HEARING TO RECEIVE TESTIMONY ON SUSTAINING NUCLEAR WEAPONS UNDER THE NEW START

THURSDAY, JULY 15, 2010

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

The committee met, pursuant to notice, at 9:38 a.m. in room SD–106, Dirksen Senate Office Building, Senator Carl Levin (chairman) presiding.

Committee members present: Senators Levin, Lieberman, Reed, E. Benjamin Nelson, Udall, Hagan, Burris, Bingaman, McCain, Inhofe, Sessions, Chambliss, Thune, Brown, and Collins.

Committee staff members present: Richard D. DeBobes, staff director; and Leah C. Brewer, nominations and hearings clerk.

Majority staff members present: Madelyn R. Creedon, counsel; and Peter K. Levine, general counsel.

Minority staff members present: Joseph W. Bowab, Republican staff director; and Daniel A. Lerner, professional staff member.

Staff assistants present: Paul J. Hubbard, Jennifer R. Knowles, and Hannah I. Lloyd.

Committee members' assistants present: Christopher Griffin, assistant to Senator Lieberman; Nick Ikeda, assistant to Senator Akaka; Ann Premer, assistant to Senator Ben Nelson; Jennifer Barrett, assistant to Senator Udall; Roger Pena, assistant to Senator Hagan; Nathan Davern, assistant to Senator Burris; and Jonathan Epstein, assistant to Senator Bingaman; Anthony Lazarski, assistant to Senator Inhofe; Lenwood Landrum and Sandra Luff, assistants to Senator Sessions; Clyde A. Taylor IV, assistant to Senator Chambliss; Jason Van Beek, assistant to Senator Thune; Scott Clendaniel, assistant to Senator Brown; Brooks Tucker, assistant to Senator Burr; and Ryan Kaldahl, assistant to Senator Collins.

OPENING STATEMENT OF SENATOR CARL LEVIN, CHAIRMAN

Chairman LEVIN. Good morning, everybody, and a very warm welcome to our witnesses. This morning we are going to explore the impact of the New START Treaty on the Nuclear Weapons Life Extension Program and the ability to maintain a safe, secure, and reliable, albeit smaller, stockpile of nuclear weapons.

We have with us this morning four distinguished witnesses: Dr. Roy Schwitters, the S.W. Richardson Professor of Physics at the University of Texas-Austin, and the Chairman of the JASON Life

Extension Study Panel; Dr. Michael Anastasio, the Director of the Los Alamos National Laboratory; Dr. George Miller, the Director of the Lawrence Livermore National Laboratory; and Dr. Paul Hommert, the Director of the Sandia National Laboratory.

JASON is an independent group of renowned technical experts who perform studies for the Department of Defense, the National Nuclear Security Administration, and the intelligence community. The three national labs support the National Nuclear Security Administration in maintaining the nuclear stockpile and working to prevent the proliferation of nuclear weapons and technology. The labs also conduct a broad range of research and development activities for the Departments of Defense and Energy, as well as for a variety of other Federal Government agencies.

The national laboratories are responsible for providing technical management of the nuclear weapons stockpile. In order to ensure that the stockpile remains safe, secure, and reliable in the future, the laboratories must fully understand the status of the thousands of parts and components in nuclear weapons and recommend how these parts and components should be maintained.

The Life Extension Program was established to maintain the nuclear stockpile. Under the Life Extension Program, there are three options to deal with maintaining the weapons. Nuclear components can be replaced with rebuilt parts similar to those being replaced; this is called refurbishment. Nuclear components can be replaced with parts from other weapons; this is called re-use. Or nuclear components can be replaced with newly designed nuclear components, and this is called replacement.

We will talk more today about these three R's: refurbishment, reuse, or replacement. Today we'll also explore how the labs go about understanding the status and reliability of the nuclear weapons and making technical recommendations to sustain them.

Beginning in the early 1990s, the Department of Energy has made significant investments in experimental tools and facilities and led the world in developing computational capability in order to sustain nuclear weapons without underground nuclear testing. This 18-year experience has provided the laboratories with the technical knowledge to be able to have confidence with the right support from the administration and the Congress to maintain the nuclear stockpile in a safe, secure, and reliable status for the foreseeable future.

Under the New START Treaty, the number of deployed nuclear weapons will be reduced, which will also result in a smaller overall stockpile. The ability to confidently maintain a smaller stockpile is an important underpinning of the New START. With the increased funding in the fiscal year 2011 budget request and long-term support for the labs, maintaining the stockpile should be achievable.

I look forward to discussing with our witnesses the challenges associated with maintaining a nuclear stockpile that is safe, secure, and reliable and what is needed, in their judgment, to ensure the Nuclear Weapons Life Extension Program is a success.

Now, we're going to begin this hearing in open session and then we will move to a closed session in Room 217 of the Senate Visitors Center. I understand there's a vote at 11:00 o'clock, so it's perhaps

possible that we can complete the open session by 11:00 or shortly thereafter. If not, we will come back here to complete it.

Senator McCain.

STATEMENT OF SENATOR JOHN MCCAIN

Senator MCCAIN. Thank you, Mr. Chairman, and I thank our distinguished witnesses for joining us today and the outstanding work that they do.

The purpose of this hearing, as the chairman mentioned, is to discuss the New START Treaty and evaluate the current and long-term ability of the National nuclear security laboratories to sustain the nuclear weapons stockpile. Given the many years of neglect, the weapons complex is in dire need of investment in both its intellectual and physical infrastructure. This investment is critical and long overdue, and without it further reductions to the stockpile could significantly undermine the effectiveness of our strategic deterrent.

Our strategic posture, how we design, manufacture, field, and evaluate the nuclear arsenal, becomes increasingly important as we reduce the size of our stockpile. If ratification of the New START Treaty is to serve rather than undermine our National security, we need adequate resources and a consistent long-term commitment to modernize the weapons complex, address its crumbling infrastructure, and stem its impending brain drain.

At the request of Congress, the administration provided an $80 billion, 10-year plan for modernizing the nuclear weapons complex. However, the plan raises questions as to its adequacy for meeting our full recapitalization and missile modernization needs. Of the administration's commitment to provide $80 billion over the next 10 years, more than $70 billion of it represents funding needed simply to sustain the nuclear weapons complex at today's capability.

Assuming that out-year budgets will continue to support full funding of the 10-year modernization plan, about $1 billion per year is allocated for modernization needs, hardly what many would consider a meaningful or robust reinvestment. I understand that prior to the release of the fiscal year 2011 budget the National lab directors reportedly requested a significantly greater investment than what the administration ultimately proposed.

I look forward to hearing from our witnesses why they felt more was needed, if they perceive potential funding shortfalls, and how they believe the forthcoming budget request will address, among other issues, our critical physical and intellectual infrastructure needs.

During this committee's hearing on the Nuclear Posture Review concerns were raised about the administration's decision to discourage life extension programs involving the replacement of warheads. Counter to the recommendations of the bipartisan Perry-Schlesinger Strategic Posture Commission, the NPR seems to undermine a pragmatic approach to the life extension of our weapons, while threatening our ability to recruit the best and brightest next generation of talent.

All modernization options that are achievable without testing or the establishment of a new military characteristic—including re-

placement, which in some cases may be the best option, should be encouraged and pursued. As General Kevin Chilton, commander of U.S. Strategic Command, told the House Armed Services Committee in March: "We should not constrain our engineers and scientists in developing options on what it will take to achieve the objectives of the stockpile management program, and let them bring forward their best recommendations for both the President and the Congress to assess as to what is the best way forward."

I'd be very interested to hear from our lab directors whether a policy that encourages refurbishment and re-use over replacement could be detrimental to our ability to provide the safest, most secure, and most reliable deterrent.

I've been a supporter of previous bipartisan efforts to reduce our nuclear weapons in step with the Russian government. Many of us have concerns about the New START Treaty's methods of verification, its constraints on ballistic missile defense, and the accompanying plan for modernization of our nuclear stockpile. It's my hope that over the course of our hearings and through further dialogue and negotiation with the administration Congress will receive both the assurances and the funding commitment to address these concerns.

Thank you, Mr. Chairman.

[The prepared statement of Senator McCain follows:]

[COMMITTEE INERT]

Chairman LEVIN. Thank you very much, Senator McCain.

Dr. Schwitters, we're going to begin with you.

STATEMENT OF ROY F. SCHWITTERS, PH.D., CHAIRMAN, JASON DEFENSE ADVISORY GROUP, AND S.W. RICHARDSON FOUNDATION REGENTAL PROFESSOR OF PHYSICS, UNIVERSITY OF TEXAS AT AUSTIN

Dr. SCHWITTERS. Thank you, Mr. Chairman, Senator McCain. I very much appreciate this opportunity to report to you on the 2009 JASON review of the LEP program. I've prepared remarks, which I've presented to the committee. I'll try to summarize those briefly here.

The impetus for our study was a request from the House Subcommittee on Strategic Forces to the NNSA Administrator for a technical review of LEP strategies for maintaining the nuclear deterrent analogous to the 2007 study on RRW which we performed for NNSA.

Chairman LEVIN. Could you tell us what—I think we know what your acronyms mean, but—

Dr. SCHWITTERS. Yes, sir.

Chairman LEVIN.—"LEP" is the Life Extension Program.

Dr. SCHWITTERS. "LEP" is the Life Extension Program, and your introductory remarks are a very good summary of the detailed work that goes into that program.

Chairman LEVIN. And that last acronym that you used?

