAGER

54. Senator THURMOND. Dr. Beckner, I believe it would be helpful and assuring to have a DOE manager to take charge of the MOX fuel LTA project on a full time basis to perform DOE activities, coordinate interagency activities, such as Department of State, Department of Defense, etc., as well as oversee contractor activities. I also believe a full time manager could open and maintain a dialog between the United States, France, and Belgium, initiate National Environmental Policy Act activities, and prepare an export license application to the Nuclear Regulatory Commission. Do you believe these activities could be better managed by a full-time manager, and if so, will you support creating such a position?

Dr. BECKNER. The Department has assigned a full-time engineering manager at headquarters with the primary responsibility for lead assembly activities. One of the priorities for this position involves coordinating lead assembly activities and maintaining communication between the various agencies and contractors involved in this effort.

ACCELERATED CLEANUP

55. Senator THURMOND. Secretary Roberson, I fully support the Department's initiative for accelerated cleanup of the DOE sites. My concern is that you will not have sufficient resources to fulfill all the expectations. What assurance can you provide us that once the additional $800 million allocated for the program has been committed, you will be able to obtain additional funding to support the program?

Secretary ROBERSON. The administration is prepared to support a request for additional funds, up to $300 million, if needed for cleanup reform. I am personally committed to the success of this initiative to refocus and accelerate the cleanup and will work within the administration and with Congress to ensure that the Department receives the funding that is needed to carry out agreements that will successfully accelerate risk reduction and cleanup.

56. Senator THURMOND. Secretary Roberson, what is the status of the program in regard to the Savannah River Site?

Secretary ROBERSON. The Department has developed a number of specific initiatives for the Savannah River Site that could potentially be funded from within the cleanup reform appropriation. These initiatives would enable a significant acceleration in the timetable for completion of EM's cleanup work at the site with a corresponding significant reduction in risk and in the overall cost of cleanup. We have been discussing these initiatives with state officials and their Citizen's Advisory Board. In parallel, we have developed a draft performance management plan in support of implementing the accelerated cleanup program to effectively manage this work. We are working closely with State and Federal regulators to reach agreement on an accelerated cleanup plan, and I am optimistic we will reach that agreement soon.

QUESTIONS SUBMITTED BY SENATOR JIM BUNNING

PUBLIC LAW 105–204 [1]

57. Senator BUNNING. Congress passed P.L. 105–204 in 1998. The intent of the bill was to ensure that the construction of DUF6 conversion facilities would be built at two sites, one at Paducah and one at Portsmouth, and that by 2004 cleanup of the DOE's depleted uranium hexafluoride would be completed. The DOE has now decided not to select a contractor for this project and to delay the selection until October 2003 to study whether two facilities are necessary. I know that the OMB has refused to provide funding for this project. I believe that two facilities are necessary to eliminate the hazardous waste at the sites. Will the intent of P.L. 105–204 be followed by constructing two DUF6 facilities, one at Paducah and one at Portsmouth?

[1] S. 2316, "A bill to require the Secretary of Energy to submit to Congress a plan to ensure that all amounts accrued on the books of the United States Enrichment Corporation for the disposition of depleted uranium hexafluoride will be used to treat and recycle depleted uranium hexafluoride."

Secretary ROBERSON. After careful consideration of options, the Department has decided not to make a selection decision or to award the contract to design, build, and operate DUF6 conversion facilities at both the Paducah and Portsmouth sites at this time. Rather, the Department plans to consider alternatives in the number and location of conversion facilities before continuing with the evaluation of proposals and subsequent award of a contract. We plan to make that decision by January 2003.

58. Senator BUNNING. Secretary Roberson, the DOE's new tactic with the contractor selection process appears to make it impossible to finish construction of the DUF6 facilities by 2004. Do you think construction of a DUF6 facility will ever begin and when do you think it will commence?

Secretary ROBERSON. By January 2003, the Department plans to announce its decision as to the number and location of DUF6 conversion plants. DOE will evaluate its schedule requirements for construction as a part of its consideration of the number and location of plants.

59. Senator BUNNING. Secretary Roberson, in the President's fiscal year 2003 budget, the Paducah cleanup fund received $73.4 million, which is $20 million less than the fiscal year 2002 appropriated amount of $93.4 million. How do you plan to finish cleanup at the Paducah Plant in a timely manner if funding continues to be cut?

Secretary ROBERSON. The Department is committed to cleanup of the Paducah site, and is working to identify ways to achieve more risk reduction and accelerate the cleanup. We do not view the fiscal year 2003 budget as a budget cut for the Paducah site or for any other DOE sites. The total budget request of $6.7 billion, including the $800 million requested for EM cleanup reform, is approximately equal to fiscal year 2002. Furthermore, the administration is willing to support up to 5,300 million more if needed for cleanup reform. We have structured the budget in a manner to provide the necessary incentives to revise the cleanup strategy at our sites to achieve an accelerated risk reduction strategy. The budget includes funding to continue ongoing cleanup work until an agreement on a revised cleanup strategy is reached. Once a new strategy is defined, we intend to provide additional funds as appropriate to those sites.

Based on the results of the Secretary's Top-to-Bottom Review, the Department is developing an accelerated cleanup approach for the Paducah site that could significantly accelerate risk reduction. We are working with the Commonwealth of Kentucky and the EPA's Region IV on the proposal and, upon agreement with the regulators, the Paducah site would be eligible for additional funds from the EM cleanup reform account to implement the agreement. In addition, we will continue to look for ways to reduce costs and accelerate schedules through the use innovative technologies, fixed price contracting and improvements in project management.

60. Senator BUNNING. Secretary Roberson, do you plan for the Paducah Plant to be part of the DOE's proposed Accelerated Cleanup Program, and if so, how will this affect the time line for cleanup at the Paducah Plant, and if the Paducah Plant becomes part of the program, will it remain a cleanup priority for the DOE?

Secretary ROBERSON. Yes, the Department has proposed an accelerated cleanup strategy for the Paducah site and, upon agreement and joint commitments by the regulators, the site would be eligible for additional funds from the EM cleanup reform account to ensure successful implementation of the strategy. This strategy, if accepted by the regulators, could complete EM's current cleanup scope of work at Paducah as early as 2006. Discussions with the State and U.S. Environmental Protection Agency are continuing.

[Whereupon, at 4:30 p.m., the subcommittee adjourned.]

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 2003

THURSDAY, APRIL 11, 2002

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

INTELLIGENCE, SURVEILLANCE, AND RECONNAISSANCE PROGRAMS

The subcommittee met, pursuant to notice, at 2:30 p.m., in room SR–222, Russell Senate Office Building, Senator Jack Reed (chairman of the subcommittee) presiding.

Committee members present: Senators Reed and Allard.

Majority staff members present: Madelyn R. Creedon, counsel; Kenneth M. Crosswait, professional staff member; Creighton Greene, professional staff member; and Christina D. Still, professional staff member.

Minority staff members present: Charles W. Alsup, professional staff member; L. David Cherington, minority counsel; and Brian R. Green, professional staff member.

Staff assistants present: Thomas C. Moore and Nicholas W. West.