Dr. SCHWITTERS. The last acronym is "RRW" and that indicated Reliable Replacement Warhead, which was another important that was considered for securing the stockpile.

Chairman LEVIN. Thank you.

Dr. SCHWITTERS. In brief, our study found—and let me quote—oh, let me back up. With respect to RRW, a concern has always been, of course, the maintenance of an aging stockpile, no question about that. That's where we come in and work with the labs to understand the technical details of this.

So an important question that was brought to us immediately in last year's study of Life Extension Programs was the question of the build-up of aging effects and how they affect the security, reliability, and so on of the stockpile. So that was our first finding in the study, that no evidence that accumulation of changes incurred from aging and life extension activities have increased risk to certification of today's deployed nuclear warheads. And we can go into detail on the meaning of that.

The second recommendation, or the second finding, excuse me, is that the lifetimes of today's nuclear warheads could be extended for decades with no anticipated loss in confidence by using approaches similar to those employed in LEPs to date. Now, this is an important point and I want to explain the basis for that. The reason that we find confidence in the ability to extend the lifetimes of the current stockpile is based on the tremendous investment that the country has made in science-based stockpile stewardship since the end of the Cold War.

So when we say methods similar to what's been done in the past, we're talking about the science, the new tools, the new computing capabilities, the experimental facilities, and the detailed work by the folks in the laboratory that have given us the present confidence we have. So this is an important investment, and I think the message, if you will, the lesson that we've seen in the LEP, life extensions, to date is the fact that the system, the full power of these people and tools, have learned a lot about the current stockpile that we didn't know before entirely and are able to apply it in excellent ways to provide the stockpile that we need.

Our study followed on a series of studies for the past several years on technical aspects of the nuclear weapons program. I want to just point out that we, of course, rely on the laboratories for the information. We probe their people, look at the experiments, try to consider the results from a technical point of view.

I want to acknowledge, first of all, that our group finds the work to be excellent in quality and we have had total cooperation as we explore these details. Their folks come down to our briefing sessions and get quite a onslaught of questions, and we just assure them that we treat ourselves just as tough as we treated them in this process. So it's a really, for me personally, an exciting and important give and take of the highest scientific caliber.

Now, you mentioned, Mr. Chairman, in your opening remarks the three R's. We looked in detail at, again, the technical differences and whether special issues come up depending on whether you're refurbishing a system, replacing systems, or re-using systems in different ways in the stockpile. I think the lesson we found is that, while this terminology is useful, that in fact the history of life extension programs to date is such that good, sensible applications of all three R's go into the life extension programs that have already successfully been completed.

I think the most—so for example, the ongoing life extension program on a system called the W76 is mainly of the refurbishment type. It includes in my view and the view of our group very sensible cases where other components have been rebuilt and replaced with new technologies. So we've seen the ability of this enterprise to understand issues that come up in an aging stockpile and to manage surprises in the system that you inevitably find in complex technical systems like these has been excellent, and it doesn't really strictly map onto the three R's.

The key in our view for the technical validation of these ideas, however, is strongly dependent on the process, which is going on, of reviewing any proposed changes, be they refurbishment, the reuse, or the replacement, from a very strict set of technical understandings related back to the original nuclear underground test database, to—and this is so important—to our better and new understanding of how these systems work, and finally to a host of non- nuclear experiments which can be carried out to greater or lesser degrees depending on the particular systems here.

So we in our study, rather than sticking with the sort of generalities of the three R's, we went in detail case by case of the systems that have been examined and those soon to go into life extension program to reach our conclusions.

Let me emphasize one, if you will, technical point in this that I'd like to make, and then I'll tell you a little bit about our recommendations. In making stockpile assessments, it's always important to compare the estimated value of a performance margin. Now, in a system as complicated as a nuclear weapon there are several margins that matter a lot. However, it's important that just by itself the margin is not all that you need to know. This again is the great advent of the science-based stockpile stewardship, is that we now have understanding of the uncertainties in the estimation of those performance margins. That's new. That is good news, and at least now as the program goes forward and certainly as JASON examines these systems and their changes, we emphasize comparing margin always to uncertainty.

So what that means, as you bring on a new system—you need to make a technical change for reasons of policy or military requirements, whatever—it's always important to compare therefore the tie-back to the underground test database and then these margins in association with the corresponding uncertainty.

It is possible that you might start to design a new system, you might go down a path quite a ways toward implementation, but if the uncertainty scales faster, so to speak, rises with your proposed change out of proportion to the margin that you gain, one has to reevaluate that. So that's a very important detail as you get into the nitty- gritty on these systems.

Let me just close with a brief comment on our first two recommendations, and those are the following. First is, determine the full potential of refurbishment, as exemplified by the life extension programs executed to date. Now, that we believe is largely because of the investment and the knowledge we have of those systems.

The second and related recommendation is to quantify the potential benefits and challenges to life extension strategies that may require re-use and replacement to prepare for the possibility of future

requirements, as for example reduced yield or enhanced surety systems. These we believe—this strategy we believe is, first of all, not a refurbishment-only strategy. This is a prudent strategy where we try to leverage the knowledge gained in these complex systems against the changing needs of the stockpile. That was the basis for that recommendation.

I think with that I should stop and I'd be more than pleased to answer your questions. Thank you.

[The prepared statement of Dr. Schwitters follows:]

Chairman LEVIN. Thank you very much, Dr. Schwitters. The Nation owes you and your colleagues at JASON a great debt of gratitude. You are really independent and distinguished and recognized for both of those characteristics. We're grateful to you all.

Dr. SCHWITTERS. Thank you very much.

Chairman LEVIN. Let's start—let's continue now with Dr. Anastasio.

STATEMENT OF MICHAEL R. ANASTASIO, PH.D., DIRECTOR, LOS ALAMOS NATIONAL LABORATORY

Dr. ANASTASIO. Thank you, Chairman Levin and Ranking Member McCain and other members of the committee. I appreciate the opportunity to appear before you today. I'm Dr. Michael Anastasio. I'm the Director of the Los Alamos National Laboratory, and it's a real honor to be here.

I've devoted the bulk of my career to the nuclear weapons enterprise, since 2006 as Director here at Los Alamos, but originally as a weapons designer at the Lawrence Livermore National Laboratory, before becoming Director there in 2002.

In the President's April 2009 Prague speech and the recently released Nuclear Posture Review, the administration has directly linked reductions in nuclear weapons to the maintenance of the nuclear arsenal, both supporting its overall goal to reduce the global nuclear danger.

Secretary of Energy Steven Chu testified recently that as the stockpile decreases in size the role of science, technology, and engineering in deterrence will increase in importance. The reductions proposed in New START highlight the importance of the laboratories' mission and the need for a healthy and vibrant science, technology, and engineering base.

So there's three points I'd like to emphasize for you today, and you do have my written testimony that goes into more detail. First, the stockpile stewardship program created by Congress in the mid-1990s has had many successes that were by no means assured when we started that program. We've maintained a safe, secure, and effective stockpile for the Nation without resorting to nuclear testing. So far, we have retained the knowledge and critical skills of an outstanding scientific and engineering workforce. We've built many of the tools required for this task in the form of the world's fastest supercomputers and new experimental capabilities such as the DARHT, the NIF, and the MESA at our three laboratories.

But we're not finished. Because of the science we have developed, and as Dr. Schwitters pointed out, we now know more about the nuclear weapons systems than we ever have. In particular, we've learned that our systems are aging and almost every one will re-

quire some form of life extension activity in the next 25 years. The available mitigation actions are reaching their limits and we have not challenged the full skill set of our workforce. Therefore I think it's important that we go beyond the refurbishments that have been considered to date as we look to the future.

The second point I'd like to make is that the Obama Administration has put in place a new nuclear policy in its NPR and brought forward an fiscal year 2011 budget proposal that calls for significant increase in weapons activity spending. The NPR calls for a case by case analysis of the full range of life extension approaches, refurbishment, re- use, and replacement. It also expresses a strong preference for refurbishment or re-use in a decision to proceed to engineering development.

I understand the sensitivity of this issue and we heard this in some of the opening comments. But I do not feel overly constrained by the language in the NPR. Rather, I believe that it provides the necessary flexibility to manage the stockpile with acceptable levels of risk. It is always my obligation to ensure that the best technical recommendations to meet requirements are brought forward for your considerations, regardless of the statements in the NPR.

The fiscal year 2011 budget request, which calls for a $624 million increase, is essential. This is a positive step and a show of commitment that helps stabilize the weapons program. It also puts necessary new funds towards starting some of the needed hands-on work for the stockpile and repairing the decaying infrastructure of the complex.

My third and final point is that, even with these positive actions, I am concerned. This effort will require sustained focus by multiple administrations and multiple Congresses for several decades. I fear that program expectations may already be out of line with the fiscal realities faced by the country.

The nuclear infrastructure needs and the stockpile needs have the potential to unbalance the rest of the program, squeezing out the science that is the basis for stockpile stewardship. In addition, we must balance the need to hire the future national security workforce with looming pension shortfalls of nearly $200 million in fiscal year 2012 at Los Alamos.

So in conclusion, I'm cautiously optimistic about the future of the nuclear weapons program, that we can carry out our responsibilities under New START with adequate levels of risk. But we need help, and I urge Congress to work with the administration to form a national consensus on nuclear policy and to support the fiscal year 2011 budget request as a necessary first step forward. I would welcome a dialogue on how to best sustain focus on these issues well into the future.