Committee members' assistants present: Elizabeth King, assistant to Senator Reed; and Douglas Flanders, assistant to Senator Allard.

OPENING STATEMENT OF SENATOR JACK REED, CHAIRMAN

Senator REED. Let me call this hearing to order. The Strategic Subcommittee meets this afternoon to receive testimony on the intelligence, surveillance, and reconnaissance (ISR) programs of the Department of Defense. We will conduct this hearing in open and closed sessions. At the conclusion of the open session, we will adjourn and reconvene in room S–407 of the Capitol for the closed session.

Our three witnesses today are the Honorable John Stenbit, Assistant Secretary of Defense for Command, Control, Communications, and Intelligence (C^3I); Lieutenant General Gregory Newbold, Director of Operations for the Joint Staff, (J3); and Rear Admiral Stanley Szemborski, Deputy Director for Resources and Requirements for the Joint Staff, (J8). Welcome, gentlemen, and thank you for joining us this afternoon.

Secretary Stenbit is responsible for enabling the military forces of the United States to use and share the information gathered by the formidable collection of intelligence, surveillance, and reconnaissance assets at our Nation's disposal. This is a difficult and extremely important task.

General Newbold serves as the operational link between the commanders in the field and the National Command Authority. His responsibilities include positioning military forces, monitoring worldwide military conditions, and conducting operational briefings for the national leadership.

Admiral Szemborski is the deputy in charge of the analysis and requirements developments arm of the Joint Staff. We have asked Admiral Szemborski to provide his insights into the current and future requirements for ISR systems.

The ISR assets of this country have been instrumental in the prosecution of Operation Enduring Freedom in Afghanistan, while continuing to support the wider needs of the Department of Defense and the intelligence community. They have performed very well, the Predator unmanned aerial vehicle (UAV) being one of many high profile examples of success. Operation Enduring Freedom has also, however, demonstrated some of the limitations of the Nation's ISR assets when they are stressed and exposed in crisis.

Following September 11, when the requirements for airborne surveillance were stretched beyond the limit of our current Airborne Warning and Control Systems (AWACS) fleet, our NATO allies came to our assistance. The NATO AWACS aircraft maintained surveillance over the United States helping to guard against further terrorist strikes when our aircraft were sent to support operations in Afghanistan. The attack of September 11 itself tragically revealed that despite all of our ISR capabilities, significant weaknesses remain in our ability to detect and prevent the actions of terrorists acting alone or in small groups.

We welcome all of our witnesses today and thank you for being here. Thank you also for your service to the country and to your respective service. Each of you is important to ensuring that the necessary ISR assets are in place, delivering information where and when needed. This hearing is an opportunity to discuss both our ISR strengths and weaknesses, and to ensure we are making the most of the former while improving on the latter.

Senator Allard, at this time would you like to make an opening statement?

STATEMENT OF SENATOR WAYNE ALLARD

Senator ALLARD. Yes, Mr. Chairman, I join you in welcoming the three distinguished witnesses from the Department of Defense, and applaud your forward thinking in holding this important hearing. Mr. Chairman, before I get to the formal part of my statement, I wanted to congratulate you on sticking to a very ambitious subcommittee schedule. I know how difficult it is and appreciate the fact that you have been fighting for times and dates to hold all these hearings. You have done a good job with your leadership of this committee, and I also appreciate your commitment and dedication to the subcommittee's work.

When I think about my responsibilities on the subcommittee, we deal with nuclear programs, space and intelligence programs, and all those other uncontroversial items. So seriously, Mr. Chairman, while we do not always agree on these issues, I do want to publicly acknowledge you and acknowledge the working relationship that we have here.

Also, I would like to acknowledge both our staffs for all their hard work over the last week to prepare these hearings. It is their dedication that allows these hearings to go as well as they have. So, to the staff—the professional staff and staff assistants and personal staff—a big thank you.

Now, to get to the subject of this hearing. We are all thankful for the initial success of our forces in Afghanistan, and around the world in this global war against terrorism. While much will be debated in the months and years ahead about the relative value of airpower, seapower, and ground operations in Operation Enduring Freedom, one thing is clear: All our forces are dependent on timely, accurate information to succeed. The ISR assets available to the theater and subordinate commanders have done a remarkable job in delivering that information.

We have often heard our civilian and military leaders in the Pentagon talk about the importance of information superiority in future warfare. We have now seen a pragmatic demonstration in Afghanistan. This has not always been the case.

During the 1990s, the regional commanders in chief (CINCs) routinely acknowledged that they had significant concerns about the availability of ISR assets to support both their peacetime and wartime operations. Most of these concerns were focused on airborne reconnaissance assets, the manned and unmanned aircraft with various intelligence sensors that are allocated to theater commanders. The numerous global requirements combined with the very limited numbers of these aircraft led to their being designated as high-demand, low-density (HDLD) assets, requiring special intensive management by the Pentagon.

Recently, Secretary Rumsfeld stated that the very existence of the term high-demand, low-density assets means that our priorities were wrong, that we didn't buy enough of what we needed. Based on the testimony of the regional CINCs and various intelligence officials, Congress directed the Department of Defense to assess the adequacy of its ISR assets in fiscal year 2000. The Joint Airborne Reconnaissance Assessment, completed in 2001, concluded that additional assets were in fact needed, including additional Joint Surveillance and Target Attack Radar System (JSTARS), Rivet Joint, and EP–3 aircraft, and a well-defined unmanned aerial vehicle architecture.

Similar reviews of our national intelligence needs have also been undertaken, examples are the NIMA and NRO commissions. All have recommended changes and enhancements to our overall ISR capabilities at the tactical, operational, and strategic levels. Our purpose here today is to better understand this complex ISR enterprise and determine if the investments we are making are adequate.

Furthermore, we want to understand if the policies associated with these very essential and special assets are appropriate to en-

sure our warfighters and our national decision makers have the best possible information. Finally, we need to hear what progress you have made in implementing the prudent recommendations made by these various assessments and commissions.

The world has been amazed at pictures of soldiers on horseback directing 21st century weapons with devastating precision. We see images of AC–130 gunships firing at ground targets identified by unmanned aerial vehicles. We see silhouettes of parachutes, through night vision goggles, descending on distant airfields.

How did we find these targets, these threats to our national security? How will we know if Saddam Hussein plans to attack his neighbors again, or if al Qaeda terrorists begin to congregate in new locations? The answers to these questions reside in having a capable, well-coordinated ISR system. This is our first line of defense and it must detect current and future threats.

I look forward to hearing our panel's testimony on the performance of our ISR systems, especially in support of Operation Enduring Freedom and the global war on terrorism. I am also most interested in their view of the future, of what our ISR system needs to be prepared for. What gaps or challenges may be anticipated, and what can we Congress, do to help?

As we consider the fiscal year 2003 budget request, we must be mindful of the critical role information superiority plays in our current and future military operations, and how intimately connected our ISR assets and weapons systems have become. This is clearly the future of warfare. We must ensure that our ISR systems continue to be the best in the world. Thank you, Mr. Chairman.

Senator REED. Thank you very much, Senator Allard, not only for your statement but for your very kind words. Let me say that it has been a pleasure working with you, and your effort together with your staff has been absolutely critical to meeting a very demanding schedule of hearings. If there is any praise, it has to be shared equally, and I thank you very much.