Thank you, and of course I'd be happy to answer any questions.

[The prepared statement of Dr. Anastasio follows:]

Chairman LEVIN. Thank you very much, Dr. Anastasio.

Dr. MILLER.

STATEMENT OF GEORGE H. MILLER, Ph.D., DIRECTOR, LAWRENCE LIVERMORE NATIONAL LABORATORY

Dr. MILLER. Thank you, Chairman Levin and Ranking Member McCain and distinguished members of the committee, for your con-

tinuing support of the Nation's stockpile stewardship program. Like Dr. Anastasio, I have devoted much of my career to the nuclear weapons program. Several of the weapons that are currently in the U.S. arsenal I designed personally. So this is an issue about which I care deeply.

There are three points that I'd like to emphasize today. Technically, we have an approach that can maintain the safety, security, and effectiveness of our arsenal without nuclear testing and without introducing new military capabilities. To meet those mission requirements and carry out the program of work will require sustaining the nuclear security enterprise for decades with a balanced investment in the stockpile itself, in refurbishing and maintaining the critical physical infrastructure, and in supporting the underpinning science, technology, and engineering. Above all, we together must nurture and sustain the outstanding stewards at our laboratories and production facilities.

From a scientific and technical point of view, I have confidence that we can maintain a safe, secure, and effective deterrent through the stockpile stewardship program because of the successes that we have had to date and our ability to build on them. We have greatly improved our simulation and experimental capabilities. These are unique national assets that allow us to understand details about the performance of weapons that were undiscovered in the era of nuclear testing.

We have found and corrected issues in the stockpile and are continuously improving our abilities to assess weapons performance and certify the changes that are necessary in order to extend the life of the stockpile. We have successfully extended the life of some of the systems in the stockpile and we are providing hands-on experience to train the next generation of stockpile stewards.

The President's 2011 budget request seeks increased funding to reverse the recent declining budget trends and create a sustainable stockpile enterprise. The Nation's deterrent requires this stockpile stewardship and management program, that it is adequately funded by successive administrations and Congress to provide the funding to meet the mission requirements.

Today as we sit here, additional investments are needed in all three areas of the stockpile stewardship and management program: in the science and technology that underpins our understanding, in the life extension programs that are necessary to keep the systems themselves alive, and in the modernization of the facilities and infrastructure. I urge Congress to work with the administration to support this vital first step.

The science and technology underpins our confidence in the stockpile and is of vital importance to understand the nature of the stockpile itself. We call this surveillance. We need in my opinion to step up the rate of surveillance and become more proficient at detecting issues early through the technologies that we have developed. We need to take full advantage of the two-laboratory system to provide assessments of the stockpile as it moves forward and ages. Much like something else that we're very familiar with, when we have serious illnesses we frequently ask for the opinions of more than one doctor.

We need to continue to pursue remarkable advances in our assessment tools and in using the experimental facilities and continuing to advance the simulation capability beyond what we currently have. We need to undertake life extension programs over the next 2 decades to extend the life of the systems that are currently in the stockpile.

These options will be based on previously tested nuclear designs and it's very important that we have the ability to consider all of the technical options, from refurbishment to component re-use to replacement, while carefully considering through this process the possibilities of improving the safety, the security, the manufacturability, the maintainability of the stockpile, and carefully considering issues of cost and risk and our ability to meet the overall goals of the country.

These life extension programs also offer the opportunity to provide important resiliency to the stockpile as the size is reduced by having warheads that are easily adaptable from one security to another.

Finally, we need to modernize our facilities. We need to replace the Cold War era facilities, particularly for processing uranium and plutonium, and upgrade the physical infrastructure of the complex. This will require major increases in funding while sustaining the balance with the other parts of the program.

Above all, we need to nurture and sustain the outstanding stewards at our laboratories and production facilities and help effectively mentor them so that we can create our future. Long-term success is ultimately dependent upon the quality of this work force. That work force needs a program that is stable, that's technically engaging, and is of recognized importance to the Nation.

While the President's budget for 2011 is a good start, the 10-year plan calls for continued significant budget increases. These are needed in order to carry out the program of work that I outlined before. It is a major undertaking and one that requires our collective sustained attention and focus.

Again, thank you very much for your continued support for this important program and for your continued interest in discussing these important issues. Thank you.

[The prepared statement of Dr. Miller follows:]

Chairman LEVIN. Thank you, Dr. Miller.

Dr. Hommert.

STATEMENT OF PAUL J. HOMMERT, Ph.D., DIRECTOR, SANDIA NATIONAL LABORATORIES

Dr. HOMMERT. Chairman Levin, Ranking Member McCain, and distinguished members of the committee: Thank you for the opportunity to testify. I am Paul Hommert, Director of Sandia National Laboratories, a multi-program national security lab. I'm honored to be here with my colleagues from Los Alamos, Lawrence Livermore, and Dr. Schwitters to testify on sustaining nuclear weapons under the New START.

Within the policy outlined in the NPR, the collective DOD and NNSA guidance documents, the fiscal year 2011 budget request, and the force structure terms of the New START, I am confident that Sandia can provide the required support for the Nation's nu-

clear deterrent. This confidence comes from our assessment of stockpile management requirements against our mission, product space, and capabilities.

Within the nuclear weapons complex, Sandia is responsible for the design and qualification of non-nuclear components that ensure the weapons perform as intended, when authorized, and remain safe and secure otherwise. We are responsible for hundreds of highly specialized components with extremely high reliability requirements and unique, often very harsh environmental requirements.

Today we are facing new challenges. The weapons in the stockpile are aging and were designed when long life was not a high priority. The radar for the first B61 bomb, for example, was designed for a 5-year lifetime. There are B61s in the stockpile today with components that date back to the 1960s. It is a credit to the stewardship program that we have the technical knowledge to support continued confidence in these weapons systems as they age.

What are the keys to managing the stockpile into the future? First, a strong and modernized surveillance program tailored to the needs of an aging, smaller stockpile, to underpin our annual assessment findings and recommendations. While this is essential for the future, it is not sufficient. Through surveillance activities to date, we have already established a number of stockpile concerns that must be addressed.

Thus, the second element is the life extension programs, foremost for us being the B61. This is an immediate challenge for Sandia, with a demanding schedule and a technical scope more than twice that of the W76 life extension program. I support the full scope approach called for by the NPR and would be very concerned if we only replaced the non-nuclear components with the most immediate aging issues and chose to re-use other non- nuclear components, some of which are even now over 40 years old.

In addition to the surveillance programs and the life extension efforts, we must give strong attention to sustaining capabilities for the future. The highest priority is the viability of our design competencies. In recent years, uncertainty surrounding requirements for the stockpile resulted in the programmatic instability noted by the JASON panel as a threat to the stewardship program. Today nearly half of the Sandia staff with experience in major weapons system efforts are over the age of 55. Their remaining careers will not span the upcoming life extension programs. This puts a premium going forward on stable, multi-year program direction and resources to provide opportunities for new technical staff to work with experienced designers.

Also key to sustainment is keeping pace with modern day technologies. As an example, consider microelectronics, where since we began our most recent full system development effort, the W88, in 1983, there has been a quantum leap in miniaturization and microelectronics functionality that offer real potential for enhancements to stockpile safety and security which we will realize in the B61 LEP.

Infrastructure sustainment is also critical. We have world-class facilities where we perform a range of scientific research and product qualification. But we also have outdated facilities that were commissioned in the 1950s and 1960s. We are working with NNSA

to complete revitalization of our environmental test capabilities required to support the design of the B61 and subsequent LEPs, and to recapitalize the tooling in our trusted microelectronics facility.

At Sandia our broad national security work is critical to sustainment. We are well poised to support the New START regime and to continue our contributions to the National security, nuclear security, nonproliferation, and counterterrorism objectives of the Nation. This work exercises and strengthens many of our nuclear weapons capabilities.

New START would not constrain the upcoming life extension imperatives. However, it does reinforce the importance of a modern stockpile, a responsive infrastructure, as we move towards a smaller nuclear arsenal.

Let me close by summarizing the keys to success going forward: a robust surveillance program, stable life extension programs, an unyielding attention to sustaining the key aspects of our capabilities for the future: people, technologies, infrastructure, and our broader national security programs.

Thank you and I welcome your questions.

[The prepared statement of Dr. Hommert follows:]

Chairman LEVIN. Thank you very much, Dr. Hommert. We thank all of our lab directors and their staffs for the great work that you do.

Let's see if we could finish—I'm not sure we can—by 11:00, but let's try, and we'll try with a first round of 6 minutes towards that goal. If we don't finish, we'll just come back after the vote.

The Nuclear Posture Review states a preference for refurbishment or re-use as I understand it. Is that correct?

Dr. ANASTASIO. Yes, sir.

Chairman LEVIN. Of the three R's.

Now, does that preference constrain the labs in any way in your review of life extension options? Dr. Anastasio?

Dr. ANASTASIO. Sir, I don't believe that overly constrains us, Senator. We still have the directive to look at the full range of options as we consider the requirements and the best technical path forward. As I said in my opening comments, I feel it's my obligation, not just the request but my obligation, to bring forward the best technical ideas in every case. So it's not a perfect solution, but I think it's one that gives us the flexibility we need, that we can have adequate levels of confidence in, to stimulate the work force to do the creative and innovative things they always do to support such a national important issue.

Chairman LEVIN. Dr. Miller, do you basically agree with that?

Dr. MILLER. Yes, sir, I agree with Dr. Anastasio's statement.