Senator ALLARD. Thank you, Mr. Chairman.

Senator REED. Secretary Stenbit, you are free to proceed.

STATEMENT OF HON. JOHN P. STENBIT, ASSISTANT SECRETARY OF DEFENSE FOR COMMAND, CONTROL, COMMUNICATIONS, AND INTELLIGENCE

Mr. STENBIT. Senator Reed, it is a pleasure to meet you and have the opportunity to be here this afternoon. Senator Allard, it is my pleasure to see you again. I appreciated your support in our hearings back not quite 9 months ago, when I was, in fact, before the committee for confirmation.

I would like to summarize a bit of the big picture of where I am coming from. The closed statement for the closed session, which I have submitted, has some more details in terms of the answers to the questions that you asked. But it is always important in my mind to share also the context in which I am working. So with that, I will do a brief, open summary.

First, I think it is important to recognize that the Secretary has identified three clear priorities, one of which is to deter and prevent other occurrences of terrorism against the U.S. and our interests wherever they are in the world. His number two priority is to

improve the flow of information and intelligence and to make sure that these things are transformed. Then third, he talks about the transformation of the entire Department.

I am happy to say that the goals that I have in my world are clearly aligned with all three, but in particular the last two. In that sense I too have basically three goals. I really want to get the Department to a network-centric view of the world, and I will describe that in a second.

If I ever get us to a network-centric view of the world, I need to populate the network with good information. Then third, if I ever did both of the two, I need to make sure that we protect that information and protect the network, at the same time making sure we can keep somebody else from doing the same thing to us. So those are my three goals: Create a network, populate it with information, and make sure that we can depend on it and that nobody else can. That sounds, perhaps, a little simple but let me see if I can elaborate a bit.

Point number one, with respect to the network, I was in the Pentagon in a job very close to the one I have now, 25 years ago. In those days in the communications business it was a telephone system. Somebody found something out from any kind of a system, whether it was a person, airplane, or whatever, in effect they had to dial up through a telephone system to tell somebody what they found.

If you think about that for a while, that does not work because the person who is dialing needs to know the total state of the universe. He needs to know who might be interested in the information he has. What is their phone number? Who are they? How fast do they need it, with what kind of precision and so forth?

We struggled mightily in that kind of a world because that was the technology we had in those days. We ended up with some really big problems, not the least of which was the ill-fated Pueblo capture in North Korea where we found out 4 days later that there were actually Marine Corps aircraft that were available that could have gone and intercepted that particular issue within the allotted time, but not 4 days later. We had a similar issue where the Israelis gave us 24 hours to move a ship off of their coast or they were going to sink it. It took us over 24 hours to get the order back to move, and when we got back there it was a wet order.

So, those telephone-based systems just did not work. The key to all of this is that we adjusted and we made it all work by having the bureaucracy that found a target to be the bureaucracy that shot it. There just wasn't enough coordination capability to be able to separate those two—with the one exception of Strategic Air Command (SAC). When SAC was handed targets, they put together a war plan for the Air Force and the Navy, and it took 18 months. If we changed our mind it took 18 months.

That is not an acceptable tactical environment, to wait 18 months to change the idea of who is going to shoot what target. In the intervening 25 years we have made a tremendous step forward with this general issue of distribution of information by going to broadcast means. Today, if you go into any active area, there are global broadcast systems, there are defense dissemination programs, there are multiple kinds of broadcast systems.

If you think about a broadcast system, what it does is it allows that person who finds something out not to have to know to whom they may need to send the data. All they have to do is get it on the broadcast, because it is going to be broadcast to everybody and people who are interested will listen more than those that are not interested in it. That is the way our systems work today.

It has held us in good stead. It came to fruition in the Persian Gulf War environment, and it really has come into fruition here recently. So, when we talk about a Predator we are talking about TV that is seen in multiple places around the world at the same time, including multiple places in Afghanistan, in the theater of operations. That is the broadcast, if you wish. The guy driving the Predator does not need to think about whom he must tell if he sees something. It is a broadcast system.

Now, that leads to a whole bunch of things that we spend a lot of money and time on these days, called fusion centers. Because, the key here is that as you are listening to a broadcast in whatever form it is, mostly satellite-based, it gets broadcast. It gets broadcast once and then that is it. So you had better be listening to all the broadcasts at the same time, and then you had better be able to fuse together the information—this one, and that one, and this other one. Perhaps that is through intelligence. Perhaps that is by Service. Perhaps that is from different countries.

But the point is we then gather all these broadcast sets of data, multiple channels if you wish, it is like when you watch football games on Sunday afternoon, you would like to have a TV that had six little boxes so you could see all of them at the same time. I mean, that is fusion. That is NFL fusion.

The problem with that is we still have a very complex set of folks who decide what is important and what is not and then pass it on. They have to do it in real-time. Where I would like to go in a network world, is a pull-world, where everybody has access into a—think of it as an Internet—where the bandwidth is not a constraint, that it is a reliable system that people count on, that it is trustworthy, and the data are available whenever and wherever you want.

You can call it power to the edge if you wish. That is one of the phrases I use. But the edge in this case is whoever does not know what they do not know, and they have a problem. They need to go find out what is available. They need to be able to reach out wherever they go to find it.

Creating such an environment is one of the major transformational goals of both my office and the Department. We have in front of you, in the fiscal year 2003 budget, significant investments in laser-based communications, both on the ground and in space, to create the beginnings of this network. That is point number one, create a ubiquitous, trustworthy, dependable network where bandwidth is not a problem and people can, in fact, get the information they want wherever they are, whenever they need it.

As I said, if you are going to do that you have to then put information on that network. There I would like to make two points. One, I cannot prove this, but my impression over the last 7 months, looking at what has happened over the last 15 years or so in the ISR business, in the information gathering business, in the

secrets stealing business, is we have not covered the depreciation of our assets, if I were to use a business term.

Every time we use a secret to do something we start the process of somebody avoiding having that happen to them again. As such, there is a depreciation over time in the value of the information we gather, no matter what we do about it, because the more we use it the more people get used to our using it and the more they tend to avoid it. There are real businesses out there that warn people these days about when satellites are coming overhead, for example.

So, one of the things we need to do to populate this network is to get back to the investment in new ways to steal secrets. This is not the appropriate forum for that, at this unclassified level, but there is a lot of money for programs in the 2003 budget to start this process of what I call recapitalizing the accounts to go steal secrets.

Second, we can use the information we already have better. There is a lot of information that is available that is not on the network today. So one of the things I am trying to push is procedural changes. One of the big ones has to do with ISR, where there is a buzzword called TPED, task, process, exploit, and disseminate. I would like to turn that on its head and not use that word anymore. I would rather use a word I have invented which is TPPU, task, post, process, and use.

By that, I mean anybody who has anything to say posts it to the network first, and then go process it. Somebody else might actually want to do something with it in addition to you. We actually had this the other day. We are making some progress, I am happy to say. Joanne Isham, who is the deputy at NIMA, came over and said, "I have done it. I have done it. I am in your network world."