Chairman LEVIN. Dr. Hommert, would you agree with that?

Dr. HOMMERT. Yes, I agree. I want to point out that for our components, the non-nuclear components, we are typically in a replacement mode by the very nature of it, and re-use where appropriate and refurbishment as well.

Chairman LEVIN. It's been alleged by some that the Nuclear Posture Review is going to stifle creative and imaginative thinking. Do you agree with that, Dr. Anastasio?

Dr. ANASTASIO. No, sir. I think that by looking at the full spectrum of options on a case by case basis, that's just the opportunity we need to stimulate the creativity of our work force.

Chairman LEVIN. Dr. Miller?

Dr. MILLER. Yes, very much. As Mike said, I really do believe very strongly that it is my responsibility to make sure that the work force at the laboratory considers the full range of options. They will naturally want to do that on their own.

Chairman LEVIN. And that you feel that that is what you have the authority to do?

Dr. MILLER. Yes, sir. I believe we have not only the—we certainly have the authority, but I believe we also have the direction to do that.

Chairman LEVIN. Dr. Hommert?

Dr. HOMMERT. Yes, I agree.

Chairman LEVIN. Dr. Schwitters, the JASON Life Extension Study Panel found that the lifetime of today's nuclear weapons could be extended for decades with no anticipated loss in confidence by using approaches similar to those employed in life extensions to date, and that's a critically important conclusion that appears to confirm that the current weapons in the stockpile will be able to continue to meet military requirements and maintain safe, secure, and reliable using one of the three R approaches that you've all mentioned now.

Did the JASON study find that the replacement option would introduce the most significant degree of change in the stockpile?

Dr. SCHWITTERS. I'd like to take a narrower answer on that.

Chairman LEVIN. Sure.

Dr. SCHWITTERS. Again, some of the systems are being replaced, and successfully, and they stand the scrutiny that the labs give them and that we've seen in coming back. So I would like to say I think it's very important that the labs explore these replacement strategies and they may be needed in some future requirements. But I think it's our feeling that basing further work on the knowledge base that exists through the other two strategies is the path of least risk at this point.

Chairman LEVIN. Thank you.

Now, our lab directors have all mentioned shortfalls in previous years' budgets. As I understand it, there were significant layoffs in the fiscal year 2008, fiscal year 2008 budget year, that the budgets in fiscal year 2009 and fiscal year 2010 provided some small financial improvement, although I understand that some layoffs continued in fiscal year 2009.

Now, my question has to do with the—first of all, you can comment on that when answering the question. The budget in fiscal year 2011 as I understand it and your testimony will allow you to begin to recover from the shortfalls in previous years budgets; is that correct, Dr. Anastasio?

Dr. ANASTASIO. Mr. Chairman, since 2006 at Los Alamos we've reduced the work force by over 2200 people. That's a significant fraction of the work force. And yes, with the proposed 2011 budget by the administration that will in fact stabilize the work force and I think put us back on a track that starts to improve the situation that we've been seeing in recent years.

Chairman LEVIN. Dr. Miller?

Dr. MILLER. Yes, sir. At Livermore we have reduced the work force since 2007 by about 2000 people. About a third of those were highly trained scientists and engineers, so that that has been a significant concern. The 2011 budget starts us back in the right direction. It allows us to grow a little bit from inflation, puts us back on the right course. It does not include all of the things that we will need over the long term, but it is an extraordinarily good first step.

Chairman LEVIN. Thank you.

Dr. Hommert?

Dr. HOMMERT. Yes, since the period from '06 through '08 at Sandia we've reduced by about 800 the staff associated with the core nuclear weapons activities at the laboratories. The majority of those staff moved to other national security imperatives that we are working on.

When I look at the fiscal year 2011 budget, for us the change is dominated by the commitment we have to execute the B61 LEP, which needs to begin immediately, and that budget is adequate for us to begin that effort.

Chairman LEVIN. Thank you very much.

Senator McCain.

Senator MCCAIN. Thank you, Mr. Chairman.

A letter, which I'd like to submit for the record, dated May 19, 2010, to Secretaries Gates and Chu from ten former and well-respected lab directors, cited significant concern with the guidance set forth in the administration's Nuclear Posture Review to give strong preference to options for refurbishment or re-use. The former directors state that such guidance imposes unnecessary constraints on our engineers and scientists and that, based on their experience as former lab directors, they believe that this higher bar for certain life extension options will stifle the creative and imaginative thinking that typifies the excellent history of progress and development at the National laboratories, and indeed will inhibit the NPR's goal of honing the specialized skills needed to sustain the nuclear deterrent.

I take it from the witnesses' statements today you disagree. Are these ten former lab directors misinformed, wrong, or why does there seem to be some difference of opinion here? Beginning with you, Dr. Anastasio?

[The information referred to follows:]

Dr. ANASTASIO. Thank you, Senator. It's certainly true that there are restrictions in the NPR on how to proceed forward with engineering development. But I still believe that it's very clear that we have both the authority and the responsibility to explore on a case by case basis what's the best approach, technical approach, for each weapons system to extend its life well into the future, to include the full range of options that will spark and stimulate the innovation and creativity of our work force.

Recall, where we've been is that we have not pursued even reuse as a strategy in recent years. So I think opening these options up will be very important to the work force for us to be able to train and transfer knowledge to a newly, highly capable work force that we will need for the future.

Senator MCCAIN. I understand all that and I appreciate it. But the ten directors are misinformed or you just have a simple disagreement?

Dr. ANASTASIO. I think it's a matter of—what's the word I'm looking for? It's a matter of emphasis, that certainly having no restrictions would be the more perfect solution, but I believe with the way the NPR is written that we have an adequate level of technical flexibility to carry out our mission.

Senator MCCAIN. Dr. Miller.

Dr. MILLER. Yes, sir. Thank you, Senator. I believe that the concern expressed by the former lab directors is obviously a legitimate concern. It's a concern that I have. However, as I agreed with Mike, I believe that the situation we have is a workable one. As I said, it is my responsibility to make sure that the full range of options and creativity are exercised by our work force, by our designers, in bringing forth for consideration by the Congress and the administration for all of the potential options for improving the stockpile and the future. So I believe it's a workable situation.

Senator MCCAIN. So you agree, but you think it's workable? Is that sort of your answer?

Dr. MILLER. Again, as I said, it is a concern. It's something I pay a lot of attention to. I believe we can work with the situation as it's currently described.

Dr. ANASTASIO. And I would agree with that.

Senator MCCAIN. Thank you.

Dr. Hommert.

Dr. HOMMERT. I think this issue sits largely in the space of my colleagues because it mostly focuses on the nuclear componentry. From our standpoint, the most dominant issue is that when we look at the next decade and the B61 LEP, the 78 LEP, that we commit to a full-scope effort on those, first in largely a refurbishment space, using the language applying to the nuclear package, and in the re-use space on the 78, and that we commit to full-scope replacement of non-nuclear.

Senator MCCAIN. I understand your position. Now I'd like the answer to the question.

Dr. HOMMERT. I believe that, from my perspective, there is sufficient intellectual challenge and opportunity for innovation that our staff can—in the context of work over the next decade, that affords the strength of our deterrent and the intellectual capability of the staff; that language—

Senator MCCAIN. Thank you.

Dr. HOMMERT.—is not restrictive in that regard.

Senator MCCAIN. Thank you.

Dr. Schwitters.

Dr. SCHWITTERS. Sir, I disagree with the statement in the directors', former directors', letter. I think it fails to properly account for the knowledge that's been a result of ongoing stockpile stewardship and into the future. I also—in working with the labs and knowing the people as we know them at the labs, there are tough technical scientific challenges that are well within the scope of the NPR, that need to be done, and I think,under this question of stability in the work force that came up before, offers opportunities for people to

really grow professionally and to explore the full range of physically sensible solutions.

So I don't agree with them, and I've spoken with some of the directors on that list about it.

Senator MCCAIN. Well, thank you, Dr. Schwitters. I wasn't asking about knowledge or challenges. I was asking about whether this policy would constrain our ability to replace as well as to refurbish.

But you've also addressed my next question, which my time has expired, and that is that—it's a very delicate question as to whether you are pleased at the increased commitment of funding or whether—and whether that is sufficient in order to get the job done to comply with our Nation's national security needs?

I am pleased with the commitment to increased funding, as I know you are. But there is I think a large question that looms out there, Mr. Chairman, of whether that is just a welcome increase, which we all welcome, but whether it is also sufficient to meet the needs, the increased needs we have in compliance with the New START Treaty.

I thank you, Mr. Chairman. I thank the witnesses.

Chairman LEVIN. Thank you very much, Senator McCain.

Senator Lieberman.

Senator LIEBERMAN. Thanks, Mr. Chairman.

First let me thank the four witnesses for the service that you do to our country. It's I think largely unknown, unappreciated, but extremely critical to the security of the American people and the security of a lot of people elsewhere in the world.

Look, we'd all like to—we all wish that we lived in a world without nuclear weapons, but wishing does not make it so. Unless there is—as you look around the world, it seems that the conflicts between people and nations grow and that, once again, the nuclear weapons capacity seems to be growing. That is, after the reduction after the collapse of the Soviet Union.

So while I for one am in the process of reviewing the START, the New START Treaty, and hope that I can be in a position to vote to ratify it, it seems to me that, based on what we know about the reality of the world today, that as we reduce the number of nuclear weapons, deployed weapons in our stockpile, we've got to make sure that, to put it in simplistic terms, they work. That's what this really is all about.