Somebody from CENTCOM called up and complained because they had called the NIMA analyst to help them with this image, to interpret it, and the NIMA analyst had not looked at it yet. So we are in this post before we process mode and that is good, because somebody at CENTCOM was able to have a different priority, a different tolerance for ambiguity or whatever, and was able to use the information.

So with respect to populating the network, I think there are two things we need to do. We need to basically invest in the recovery of the depreciation of our ability to steal secrets. We need to post all the information we have so that we do not lose it in the flow. That applies equally to the business side of the Pentagon, no question about it. That is not only a targeting issue.

The third, which is the protection of the systems that create the network and find the information, we have put resources in—for instance, to increase the jam resistance of the GPS satellites—the 2003 program. We have become very dependent on the GPS satellites. We might as well treat it as if we really need it and start to invest as if it really needed to be there. We need to do that for information assurance and some other issues with respect to the network and crypto-modernization. But more importantly, we also need to move forward with information operations to make sure we can preclude somebody else doing that to us.

So that is the context that I deal with these issues. My closed statement goes into some more detail. I would be happy to answer

questions as we move forward. But thank you for the opportunity to give you my big picture.

Senator REED. Thank you very much, Mr. Secretary. I would note that General Newbold and Admiral Szemborski have a combined statement. But I presume that both of you would like to testify this afternoon, so let me turn to General Newbold first.

STATEMENT OF LT. GEN. GREGORY S. NEWBOLD, USMC, DIRECTOR OF OPERATIONS, J3, THE JOINT STAFF

General NEWBOLD. Sir, thanks, also we are honored to be here this afternoon to have an opportunity to testify. I would like to submit our statement for the record.

Senator REED. Without objection.

General NEWBOLD. Just a quick comment, sir, you have indicated the position I occupy is a linkage between the combatant commanders, the warfighters, and Washington. The role involves the distribution of assets, in this case very scarce and precious assets: intelligence, surveillance, and reconnaissance platforms.

We have had some wonderful successes in Afghanistan, but we can expand it beyond Operation Enduring Freedom to successes in virtually every corner of the world, including the United States. We have also revealed some additional requirements, or some weaknesses. We have grown and adapted as we have learned quite a bit about our own systems and how we use them.

The future is as Mr. Stenbit indicated, but we have to be agile enough to adapt today. I think we have shown some of that and we need to show a good bit more. So, our job in the operations department is to ensure that we are not content with the present and can adapt to the future. I look forward to questions, sir, and the opportunity to try and address them. Thank you.

Senator REED. Thank you very much, General. Admiral Szemborski, your comments.

STATEMENT OF REAR ADM. STANLEY R. SZEMBORSKI, USN, DEPUTY DIRECTOR FOR RESOURCES AND REQUIREMENTS, J8, THE JOINT STAFF

Admiral SZEMBORSKI. Mr. Chairman, Senator Allard, I am honored to be here today before this distinguished subcommittee. Thank you for the opportunity to discuss intelligence, surveillance, and reconnaissance. In my current assignment, I am responsible to the Chairman of the Joint Chiefs, General Myers, for requirements, acquisition, and also the program budget system. My job is to try to keep all three of those processes rolling in the same direction.

In that assignment, I spend quite a bit of time working on bringing programs to the Joint Requirements Oversight Council, or JROC. I look forward to testifying today and I will forgo the rest of my oral statement. I am prepared to answer any of your questions. Thank you.

[The combined prepared statement of General Newbold and Admiral Szemborski follows:]

COMBINED PREPARED STATEMENT OF LT. GEN. GREGORY NEWBOLD, USMC, AND REAR ADM. STANLEY SZEMBORSKI, USN

Members of the Senate Armed Services Strategic Subcommittee, we are pleased to provide this statement regarding the status of our Intelligence, Surveillance and Reconnaissance (ISR) assets and their importance to the breadth of our military operations. We will address two general areas that I believe require particular attention: first, the means by which we allocate ISR assets among competing requirements; and second, the importance of the systems that process, analyze, and forward collected intelligence to our combatant forces.

We must first thank Congress for its sustained support to our Armed Forces. This committee's support has been instrumental in our forces' impressive performance in recent operations. Your continued support is instrumental to our efforts in the war against global terrorism.

Intelligence collection, analysis, and dissemination are more critical to operations today than ever. We rely on timely, comprehensive information collection complemented by rapid analysis and high speed distribution to optimize force employment. The 21st century has seen the warfighter's need for intelligence expand and delivery times shrink. Today, timeliness of intelligence is as important as its accuracy. Many of the targets we now face are small, mobile, and well concealed. Their fleeting nature often affords us scant opportunity for targeting. Successful ISR translates into proper use of precision weapons, focusing maximum destructive efforts and minimizing collateral damage.

We utilize a scarce inventory of intelligence collectors ranging from national collection capability to airborne platforms such as the Air Force U–2, Rivet Joint and Predator UAV, Navy EP–3 and P–3, and Army Guardrail and Airborne Reconnaissance Low (ARL), to ground-based collection and processing capability. We remain concerned about the effects of a sustained high operations tempo on the force and about shortages of ISR assets. With congressional support, the Department continues to address critical readiness concerns, (e.g. RC–135 Rivet Joint number 17 plus TC–135 and two RC–135 flight simulators, Predator systems numbers 6 through 12, and EP–3 numbers 12 through 16). As we address current ISR shortages, we are working to maintain an appropriate balance between near- and long-term readiness initiatives through incremental improvements which serves as a hedge against both near-term readiness shortfalls and failures of unproven technologies as we pursue more radical technologies to transform our forces for the 21st century. A case in point are our UAVs.

UAVs have validated their potential in Afghanistan for reconnaissance and surveillance and have demonstrated potential for an increased role in combat missions. We are continuing to experiment with additional roles and missions for these vehicles, improve their communications reach-back capabilities, and develop and acquire them at greater rates. The President's 2003 budget funds a number of transformational programs designed to help meet the objective. $141 million is funded to accelerate development of UAVs with new combat capabilities. $629 million is funded to procure three Air Force Global Hawk high-altitude unmanned vehicles and accelerate improvements such as electronics upgrades and better sensors, and begin development of a maritime version.

The President's 2003 budget also funds a number of transformational programs to address intelligence tasking, processing, exploitation, and reporting requirements. One such investment is $136.5 million for the next-generation joint ground system Automated Intelligence, Surveillance and Reconnaissance System.

In the discussion of intelligence gathering, one must not overlook the critical contribution of human intelligence (HUMINT). Quite often, HUMINT proves to be an invaluable source of intelligence, unmatched by any other source.

Our ISR forces provide support across the globe and are in extremely high demand. ISR support is usually the first request to come from the Combatant Commander. In addition to Operation Enduring Freedom, we are currently supporting Balkan operations, Operations Northern and Southern Watch, Korea, and operations in support of our forces in South America. These assets also help maintain awareness of potential threats in other areas around the globe. Most ISR assets are characterized as Low Density/High Demand—requirements exceed the current availability of platforms and/or personnel. AWACS, U–2s, and RC–135s are all examples of LD/HD assets.

We seek to balance unified commanders' ISR requirements with sustainment of long-term capabilities. We achieve this through global military force policy or Service-specified employment limits that set limits for the maximum pace of operations that can be sustained without imperiling an asset's ability to train or surge for contingencies. These limits help decision-makers better understand the costs of employ-

ing these assets. As you may expect, post-September 11 operations have pushed some of our ISR LD/HD assets into maximum surge levels. To mitigate shortfalls in low-density/high-demand airborne ISR assets, the Department created, implemented, and is now refining a revolutionary process for matching intelligence requirements with existing airborne ISR assets during steady-state peacetime operations and emergent crises. The new methodology focuses on satisfying the commands' highest priority information requirements and allows us to assess various allocation options and the risk associated with requirements that cannot be met with available assets.

This new process involves four distinct steps: First, each command identifies information requirements and submits them to the Joint Staff. Second, those requirements are prioritized based on criteria linked to existing policy directives and Joint doctrine. Third, all requirements undergo review from the Defense Intelligence Agency (DIA), National Security Agency (NSA), and National Imagery and Mapping Agency (NIMA) for potential satisfaction by other, non-airborne collection means. Fourth, the resultant prioritized requirements are matched to existing ISR assets based on a hierarchical system.

Where appropriate, we actively coordinate the use of allied platforms in lieu of U.S. capabilities. In addition, since September 11, we have deployed some assets outside their traditional role to satisfy unmet ISR tasking, freeing up other ISR assets.

Employing the proper sensor at the right place is only part of the challenge. Just as important are the systems and personnel that support the transformation of raw sensor data into actionable intelligence. All systems must provide a comprehensive, flexible, and supportive analysis and dissemination architecture that gets our forces the information they need, when they need it. This doesn't come automatically. The communications channels that get information to the analysts and back out to the warfighter and the priorities assigned to this analysis effort must be well thought out before it is needed. Accurate and rapid interpretation of intelligence is a highly refined skilled that can take years to develop.

Your continued support is imperative to the success of our ISR efforts. Our reliance on ISR capabilities, critical to today's operations, will only grow in the future. We look forward to your questions regarding the status of our ISR forces today and impact on current operations.

Senator REED. Thank you very much, Admiral. Let me begin a round of about 6 minutes, and then turn to Senator Allard.

The Air Force plans on procuring some 50 Global Hawk unmanned aerial vehicles in the coming years, and this is something on which our committee has been very supportive. In fact, Senator Warner has been particularly encouraging in this regard. So we would commend the Air Force for this. In addition, the Navy now appears to be interested in acquiring a variant of Global Hawk.

Each Global Hawk can gather a large amount of data, but typically all that data has to be sent via satellite to remote ground stations for processing, which raises the question, Mr. Secretary, can you tell us how you plan to ensure we have the satellite communications capability we will need to support the Global Hawks and other UAVs we plan on buying in the coming years? Is this capability, the satellite capability, properly phased with the UAV acquisition program which, as a final point I might add, seems to be accelerating rapidly with every Service and every contractor?

Secretary STENBIT. Let's see, to go to your last question first, of course it's not properly phased but it's actually not that bad for a poor reason. I was chagrined to read in *The Wall Street Journal* yesterday a front page article talking about this subject. I was relatively pleased that somewhere around September 13 we actually did go out and have a competitive bid with CNN for satellite services. At that time, we obtained and still have today 500 megahertz of additional commercial channels which we use quite effectively to move the data from the Predators and other ISR assets in the theater. So, we were fortunate and it was part of the plan at the time

that we would use surge capacity within the commercial satellite world.

I think if we were to look at that plan today, seeing the financial stress—that is probably a kind word for the long haul telecommunications business—we would have to be less optimistic today that things like Iridium, ICO, Teledesic, AstroLink, CyberStar, and all of those programs that everybody thought were going to launch in the next 5 years will actually get there. So, part of the problem of the phasing over the next several years that the assumptions of how many companies will go bankrupt were too optimistic.

On the other hand, the good news, which is not very good at all, is that that meant there was excess capacity. We were able to get 500 megahertz and we have. In fact, we put in play the ability to continue those services through the transition of the fiscal year. It is interesting to note how awkward our funding mechanisms are compared to businesses, because we have to do it by fiscal year, by appropriation, and making the peanut butter and jelly come out right is sometimes difficult.

But we believe we are in good shape at approximately the level we are at now. We are going to launch three satellites called "wideband gap fillers" over the next 3 years, starting in 2004, 2005, and 2006. Those are follow ons to DSCS, which is the existing military wideband satellite, which has nowhere near enough capacity to handle Global Hawks and Predators and things like that.

The wideband gap fillers have a lot more capacity. They have added one more frequency which is called the Ka-band, which is up at about 20 gigahertz, probably too much detail. But in any case, because it is a higher frequency, it has wider bandwidth and it can handle more information.

In my summary of my statement, I talked about the use of laser technology, both on the ground and in space, as a transformational issue with respect to where we want to go. This is really for the end of the decade. But I was happy you asked the question because I think that is an extremely important issue.

The commercial telecommunications people have learned how to put multiple colors of light down a fiber. So if you want some more bandwidth you add a color. It is called dense-wave division multiplex. We intend to equip about 90 facilities in the Defense and intelligence departments over the next 2 years, one color per facility. That is 10 gigabits per second. That is called an OC–192.

We want to go to an all-optical, very wideband, as global as we can, ground-based network. The money for that is in the request. Half of it is in the request for 2003, and it is called the Global Information Grid Bandwidth Expansion program.

We intend to use that same technology in space. By that I mean building laser crosslinks and laser communications to read from the Predator up to the satellite, laser from the satellite over to another satellite, and then a laser back down to the ground and into this network. Without doing that I think we will never solve the problem that you just described.

I was at a review of that program the other day. They are making progress at bounding how many laser heads we can put per satellite and still maintain the communications capacity. It looks as

if that particular transformation is going to be well within the technical state of the art and also feasible with respect to time and money.

So, I believe we are moving forward and this network that I was describing is fundamental to the question you just asked. Because not only do we need the bandwidth, we need the people to be able to process the information. We cannot spray that all over the world in small little clumps. It just will not work.

So part of the real advantage of this TPPU or the issue of building this network, is we can exfiltrate that data to wherever we need it. Then people can retrieve it as if it were an Internet, back through the same lasers and up to a radio in space and back down to their work stations. So we think that is probably the most transformational thing we can do in the Defense Department, let alone in the ISR world.

Senator REED. Thank you, Mr. Secretary. Related to your comments, Admiral Szemborski, you would, I assume, be responsible for the Joint Chiefs' developing the requirements first for the number of UAVs, and second how that is tied into the satellite architecture. If that is the case, can you comment upon this process and the requirements?

Admiral SZEMBORSKI. Yes sir, the JROC has taken this on and over the last several years they have commissioned several studies, both in the satellite area and the UAV area, in trying to bring this together. We have been very involved in what the C^3I staff is doing and we continue to assess it. We have also designated one joint warfighting capabilities assessment team, or JWCA team, to specifically look at this area.