Incidentally, as you well know, just to state for the record, there are a lot of people in the world who depend on the safe, secure, and effectiveness of America's nuclear stockpile for their own security. In fact, the safety, security, and effectiveness of our nuclear stockpile is one of the major inhibitions or blocks to more nuclear proliferation, because there are nations in Asia and the Middle East particularly that have not developed their own capacity because they rely on our protection. So what we're talking about here is really important.

Dr. Hommert, you said something that I thought was really important, which is that most of the weapons—because a lot of this is education or re-education for members of Congress—most of the weapons in the current stockpile—I'm quoting from you—″were de-

signed at a time when long design life was not typically a high priority design requirement."

I heard from someone who's an expert in this field that I talked to the other day that today the average age of the nuclear weapons in our stockpile is older than it's ever been before. Is that right?

Dr. HOMMERT. Yes, sir, that's correct.

Senator LIEBERMAN. So that's part of the pressure on us to make the kinds of investments that we're talking about and that the four of you have asked for, correct?

Dr. HOMMERT. Yes, Senator.

Senator LIEBERMAN. Other nations have gone in other directions in the development of their nuclear weapons stockpiles, correct?

Dr. HOMMERT. Yes.

Senator LIEBERMAN. Okay. Now let me go to Dr. Miller. You point out in your prepared statement that the NNSA's budget crunch that we've imposed on you in recent years has—and I'm going to mention two parts of what you said—″postponed important deliverables in science, technology, and engineering." To the extent that you can in open session, Dr. Miller, give us a little more detail on what you meant?

Dr. MILLER. Yes. Part of the science, technology, and engineering program, what we call the science-based stockpile stewardship program, is intended to understand in a more fundamental way the workings of a nuclear weapon. It is in many respects the key intellectual challenge. The delivery of that understanding has been delayed from what was originally anticipated because of the slower pace of work.

An example of what I'm talking about, again in an unclassified form, a scientist from Livermore whose name is Omar Hurricane this year received the E.O. Lawrence Award from Secretary Chu. The details are classified, but he received that award for proposing a theoretical solution to one of these weapons physics challenges. That theory has yet to be validated because the experiments that would validate that theory have not yet been done. So that's an example of the delays that I was talking about.

Senator LIEBERMAN. The next phrase in your statement is that the budget crunch you've been under "has delayed resolution of identifiable stockpile issues." Did you cover that in your answer to the first one?

Dr. MILLER. It's similar. The answer is we—the more detailed answer is we look at the stockpile every year, all three labs, the plants. We find what we would call politely "anomalies," things that are different than we expect them. We have to answer the question of does that matter? Again, it's like a piece of rust on your car. It matters where it is and how big it is. The time for resolving those issues has been longer than I think is justified.

Senator LIEBERMAN. Let me ask. One of the bottom line questions for me, anyway, in this matter is that, since we're discussing the sustainability of our nuclear deterrent under the New START Treaty, I want to ask the three directors the most objective question based on budget that I can, which is about fiscal year 2011. Implicitly, I'm asking about the kinds of goals that are set for longer range funding.

But here's my question. If Congress fails to provide the increased funding requested in the fiscal year 2011 budget and described in the section 1251 report, are you certain that our National laboratories will be able to continue to certify the safety, security, and effectiveness of the smaller stockpile envisioned in the New START Treaty without testing?

Dr. Anastasio?

Dr. ANASTASIO. Senator, if that were the case I would be very concerned about the future. One of the things that has been happening in recent years with the budget scenarios that we've faced is that, with the focus on the stockpile, the urgency of the near term, the concerns about the state of our facilities, we've been squeezing more and more on the science, technology, and engineering part of the budget. That is the investment in the long term. The activities that we're able to carry out today are based on the investments we made 5 and 10 years ago.

Senator LIEBERMAN. My time is actually up, so let me ask a quick question. In other words, really it's this, if I can narrow it. Are you concerned that if we don't meet the funding increase goals that we're talking about for fiscal year 2011 and beyond that you may reach a point where you won't be able to certify the safety, security, and effectiveness of our nuclear stockpile without testing

Dr. ANASTASIO. I'll be very concerned about my ability to do that. We will be in a position where we're not looking at the issues, and so if you don't look you don't know what the issues are. The tools that we have available for us may well not be adequate to answer the questions that are before us.

So it's both important what the near-term budget looks like, but it's important that we understand the funding over the full life of the program, which in this case is several decades long.

Senator LIEBERMAN. Right.

Dr. Miller, Dr. Hommert, can you give a quick question? I apologize because I know it's a big one. A quick answer.

Dr. MILLER. I guess I would point you to some testimony that I gave a couple of years ago to the Senate, in which I said that if the funding trends continue it is my judgment that the fundamental premise of stockpile stewardship is at risk.

Senator LIEBERMAN. Thank you.

Dr. MILLER. I believe that's true.

Senator LIEBERMAN. Thank you.

Dr. Hommert?

Dr. HOMMERT. Without the '11 request, we will see immediate impact on the strength of our surveillance program and very much on our ability to sustain the B61 as a viable weapons system through the decade.

Senator LIEBERMAN. Thank you all.

Thanks, Mr. Chairman.

Chairman LEVIN. Thank you, Senator Lieberman.

Senator Inhofe.

Senator INHOFE. Thank you, Mr. Chairman.

Mr. Chairman, we have sent a letter to you requesting a hearing on the treaty. I just want to get this in the record. I also serve on the Foreign Relations Committee. We've had I think about 12 hearings. We've had 25 witnesses. Although two of the witnesses were

kind of open; they had some objections—that was Robert Joseph and Eric Edelman; we all know them—the other ones, there was not one witness who was opposed to the New START Treaty.

So the request I have—and the request has been signed by some 11 members—that we hold a hearing where we will have some of the witnesses, and we even made some suggestions. So I'm hoping we'll be able to do that.

Chairman LEVIN. We're hoping also to be able to do that.

Senator INHOFE. Yes.

Chairman LEVIN. We've been working with the minority on the witnesses. The dates which—

Senator INHOFE. I appreciate that and I know you will. We went through this—

Chairman LEVIN. Well, if I could just complete my sentence.

Senator INHOFE. I'm sorry.

Chairman LEVIN. The dates which we proposed, they were not able to make it. So we are working closely with minority and minority staff to make it possible, because we also want to make that happen. So we'll continue to try to work with those witnesses.

Senator INHOFE. Mr. Chairman, this is not any way a partisan suggestion, because we went through this same thing on the Law of the Sea Treaty and that was actually proposed during the Bush Administration, and we had from the Foreign Relations Committee no one opposed to it. But we did then hold hearings, very productive hearings, on that. So I appreciate that very much.

Chairman LEVIN. We are trying very hard to make that happen. I agree with you, it's not a partisan issue.

Senator INHOFE. Yes, sir.

Getting back to the budget, because we've all talked about that and we talked about the adequacy and the fact that previous budgets were not adequate. Yet it appears to me that most of the increases that I see here are really in the out years. The National Security Enterprise Integration Committee in its recommendation had recommended, I believe, in fiscal year 2011, 2012, and 2013 7.3, 7.8, 8.3, and yet it was reduced substantially in the President's budget for those particular years.

So when you talk about the adequacy—I'd like to have each one of you respond to this—are you talking about it would be in the out years? The administration has proposed a budget increase of $10 billion over 10 years, a total of $80 billion. Yet under the administration's projections 70 percent of the $10 billion increase will not show up until fiscal year '16. Is that a concern to you, or do you think that—are you perhaps looking at these future years in terms of the adequacy of the budget?

Dr. ANASTASIO. Senator, I'm very concerned about that budget profile, that there needs to be adequate funding to align the expectations of the program with the fiscal realities that we have. That profile delays many of the issues that are of concern to us, especially in the science and engineering arena.

But the key is for any program any particular year is an interesting question, but the question is really what's the profile look over the full extent of the multi-decade program.

Senator INHOFE. And keeping in mind that there's no assurance that that will be there in out years.

Dr. ANASTASIO. Correct, I understand that, especially with the fiscal environment the country faces. So that is a concern and we understand that.

I think it's important that in the near term as we go through this period, that if those budgets are the reality that we have a balanced program during that time and that we don't sacrifice one part of the program to accomplish another.

Senator INHOFE. I understand that.

Dr. Hommert, you probably talked about the B61 more. I always feel a little inadequate when we have experts like you, that there is probably an assumption that you think we know more than we do know. On this B61 program, in talking with my MLA earlier today, he was dropping those out of F- 111s 25 years ago.

Now, I assume that we've had a lot of technological improvements, but it's more of a complete overhaul that you've been referring to. Is that adequate—or accurate?

Dr. HOMMERT. Yes, Senator, that's accurate. We need to in my view execute the full-scope refurbishment and replacement of nonnuclear componentry.

Senator INHOFE. And are you confident you're going to have the resources to do that?

Dr. HOMMERT. The fiscal year 2011 budget—let me answer that in two steps. The fiscal year 2011 budget allows—does have the resources for us to very critically complete, in our vernacular, what we call a Phase 6–2A, or a costing study—

Senator INHOFE. Okay.

Dr. HOMMERT.—which firms the requirements and sets the cost basis. Then through the rest of what we call full-scale engineering development out through '17, we then will have a firm picture. We'll have to have sustained commitment from here to there to execute this program.

Senator INHOFE. Okay. I would agree with that.