That team has been assigned over the next year to do a complete assessment and do an operational concept for this area. We believe that by starting with the operational concept and then going to an architecture below that, we will be able to identify the key communications nodes and the key interoperability requirements that will allow us to take a step forward to a more integrated infrastructure in the future. The JROC started this a couple of years ago with the JTAMDO organization, the Joint Theater Air Missile Defense Organization, for cruise missile defense. The benefits of that have just been tremendous so far.

So with this effort that is going on right now, we believe that we will be able to really get a handle on the architecture of the future, be able to then hand that operational architecture over to the smart folks in C^3I to be able to do the technical architecture. With that, bring together something that we think will lead to a much better capability for the warfighter in the future.

Senator REED. Thank you very much. Senator Allard.

Senator ALLARD. In laying out this integrated ISR architecture, it looks to me like we have a huge task ahead of us. We have land, sea, and air, and then we have space on top of that. Then we have the tasking, the processing, and the communications parts of it. It is going to be a substantial undertaking.

But I am not discouraged because I see things that are encouraging. Mr. Stenbit, what is your assessment of progress being made in development and implementation of this integrated ISR architecture?

Secretary STENBIT. As I said, I think that the use of broadcast capability, and that is really what I did when the Air Force requested, and DISA did it, and I got my approval about the money, to get these satellite channels. I mean, we are now used to going into this broadcast mode. If we were not used to it and if we had not distributed common ground station programs to do interoperable analysis of it, and we did not have the wherewithal to use such information, we would have been dead.

Senator ALLARD. Talk to me a little bit about the institutional barriers, the stovepiping and that kind of thing that may add to complications.

Secretary STENBIT. I want to refer that to General Newbold, but my view is that the ISR assets, whether they are Service by Service or whether they are space or air or under the water or on top of the water, or whether they are intelligence or not, are actually being used in an integrated way. There is a process that is run by General Newbold that tiers those assets between that which is appropriately done at the theater level and that which is more appropriately looked at at a higher level.

Actually, my personal observation is, given that we do not have enough of some of the things we would like to have, the allocation is done through a process which General Newbold is responsible for that looks to me like it works pretty well. It is not that we do not have disagreements, but there is a good management process to work them out.

Senator ALLARD. Lieutenant General Newbold.

General NEWBOLD. Sir, I think the point is a very valid one. I think stovepiping seems to be human nature and we have to overcome cultural obstacles that lead to that dynamic. I think we are doing a good job of that. Things like Goldwater-Nichols made a step toward the cultural shift by making people understand things beyond their realm.

We have to go beyond that as well. We slowly adapt to the potential of new systems and platforms. Predator is a good example but there are other ones. I would like to think that with the advent of Joint Forces Command (JFCOM), the way in which we support the warfighter encourages people to break down some of these barriers within the Department of Defense that would mean that the information does not get to the warfighter as rapidly as they might.

I would submit as well, sir, that outside the Department of Defense, particularly with some of the other agencies in town, we have probably been more integrated than we ever have been in the past. Not good enough yet, very clearly, but I am in nearly daily communication with the Central Intelligence Agency, as an example. But I or my people are also in daily communication with the FAA, with the FBI, and the alphabet soup of other agencies. We are growing in this, but I think I would be dishonest if I did not say that those stovepipes still exist to some degree.

Senator ALLARD. Let me move to commercial imagery. This year there was a proposal to include additional funding for commercial imagery in the budget request. I am concerned that perhaps we are not committed enough to going ahead with the commercial side as to what is happening in NIMA. It seems to me a fair amount of that can be contracted out. Does the administration still believe

that encouraging the development of second generation commercial imagery satellites is important? Then the follow-up question would be, do you think these satellites could represent a useful ISR capability?

Secretary STENBIT. Let me start from the budget request. We have come to the conclusion—which is not quite the question you asked, but let me at least say where we were—we would like to take value-added products from the industrial base that use commercial imagery as their source, as opposed to using our imagery as their source, and not do this middle-man thing, which is buy the picture and then hand it to somebody else to make a map.

So where we are headed with the money that is on the table, and I believe that NIMA is with the program, is we are moving towards using the commercial imagery base as the source for value-added products, which are basically maps, charts, the TPED data base, and the program which I can never remember the old acronym nor the new one, but it is basically the computerized representation of the earth.

It has turned out as well that some of the images coming from commercial satellites have been used for ISR purposes as well. So, that has been an interesting surge capability, but I think that probably is not the long-term stable way to use the industrial base. Now, do they need a second generation set of imagery satellites in order to provide the maps with the precision that we need is a technical issue? Certainly at the level where we have the job today, we can already do it with the existing systems.

So, we are going to count on the existing systems being at least as good as and perhaps better into the future in order to accomplish this goal of having the value-added services come from commercial satellites.

Senator ALLARD. Are you talking about the existing systems within NIMA or existing commercial systems?

Secretary STENBIT. No, no, no, existing commercial systems. Maybe I over-listened to what you said.

Senator ALLARD. No, you are right.

Secretary STENBIT. We do need at least as good as we have now, but we are fully capable and have processes to accept now, through a measured process, that somebody can deliver maps at the required accuracy to meet the NIMA requirements. NIMA is now prepared to have people bring their processes forward to evaluate them, to do the quality control, and then take the maps from those people. So what we are trying to do is to get the people that do the processing of the images to make the maps or the charts, buy the commercial images from the companies, and that we end up with the maps. Because that is what we are after. We are after the maps, not necessarily the picture.

That is where we are headed. That is the plan. We have a lot of money programmed both into the 2003 budget but also into the out years to really execute on that.

Senator ALLARD. Thank you for your clarification of your answer. Mr. Chairman.

Senator REED. Thank you, Senator Allard. General Newbold, Senator Allard in his opening comments touched upon the issue of these low-density, high-demand assets, for example JSTARS and

other systems. Could you outline for us which ISR platforms were classified or would be classified as low-density, high-demand during Operation Enduring Freedom?

General NEWBOLD. Yes sir, the fact that we are using them in Operation Enduring Freedom leads them to have a global deficiency, so we look at it globally. Among those platforms, the two that trouble me the most are the AWACS and the U–2. The AWACS because, frankly we did not anticipate we would need 15 AWACS in the defense of the continental United States. We have been fortunate to have the NATO AWACS supplement our requirements there.

In the case of the U–2, it is not so much the platforms as the crews that are in short supply. We are about to alleviate that stress to some degree by bringing some of those assets home. We have other platforms that are in a surge or in fact even beyond the surge stage, above max-surge stage. They include things like the Rivet Joint aircraft, the RC–135.

We have used more Predator systems than we had available at the beginning of the conflict. Of course, Global Hawk is still a developmental system, so the fact that it is deployed in a developmental status is straining the system. Other platforms include JSTARS, EP–3s, all of them used in innovative ways, non-traditional ways, in deployments that have exceeded the peacetime metrics. That is a main point I would like to emphasize in my response.

When we establish metrics for low-density, high-demand assets we did it to be able to sustain the deployment of these assets during peacetime. So while our terminology is that we are above a surge capacity in those, in wartime the pilots, the maintainers, those that source them like a Service, and in fact the warfighting CINCs, all recognize that in wartime much of the traditional terminology that applies to surge status does not apply anymore.

We have been able to maintain aircraft beyond our expectations, probably through the hard work of individuals. We have been able to keep assets deployed and people deployed more than we would on a peacetime basis. Over time, this will all cause us to pay a price.

Fortunately, we have some more platforms that have been either requested, sir, that you have authorized, and over time will have less strain on the system. Of course, rising expectations may mean more requirements, but in essence we have a complete spectrum of assets that are in surge status. We are managing those and we will change the way we distribute these in the future.

Senator REED. Thank you. Mr. Secretary, following on the General's comments, over time you are going to have to develop a plan to address these surge assets. Could you give us an idea of your thinking in that regard now?

Secretary STENBIT. There is actually quite a lot of activity, as I said, in the fiscal year 2003 budget and also in the planning for the out years, where in each of the cases that we were faced with in the Defense Emergency Reserve Fund (DERF) request and in the supplemental request and then the fiscal year 2003 budget, many of these kinds of questions come up about do we buy more of the

old ones or do we get on with transforming to the new ones? We did our best to come to those kinds of conclusions.

For instance, in the Rivet Joint case, the JCS wanted two of the old ones as fast as possible. We, not for bureaucratic reasons but I think for good sound reasons, split the baby in half and bought one old one and said the first new one is going to get there as fast as possible. That then begs the question about what platform does it go on? Is the platform the same for the Navy and the Air Force or can they be on different platforms?

Those issues are really very vigorously under debate at the present moment. There is no question in anybody's mind that we are going to recapitalize the aircraft carriers of the ISR, and it will be a commercial system that has commercial kinds of maintenance and support issues. So we are not talking about whether we are going to build one or use a commercial version. Is it a 767? Is it a 737? Is it two of them? How does that go? What is the relation to the tankers, et cetera?

Those are very real questions that cannot be answered instantaneously. But from my point of view, in the how do you put the things inside those airplanes that make them work, we have some major issues that we have been moving forward for a while. One is an upgraded radar which is called RTIP, and that is programmed to go into Global Hawks and other platforms and in the new ones as well.

In the airborne SIGINT world we had a failure in the low-band subsystem and we are currently running a competition between the Army and the Air Force to determine which will be the lead Service to go get that thing back on track. But we do have a high-band system that can be the basis of an architecture to move forward. So, we are moving forward as the requirements are moving and as the platform choices are being made to make sure that there are the appropriate sensors and communications that go in those aircraft.

Senator REED. Thank you, Mr. Secretary. Let me ask one more question and then turn to Senator Allard for his round. General Newbold, I understand that the Services are the organizations which nominate these systems or these platforms to go on the list of low-density, high-demand assets. As a result, I am also told that the EP–3, which you mentioned, is not on the formal list, which raises the question: Are the Services the appropriate entities to make these nominations? Might it not be the CINCs or might it not be some other agency within the Department of Defense that could better do that?

General NEWBOLD. I'd like to provide a couple of comments in response. One of them is a very specific one, sir, and that is on the EP–3. The EP–3 has been nominated recently by the Navy to be an HD/LD platform.

But the essence of your question is do we have a central authority who will look more broadly to establish what is in short supply or not? It could be, as a matter of fact I would submit, that it probably is the Joint Staff who has to take a more active role in management. In truth we have since September 11, sir.

We need to formalize the expanded role that we have undertaken since then. The Services will always have an appropriate role in that. They have texture that we do not to the wear and tear on in-

dividuals because, sir, what goes into establishing the strain on a system is not only the degree to which we can sustain the platform, but the air crews. Beyond the air crews to the maintainers of the aircraft. For example, on the U–2 when we will upgrade the sensor package, and on the RC–135 when we will complete the engine rebuilds on those or replacement of the engines on that.

So, I think it is a combination, sir. The Services have a role that we cannot duplicate. We need to take a more active role in defining the requirements from the CINCs, and probably in a collaborative way, sir, we will come up with a better system.

Senator REED. Thank you very much.

Senator Allard.

Senator ALLARD. Where do you see the gaps in our ISR capabilities; and apply those to your fiscal year 2003 budget proposal. Where do you think the greatest shortfall might be in the fiscal year 2003 budget proposal? Lieutenant General Newbold, it looks like you are first.

General NEWBOLD. Yes, sir, I noticed that.

Senator REED. You have been nominated.

General NEWBOLD. The gaps—I am an authority—probably a surprise sir, first of all I'd like to mention something and then I will get to the detailed question as it relates to the ISR platforms. HUMINT, human intelligence, probably preoccupies my thoughts as much as any platform. I think there have been some notable improvements, and the Secretary of Defense has some initiatives under way to improve DOD capabilities in that regard. But, to supplement the enormously expanded capabilities we have in the air, space, and ground-based technology, there are some things we cannot accomplish, and human intelligence in that regard, native or U.S., has to be a robust capability.

So, the obvious one beyond that in the technological realm is the UAV. A grand success story, not only in Operation Enduring Freedom in Afghanistan, but of course before that going all the way back to the Persian Gulf War and to the Iraq units that surrendered to one to Operation Allied Force in Kosovo with the first use of the Predator. They have been invaluable in Afghanistan.

Gaps and seams result from the paucity, the relative scarceness of those. That is being addressed, but there is a significant demand from the other combatant commanders in chief for UAVs in their areas, whether they are European Command, Southern Command, Pacific Command, and in fact in the United States. So, I would call the UAVs a gap which is being corrected.

I would say that some of the satellite platforms, the fragility of that system concerns me a bit, sir. The airborne platforms, I think Mr. Stenbit talked about the replacement of the platforms themselves, not just the systems that go on them. I would like to start off with those off the top of my head, sir, and then pass it back.

Senator ALLARD. Well, I am not at all surprised about your comments about HUMINT, considering what has happened over the last 3 or 4 years. But if you look at the 2003 budget, in your view, what do you think are the key shortfalls that we have, and please just pull one out that strikes you as perhaps a mistake that we should better fund.

General NEWBOLD. Sir, the 2003 budget is addressing adequately things like the UAVs. As a matter of fact, I think Admiral Szemborski will tell you that the production line is at capacity with the 2003 expectations. Frankly, sir, I think the 2003 budget has done a good job of addressing the shortfalls in a reasonable way. Applying more money to some of the systems would not result in a cure.

On the HUMINT side, the problem there, as you know better than I do, is the time it takes to grow capability. Although money is applied, it can take up to 5 years to have a reasonable expectation of a good capability on the ground.

Senator ALLARD. We understand there is increased funding for UAVs, and also DOD has created a UAV planning task force. Can you share with this subcommittee the charter of this task force and what do you expect it to achieve?

General NEWBOLD. I am going to see if Admiral Szemborski is looking my way, sir. Stan, are you?

Admiral SZEMBORSKI. Yes, let me start out by saying in the area of ISR, several years ago the JROC commissioned the ISR JWCA team to conduct a study called the Joint Airborne Reconnaissance Assessment. That assessment was completed before September 11, but the primary recommendations out of that assessment were that 18 Rivet Joints and 16 EP–3s are required to really source our assessment of what we needed in those areas. That was the primary recommendation.