You mentioned, Dr. Hommert and also Dr. Anastasio, a problem that I really wasn't aware of until we started preparing for this hearing, and that is what's happening to our technological base, the people, the scientists, is that we're not replacing these. I think you said that some 38 percent will be over 55 years old. Is there an adequate base, or what are we going to draw from? Do we have a program going to resolve that problem?

Dr. ANASTASIO. Well, sir, I think that depends—

Senator INHOFE. A recruitment type of—

Dr. ANASTASIO. Yes. Certainly we have a very outstanding work force and we're still able to attract very good people. But the question is, with the budgets that we've had—and we mentioned the reductions that we've had at the laboratory—right now we're doing very little to renew and replace turnover with new people in the work force.

Senator INHOFE. So you don't think we're really competitive then, are we?

Dr. ANASTASIO. We are competitive at the moment, but I'm worried about the future. That's my concern.

Senator INHOFE. Do you all agree with that?

Dr. MILLER. Yes, sir. Again, I think at Livermore we live in a very dynamic area, the Bay Area of San Francisco. But we have

historically been able to recruit and retain people in the nuclear weapons program. Our decline is principally financially, financially driven. So if the commitment on the part of the country is there, we as a laboratory can deliver what's expected of us in terms of bringing in the highest quality science and technology.

I would just comment, and to the earlier question on the issue of the long-term sustainability, I think I am also very concerned about the out years. An additional reason that I am concerned is because most of these major projects that are taking up funding in the out years do not yet have very good cost baselines.

Dr. Hommert talked about the B61. The same thing is true for the major facilities. That generates a tremendous amount of uncertainty in our minds about not only what the costs are, but equally as important what are the resources that are going to be required.

Senator INHOFE. That's good.

Dr. Anastasio, just one thing that you mentioned twice in your oral testimony. You used the term "acceptable level of risk" and "adequate level of risk." Could you just make a short comment on how you define the risk and what is adequate or acceptable?

Dr. ANASTASIO. Sir, of course there's very many different types of risk and we face that every day, as you do in your job as well. There is the technical risks, there are the programmatic risks of funding, there are the risks of surprises that you don't anticipate. How do you manage your way through all of those issues?

Acceptable levels of risk. It's certainly true as a scientist that we are taking technical risks in what we do. We're not doing a nuclear test. We're not testing the full system. We already talked about what the path forward will take for refurbishments, life extensions. But I believe when I say "adequate levels of risk," I believe that the risks are there. There is not a no-risk version, that the risks that are there are manageable, and that we can deliver on our responsibilities.

Senator INHOFE. That's fine. My time has expired, but for the record, Mr. Chairman, I'm going to ask each one to take the letter from these previous directors and kind of respond in writing as to how you disagree with these assertions that were made, if you would please do that.

Thank you very much.

[The information referred to follows:]

Chairman LEVIN. Thank you. That will be asked of our witnesses for the record.

Senator Ben Nelson.

Senator BEN NELSON. Thank you, Mr. Chairman.

Thank you, gentlemen, for being here today and for the opportunity yesterday to previous the conversations we're having today.

The question of funding is always going to be at issue because of the way in which budgeting is accomplished at this level, because we don't have multi-year budgets. You are concerned about the future, as we all are, because the next year and the following year we'll have to sustain the level of funding that we've started in order for you to fulfil your obligations.

Do you have any reason other than concern about the way in which budgeting works that there won't be this commitment in the future to fund the program so that you can deal with compliance

and the requirements that are there? In other words, apart from just the uncertainty of the budgeting process, is there anything else out there that would cause you to believe that we won't fund at that level? Dr. Anastasio?

Dr. ANASTASIO. I think one thing that could help contribute to sustainability of these programs for the future, first in my mind—there are several things in my mind. One would be the National consensus on the policy. The administration has brought forward a nuclear policy view with the Nuclear Posture Review. If that can serve the basis of a national bipartisan consensus on the path forward, then there's a baseline understanding of what we're all trying to accomplish, and that will help guide all future Congresses and administrations about what we're trying to do.

I also believe that it'll be important to keep our focus on these issues, and how do we do that? I'm not sure I know the answer, but one kind of suggestion would be to have a hearing like this over the years.

Senator BEN NELSON. There is something about things getting on the record—

Dr. ANASTASIO. Yes, sir.

Senator Ben Nelson:—that provides some degree of certainty.

Dr. ANASTASIO. Another, a third suggestion, is some treaties in the past have had safeguard approaches that are built into those. Those could be another kind of approach that we could take to allow the administration and Congress and the American people to keep a focus around these issues to make sure we're on track for what we're trying to accomplish.

Senator BEN NELSON. It won't do us any good to go 100 miles north one year and 100 miles south the next year on funding or on the structure of what your work would be with keeping the stockpile current.

Dr. ANASTASIO. I would agree with that completely, and that would be a very challenging environment to be in to maintain an outstanding work force as well.

Senator BEN NELSON. Does anybody have anything different to say or are you generally in agreement?

Dr. MILLER. I would say I'm very much in agreement with what Mike talked about. I think, as he indicated, there are a number of mechanisms that seem to me to be available to the Congress to maintain sustainability.

Another example is in the context of the National decision to stop doing nuclear testing. There is an annual assessment that each of us do of the stockpile each year. It's classified. It's prepared. It is made available to all levels of government, again a status report on how are we doing, what are the issues. So again, I believe there are multiple mechanisms available to create the kind of consensus and stability and understanding and focus.

Senator BEN NELSON. Dr. Hommert?

Dr. HOMMERT. I agree with my colleagues. I would just add that if we get '11 right and begin the LEP program, it creates a momentum very visibly for moving down that path, which hopefully will again create a basis for greater sustained support, in addition to what my colleagues have added.

Senator BEN NELSON. At the very least, I think it's accurate to say that the '11 budget is reversing the negative trend that you've experienced with budgeting in the past. Is that fair to say, too?

Dr. HOMMERT. Yes.

Dr. MILLER. Yes, sir, it is.

Dr. ANASTASIO. Yes, sir.

Senator BEN NELSON. In monitoring through the START Treaty, the new one, can you give us your efforts of how we would monitor if we didn't have the New START Treaty? Do we have any capability of monitoring that would be exclusive of, let's say, the New START Treaty?

Dr. MILLER. Yes, sir. The START Treaty has, as you know, some very specific provisions. We do gather intelligence through national technical means, satellites and other mechanisms. Laboratories, all three laboratories, work with the community to analyze that. I think it is fair to say that the treaty does add to the ability to inspect sites, so it significantly adds to that. But there is capability to understand what's going on independent of the treaty.

Senator BEN NELSON. But the New START Treaty would enhance your ability to monitor, is that fair to say?

Dr. MILLER. Yes. It's not ours, but, yes, the country's ability to monitor.

Senator BEN NELSON. Dr. Anastasio?

Dr. ANASTASIO. I would agree with that, yes, sir. This is not—we don't have the lead role for the country in that. That's done by other agencies. But we are very much supportive of that, and I would agree that with New START we will have further extended opportunities to understand.

Senator BEN NELSON. A final question here. My time is up. Do each of you support the New START Treaty?

Dr. ANASTASIO. Sir, I think as a lab director—

Senator BEN NELSON. As a lab director?

Dr. ANASTASIO. As a lab director, it's not really my position to support a treaty. That's not our role. But I believe that with the treaty outlined and the program that the administration has put together that with we can carry out all our responsibilities that are underneath the treaty if we can deal with these long-term sustainment issues. So in that context, I'm very comfortable with the treaty.

Senator BEN NELSON. Dr. Miller?

Dr. MILLER. Yes, sir. My view is very similar. My job as a laboratory director is to provide the government, the Congress, the administration, my best technical advice. Under the treaty, I can do the job that has been outlined for me. Similarly, we were part of the concurrence in the NIE about the monitoring of the treaty and we concurred in those key judgments.

Senator BEN NELSON. At the risk of getting you into politics, too, Dr. Hommert, what are your thoughts?

Dr. HOMMERT. Very consistent with my colleagues. I would just highlight that the treaty, as I said in my oral testimony, the treaty highlights the imperative of what we're talking about here today in terms of moving forward on strengthening the basis of the deterrent.

Senator BEN NELSON. Thank you all.

Thank you, Mr. Chairman.

Chairman LEVIN. Thank you very much, Senator Nelson.

Senator Sessions.

Senator SESSIONS. Let me start with the question—Dr. Miller, I missed, I think, Senator Nelson's question, that you agreed that it would enhance our ability to monitor. Are you saying the New START Treaty would enhance the United States' ability to monitor the actions of the Russians?

Dr. MILLER. Yes. Our ability to monitor the actions of the Russians is enhanced over not having the treaty. That was my view.

Senator SESSIONS. Over current? Are you saying it's enhanced it over current monitoring abilities?

Dr. MILLER. Yes. Currently, of course, since the START Treaty is no longer, the original START Treaty is no longer in effect, we have no on-site inspection rights, and the START Treaty would put those back into place.

Senator SESSIONS. Some of them. Former Secretary of State James Baker has raised questions and experts have, and it's pretty clear that we will not have as good an ability under New START as under previous START to monitor the Russians. Do you disagree with that?

Dr. MILLER. That's a different question.

Senator SESSIONS. Right. Let's get this straight. The impression here is being left that's not very accurate, I think.

Dr. MILLER. Again, the question that I answered earlier was over current, in which case we have no inspection rights, is this better? The answer, my answer to that, was yes. There are differences between the previous START Treaty and the proposal under the New START Treaty. As I said in my testimony in answer to the question, we did engage in the coordination of the National intelligence estimate and did concur in their key judgments.