Between what was submitted in the fiscal year 2002 supplementals and the fiscal year 2003 budget, we have submitted requests for those platforms to come on line. Now we are in the process of reassessing that entire study right now, post-September 11. We expect that that study will be completed around the July time frame.

Now as far as UAVs go in this task force, there is a task force that has been formed by OSD in C^3I to start that and we have teamed our JROC members with that study so that we can together assess where, from an operational and a technical standpoint, we can go with UAVs in the future. We are very much with C^3I in that effort and expect in the next several months we will be able to come up with some conclusions from it.

Secretary STENBIT. It is not only C^3I, it is AT&L as well, because basically they worry about the platforms and we worry about what goes in them. But to get to your first question, in my opening statement I told you what I thought the big gap was, which is we have failed to spend money to recapitalize the depreciation on new ways to steal secrets. There is quite a list that is inappropriate at the open level to go through, but in the fiscal year 2003 budget and with some kicking off earlier in fiscal year 2002 through the DERF, we really did fund some of these new ideas. I would be happy to talk about that in a slightly different context.

Almost all of the decisions on which I participated in the fiscal year 2003 budget came—went and looked down these items—some of them where we needed more of what we already have, we have talked about some of those. There were some satellite cases that have gone into the DSRP where the Defense Department felt that we needed more than what would have naturally have come out of

the National Foreign Intelligence Program (NFIP), for instance. We put the money in for those.

In the case of—whether it was UAVs or whether it was some of these other new systems, we really took a hard look at what would it take to do a reasonably aggressive program, but not be getting ourselves into too much of an over-hasty view of what we could accomplish. There is a lot of effort moving into addressing shortfalls in the sources of information.

But I must second what General Newbold said about the human aspects, and I am not talking about the analyst part and I am not only talking about people out in embassies and doing spying. There are a lot of things that we need to be doing with people on the ground that we have not done as much as we should have. That is another big area where there is funding provided.

Senator ALLARD. The Chairman has been very gracious with my time and I appreciate that. I want to wrap up with this question: You talked about your interest in maps as opposed to images, and my question is how will we get these commercial products without commercial imagery satellites? Are we going to be using satellites that are built and operated by American companies or foreign companies? How do we establish that?

Secretary STENBIT. We cannot do it without the commercial satellites. The intent is that the infrastructure of people that NIMA has and their rather broad base of contractors who can, in fact, manipulate images to do maps. They used to do that by taking our pictures and doing it.

What we are trying to do is to get them to go to Iconos and the newly launched one, which I forget the name of, which are both American-based and get their source material from those two companies. So the answer is yes, we definitely need the commercial imagery sources to do what I said. What we are trying to do is not buy the pictures and hand it to somebody, but let them buy the pictures.

Senator ALLARD. Thank you. Thank you, Mr. Chairman.

Senator REED. Thank you, Senator Allard. We have now concluded the open session of the hearing. The record will remain open until close of business Monday for any questions for the record that any members may wish to submit. We will adjourn and reconvene in S–407 in 10 minutes. Thank you.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR BEN NELSON

CYBER ASSET PROTECTION

1. Senator BEN NELSON. Secretary Stenbit, we have learned that China, North Korea, Iran, Iraq, and other nations are attempting to develop cyber-attack capabilities that could threaten our military's information technology on which many of our surveillance assets are based. Where do we stand on development of a more robust system to protect these assets and what is in this year's budget request that will help get us there?

Secretary STENBIT. A cyber-attack on our military's information technology would not affect our surveillance assets. The systems that control the surveillance operations are tightly controlled and completely isolated from any outside connection that could provide a cyber-attack access to the system. In addition, the actual control links are encrypted with NSA approved, Type 1 cryptography, and commands are authenticated. During platform development, there is a significant system secu-

rity engineering effort between NSA and NRO to make sure that all avenues of attack, including cyber-attack, are addressed and countermeasures developed.

A cyber-attack on our military's information technology, though, would affect the ability to process, analyze, and report information collected from these assets. We have a number of efforts underway to develop protection, as well as detection, technology to help us address these concerns. Our Information Assurance and Information Operations programs are addressing just these issues. The Department is modernizing the strongest encryption technology to keep pace with the rapid changes in information technology. Network sensor development and deployment is helping us identify attacks before they cause us damage. Pervasive use of our defense-in-depth strategy, constructing defenses and safeguards in successive layers, is improving our protection from cyber-attack.

Overall funding in the fiscal year 2003 President's budget for Computer Network Defense programs has increased more than 50 percent compared to fiscal year 2001. Cyber-attack prevention is one of the Department's highest priorities, which presents a formidable challenge. We will continue to work at meeting these challenges head-on.

BANDWIDTH CAPABILITIES

2. Senator BEN NELSON. Secretary Stenbit, we need equipment that allows us to locate and maintain surveillance of the enemy while preserving American lives. It appears that a limiting factor in ISR equipment is bandwidth, as it was in Kosovo in 1999. We have the technology for the sensors, the surveillance platforms, and the munitions but the real problem is bandwidth, which has been hindered by a slowing satellite industry. What are we doing to increase our bandwidth capabilities and does this budget support increasing those capabilities?

Secretary STENBIT. The 2003 budget contains significant investments in laser-based communications, both on the ground and in space, to create a ubiquitous, trustworthy, dependable network where bandwidth is not a constraint for users. The Global Information Grid (GIG) Bandwidth Expansion program will provide some key DOD sites with very wideband terrestrial-based capability starting in fiscal year 2003. When completed in fiscal year 2004, this initiative will provide assured, high bandwidth terrestrial network access to DOD's highest priority locations. The transformational communications satellites will provide the space-based part of this optical network. These investments, along with investments in Wideband Gap-filler and Extended Tether Program will ensure that bandwidth is not a limiting factor in ISR collection, processing, or dissemination capabilities in the future.

RIVET JOINT

3. Senator BEN NELSON. General Newbold, precision engagement technology and ISR assets rely heavily on the RC–135 (Rivet Joint) as well as other platforms. We await delivery of Rivet Joint numbers 17 and 18 as well as their trainers. Does this budget support the high demand for this air frame?

General NEWBOLD. Yes. The fiscal year 2003 President's budget request, the fiscal year 2001 Emergency Supplemental Appropriations Act for Recovery From and Response to Terrorist Attacks on the U.S., and fiscal year 2002 Defense Budget provide significant investments in the RC–135 fleet. When taken together, these investments will yield long-term operational benefits and solve systemic training deficiencies.

Consistent with the findings of the 2000 Joint Airborne Reconnaissance Assessment (JARA) and a subsequent Air Force report, the Department requested funding for two additional Rivet Joints in the first Combating Terrorism Supplemental. Congress agreed to the acquisition of one additional RC–135. Rivet Joint number 17 has been funded and is under construction. In addition to this welcome fleet increase, additional training resources were also fully funded. These training resources include one additional TC–135 training aircraft and a new full-motion simulator for flight crew training.

The resulting fleet of Rivet Joint aircraft will be 17 RC–135 mission aircraft and 3 training aircraft. The RC–135 program to re-engine aircraft should provide additional capacity. In the meantime, we will carefully manage the distribution of RC–135 aircraft to meet CINC demands.

[Whereupon, at 3:30 p.m, the subcommittee adjourned.]