Senator SESSIONS. Well, I would just share my colleague's concern, Senator Inhofe, about the out years. When you talk about something in this body dealing with years 6, 7, 8, that is like fantasyland. That's through the looking glass. We have no ability to count on what will happen in those years.

This committee voted, Dr. Anastasio, I think close to sufficient funding on a reliable replacement warhead and other matters, but other committees took it out and we eventually lost that. I do think you've taken too much hits, too many hits, all of you, in the last several years, and not a very smart way to do it.

I was troubled particularly, Dr. Anastasio, in your comments that you've been having to squeeze more on the science and technology part of the budget. To me that's particularly concerning. Indeed, the new spending that's sort of projected in this budget seemed to me to be on the construction of facilities and buildings and not much earmarked for the science and technology.

Do you think we've struck the right balance there, assuming all this money actually were to be appropriated in the distant future?

Dr. ANASTASIO. I certainly think that I agree with you, sir, about the uncertainty of budgets 6 or 7 years from now. Of course, you have much more experience in that than I. But that is a concern to me. I have testified in the past, in 2008, that I've been very con-

cerned about the sustainability of the program over the long term if we didn't fix this.

I think the budget in the fiscal year 2011 proposal is a start to that fix, but as a good program manager you know it's what's the lifetime of the program and the funding over that. The money that's allocated to the new facilities and to the stockpile is important because those are issues that need to be addressed, but I do fear that there has been a history of having an imbalance in the program and we've sacrificed the science to the near-term deliverables, and that we need to align our expectations of what's really possible in a fiscal sense with what needs to get done and make sure we do that in a balanced way, and that our appetite is aligned with what's achievable.

But I'm very concerned that the out year funds will be there and then, as Dr. Miller said, we even don't have baselines yet for the significant costs of these major efforts about the life extensions or about the nuclear facilities. So you would want to be able to expect that as those baselines are adjusted to the realities that you have, then you'd like to be able to adjust the budget to that as well.

Senator SESSIONS. Dr. Schwitters indicated that, well, we may be good for a decade or so with this maintenance, I guess, of the current stockpile. But if it were good for 15, 20 years more, don't we today need to be thinking about when and how we're going to need to replace what at some point appears to me would become outmoded or at risk?

Dr. ANASTASIO. We certainly need to be able to today start taking actions to refurbish the stockpile for the future.

Senator SESSIONS. In the National—just to say this, because time is short here. The Nation needs to be very mature about this and to develop a long-term, 20, 30, 40-year plan to go forward, would you not agree, that is rational and make sense?

Dr. ANASTASIO. absolutely.

Senator SESSIONS. The only problem is the three of you, if the President had his way, you wouldn't have a job, because he wants no nuclear weapons. It's his stated goal, and this makes us all a bit nervous about what our future is.

I think it's clear with regard to the New START Treaty that this treaty will not be ratified unless we have confidence that we have a plan in place to maintain and modernize and replace if needed our nuclear weapons.

My time is out, but thank you, Mr. Chairman. That's my concern.

Chairman LEVIN. Thank you, Senator Sessions.

Senator REED.

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

Dr. Anastasio, my understanding is that the goal of the Nuclear Nonproliferation Treaty, which has been in effect for many years, is the elimination of nuclear weapons. Is that accurate?

Dr. ANASTASIO. I'm not an expert on the Nonproliferation Treaty, sir, but I think it sets out a goal of a world that's free of nuclear weapons, that's for sure.

Senator REED. So this is not some current trendy, sheik thing that the President's talking about.

Dr. ANASTASIO. I will say that the administration has made clear as well that on our path to a world without nuclear weapons, if we

could ever achieve that, that we must maintain a safe, secure, and effective stockpile on that path. I must say personally, I have a hard time imagining what the world—it would be a very special world that's a world that's free of nuclear weapons, now that we have figured out how to do that.

Senator REED. Let me ask you. We've been talking a lot about the out years, but the Secretary of Defense just on June 17th announced a transfer of $4.6 billion to NNSA. The 2011 budget represents a 13.5 percent increase. Is this the first significant increase in funding you've had in many years to the NNSA enterprise?

Dr. ANASTASIO. Yes, sir.

Senator REED. So interesting to talk about the out years, but in fact this is the first administration that has made a significant commitment of resources—well, the first in a long time—to actually begin to address the issues with real dollars of the nuclear enterprise; is that correct?

Dr. ANASTASIO. I believe that this NPR and the budget for 2011 proposal is a strong commitment on the part of the administration, and I'd let my colleagues—

Senator REED. Dr. Miller?

Dr. MILLER. Yes, sir. It is clearly a major step in the right direction. The budget has been declining since about 2005. At the time the original stockpile stewardship program was put in place in the early to mid-90s, there of course was a substantial increase at that time. However, as you have noted, since 2005 there has been a steady decline, and this represents a very important and very significant turnaround.

Senator REED. Dr. Hommert?

Dr. HOMMERT. Yes, I agree that the budget represents a significant change that we haven't seen recently. It also comes accompanied with a commitment to managing the stockpile forward, which is equally as important.

Senator REED. Dr. Schwitters, your comment?

Dr. SCHWITTERS. I really have nothing to add.

Senator REED. Thank you.

Let me go down and ask each director and Dr. Schwitters. If the START Treaty, the New START Treaty, is ratified, will it have any significant impact on your proposed plans?

Dr. ANASTASIO. What it does is emphasize the importance of the role that we play and the significance of the underpinning of the stockpile and our confidence in it. I hope Congress takes the actions that the administration has suggested.

Senator REED. Dr. Miller?

Dr. MILLER. It certainly does not inhibit the work that we have to do and, because it is a package that emphasizes the importance of maintaining the safety, security, and reliability of the stockpile, it enhances that part which is our technical responsibility.

Senator REED. Dr. Hommert?

Dr. HOMMERT. I agree with my colleagues.

Senator REED. Any comments, Dr. Schwitters?

Dr. SCHWITTERS. No, sir.

Senator REED. Let me just ask the opposite question. If it's not ratified, what impact will it have on the enterprise?

Dr. ANASTASIO. For me then, that will put in question whether we have the consensus strategy to go forward. If that's not the path that the country's taking, what will be the path? So I think it will lead to some uncertainty.

Senator REED. Dr. Miller?

Dr. MILLER. Yes, sir. I think the uncertainty is really the issue. Again, I can't emphasize enough—like I said several times, I will just repeat it—that having an agreed-upon long-term vision for the future of the nuclear weapons stockpile is very important to the stability, to the engagement of the work force.

Senator REED. And Dr. Hommert?

Dr. HOMMERT. Clearly it doesn't change the technical realities we're staring at in the stockpile. But there is the question of the importance of a consistent national policy going forward, and that I think would be what would come into question.

Senator REED. Dr. Schwitters?

Dr. SCHWITTERS. If I could just say a little bit on this. Of course, JASON studied the technical aspects of this. This is not my responsibility, but we did identify, outside of our narrow charge, these issues of the scientific and technical manpower, that sustainability, and we also identified real concerns about surveillance. So under any scenario, those are high on our priority list that have to be maintained.

We were, of course, pleased with Secretary Chu's commitment to this body on his views on this. That's all I care to say.

Senator REED. Thank you.

Let me ask a final question. Sometimes we dwell, which we should, on the problems that we have, particularly since we have not tested a device, thankfully, for many, many years. If you put yourself in the place of your counterparts in Russia or in China, do they have the same problems in terms of deteriorating skills, deteriorating systems, particularly Russia since that's the focal point of the New START Treaty?

Is their nuclear enterprise in the same sort of situation as ours technically?

Dr. ANASTASIO. Sir, I believe that the Russians went through a period of time some years ago of very strong challenges on their budgets. They have recovered from that, is my best insight. They are modernizing their stockpile and they have a very active program and have hired many new people.

Senator REED. Dr. Miller?

Dr. MILLER. I would just add that from a technical point of view they have the same kind of issues that we have. The nature, the materials, are all very similar. They handle it in a very different way than we do. They have—whereas we are looking for major reinvestment in the production facilities, they have a very excellent production capability that has been functioning throughout this period. So their approach is different than ours, but the technical issues that have to be resolved are very similar.

Senator REED. And Dr. Hommert. My time—the chairman has been very gracious with my time. If you could respond in writing, that's fine.

Dr. HOMMERT. Consistent.

Chairman LEVIN. That would be great.

The vote has started. I think we probably have something like 10 minutes left in the vote, plus the additional 5. So I'm going to call next on Senator Thune. Senator Chambliss, I think there will be enough time for your round if Senator Thune will stick to the 6-minute rule. Then, if no one else shows up, we'll be able to finish the open session and move to closed session.

Senator Thune.

Senator THUNE. Thank you, Mr. Chairman.

Thank you all very much for your service and for being here today and for the insights that you provide on what is a very important subject and something that many of us want to make sure that we get right.

Dr. Anastasio, you in your testimony stated that at Los Alamos the average age of career employees is now over 48 and that 32 percent of all career employees are expected to retire within the next 5 years. In fact, General Kevin Chilton, the current head of Strategic Command, said 2 years ago that the last nuclear design engineer to participate in the development and testing of a new nuclear weapon is scheduled to retire in the next 5 years.

Does this cause you some concern?

Dr. ANASTASIO. Yes, sir. It's very much in the issue of how do we renew the really outstanding work force that we have and how do we give them the challenges that they need to develop their full skill set.

Senator THUNE. What are you doing under the current limitations of experimenting and testing in order to preserve the nuclear design expertise?

Dr. ANASTASIO. Well, part of what we do is to analyze the state of the existing stockpile. That's been a large focus of our program for the last 15 years. Unfortunately, that does not challenge their creativity for design, and that's an element that's been missing from the program.

Senator THUNE. Can you describe the relationship between the limitations placed on continuing to pursue scientific advances and your ability to recruit younger individuals to pursue this type of career?

Dr. ANASTASIO. I think one good example for us at Los Alamos, of course, is you need a window. Los Alamos, appropriately, from its history is a very isolated place in the country and we need a way to attract people to want to come visit and engage with us. We've had a major experimental facility there called the LANSCE, Los Alamos—it's a proton accelerator to study material properties. We're challenged to keep that facility in the same state that it needs to be; and the facilities that we have running, we have trouble doing all the experiments, having adequate funding to do all—to maintain the facility and to do all the experiments we'd like to do.

That's the mechanism to bring in, to attract people there, and then to sometimes induce them into coming into some of our classified programs.

Senator THUNE. What impact are some of these near- term retirements going to have on the knowledge level required to certify the reliability of nuclear weapons?

Dr. MILLER. Senator, I think the retirement is obviously something that is of concern. We have programs in place to transfer that knowledge. Frequently, people who retire are willing to continue to come back and mentor young people. So from my point of view, the most important issue in responding to your question is do we have the financial ability to hire the young people to accept the transfer of the new knowledge. I think we know how to do that if we have active programs. Again the ability, as specified in the NPR, as we do life extensions to examine the full range of possibilities is a very engaging and very important subject. One of the very important side benefits of having gone through the study phase of the RRW that we did is it really engaged the creativity of the design community to say, what could we do, what is possible.

So that full range of capability as expressed in the need to bring forward options for the life extension programs is very, very important to me.

Dr. HOMMERT. Can I just add that this issue of sustaining intellectual capability is sort of a paramount concern for me. I think we're at a critical juncture here where in order to attract young engineering and science talent—these are individuals that want to do real work—the stockpile demands that we do real work, and we need to proceed, and that will bring the talent we need to bridge this experienced to inexperienced relationship.

Dr. ANASTASIO. Senator, could I add one more point which I think is very important? For our scientists especially that get involved, and engineers, at the lab, they get involved in these classified programs, they're giving up their visibility into the broad technical community because they're working on classified issues. That's a big step for someone to make, that we all made in our careers. The feeling at the laboratory that we're working on something that's really important for the country is a really important issue to be able to attract good people. If there's not the feeling of commitment, a thing that's been lacking in the last 15 years, that this is an important activity for the National interest—and I think with the policies that are being brought forward, if they can be implemented, that would be a way to reassure the work force that this could be a significant career move for them to make and help us attract the good people.

Senator THUNE. Very quickly, Doctors Miller and Hommert, the status with respect to age and retirement of your work force? Is it similar to what Dr. Anastasio described in his testimony?

Dr. MILLER. Yes, it's very similar.

Dr. HOMMERT. Yes, we have similar statistics as well.

Senator THUNE. Thank you.

I will let Senator Chambliss go.

Chairman LEVIN. We appreciate that, and questions for the record would be welcome.

Doctor—"Doctor Chambliss." Senator Chambliss.

[Laughter.]

Senator CHAMBLISS. I can't even spell "nuclear physics," Mr. Chairman.

Gentlemen, I want to pick up on this issue of your personnel, because I know that, Dr. Anastasio and Dr. Miller, you have said that you've lost approximately 2,000 personnel each since fiscal year

2006. Dr. Hommert, I assume you're down somewhat. Is it comparable to that?

Dr. HOMMERT. About 800 out of the weapons program directly.

Senator CHAMBLISS. Looking at you, you're like me; you're greyheaded, what hair we have left. Dr. Hommert, I'm with you there. But when you gentlemen came into this program it was on the upswing you were challenged to develop systems based on ideas that you could come up with. I'm sure it was an exciting time for you and the colleagues that you had the opportunity to work with.

Now, nuclear physicists coming out of Georgia Tech in my State, if they go to work in a lab it's going to be working on maintaining a system. It's not the excitement from the standpoint of the day to day work, it appears to me. I think you've got a real challenge there. Not that you can't meet it, but it looks to me like that's going to be very difficult to be able to continue to draw folks into the field of science and physics and challenge them in the work that they're going to be doing in your labs.

Do the numbers in the budget that have been proposed allow you to begin hiring folks back that you've had to let go?

Dr. HOMMERT. Let me take a crack here. Certainly for us the '11 budget would demand that, for example, in the main LEP line, we'll have to double the staffing where we are today. That will attract individuals into the weapons program. The nature of the work itself, where we have the opportunity to bring new technology, is exciting and challenging to staff.

The last point I'd make is that at Sandia we have a range of other national security activities that we do which in a technology space are very similar to what we have to pull on for the weapons program. That all combined, but we still have to have that imperative of moving forward on the LEP, do provide a basis of a strong intellectual capability. So I'm confident that if all the pieces come together we can do that.

Dr. MILLER. Yes, sir, my answer is very similar. The increase in the fiscal year 2011 budget is small for us, but it is real. In addition, the prospect of working on the life extension of the system after the B61 is very important to us because it gives us—that does exercise not quite all, but it does exercise the creativity, the intellectual curiosity, as well as, importantly, the engineering discipline of actually turning your ideas into something real.

So the program of work and the budget I think gives me the capability to carry out the function as you described it.

Dr. ANASTASIO. I agree.

Senator CHAMBLISS. We haven't had a test on any of our systems since 1992. How much longer are we going to be able to go without testing? Dr. Anastasio?

Dr. ANASTASIO. I think, with the way this program is defined, with the flexibility that we have, and if we're adequately funded and appropriately funded through the life of this program, I think we can continue down this path for quite an extended period.

Senator CHAMBLISS. Anybody disagree with that?

Dr. MILLER. No. What I would say is that as long as we have the ability to continue to make progress on understanding the underlying science and technology and the flexibility to manage the stockpile appropriately, that gives us the ability to continue with

the program as it's currently laid out, that we can do our job without having to resort to additional nuclear tests.

Dr. ANASTASIO. Sir, be sure that we feel very strongly that it's our obligation, if we ever doubt that that's the case, that we will bring that forward to decisionmakers.

Senator CHAMBLISS. When is the last time we manufactured a nuclear warhead?

Dr. MILLER. Let's see. The most recently completely from scratch manufactured nuclear weapon would have been the W88, which occurred in the late 80s and early 90s. We have manufactured components through the life extension programs for the W87, the B61, the W76. So we've remanufactured components, but not from scratch, since the W88.

Senator CHAMBLISS. Do we have the capability today to manufacture one from scratch?

Dr. MILLER. We do, but in limited numbers.

Senator CHAMBLISS. We've got two facilities, one, Dr. Miller, at Los Alamos, one at Oak Ridge, that are planned for construction. What additional capabilities will those two facilities give us?

Dr. ANASTASIO. For the one at Los Alamos, the CMR replacement facility, that will not give us new capability, but it will be a smaller version of the capability that currently exists that was built—it opened in 1952. That's a very old building that does not meet current safety and security standards, and this would be a replacement for that facility that is right-sized for the capability we need today. The capability it represents is to give us the scientific understanding of the chemistry and metallurgy of very complex materials like plutonium. So it makes us understand the plutonium and assure the country that the material in our weapons is behaving the way we can expect and that we understand how that goes forward. Plutonium is material that has only existed to our knowledge for 60-plus years, so there's still plenty to learn about that material, and this is the facility in which we do that.

Senator CHAMBLISS. I appreciate your statement about the fact that I believe you said you don't yet have all the cost estimates on these facilities, because frankly it's going to take about 10 years to construct both those. And I've seen the numbers, $4.5 to $5 billion each. That makes this budget issue critical. Your being able to hire or continue to hire the right kind of people makes this budget critical. We've got to get some level of confidence that you're going to have those funds, because obviously you haven't had. They've got to be there in order for this treaty to work.

I'll just close, Mr. Chairman, by saying that one of the other things I'm concerned about in this treaty is the inspections under New START. I assume it was not uncommon for the Russians to be in your facilities on a fairly regular basis under the previous treaty, as we were, at least on the outside and occasionally on the inside, at places like Votkinsk. Now we're going to depend on the Russians to tell us what they're doing, just as you're going to be telling the Russians what you're doing. I have all the confidence in the world you're going to tell them the truth. I think there are still some issues relative to the Russians.

When you have a total of 18 inspections a year under this treaty or a total of 180 over 10 years, versus the over 600 that we did

under the previous treaty, I think there are some real inspections and trust issues that are going to have to be resolved before we can get this treaty completed.

But gentlemen, thank you for the work you do. I have not been to the labs of any of you, but I intend to, and I look forward to visiting with you on site. Thank you.

Chairman LEVIN. Thank you very much, Senator Chambliss.

We are now going to close our open session. We very much appreciate the testimony of all of our witnesses. There will be additional questions for the record. And we will now move. Perhaps 15 minutes from now, if you could all get to Room 217, the Senate Visitors Center, we will have our closed session in Room 217.

We will stand adjourned, with thanks.

[Whereupon, at 11:26 a.m., the committee adjourned.]