# HEARING TO RECEIVE TESTIMONY ON NATIONAL NUCLEAR SECURITY ADMINISTRATION MANAGEMENT OF ITS NATIONAL SECURITY LABORATORIES

**WEDNESDAY, APRIL 18, 2012**

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

The subcommittee met, pursuant to notice, at 2:29 p.m. in room SR–222, Russell Senate Office Building, Senator E. Benjamin Nelson (chairman of the subcommittee) presiding.

Committee members present: Senators Nelson, Inhofe, and Vitter.

Majority staff member present: Jonathan S. Epstein, counsel.

Minority staff member present: Daniel Lerner, professional staff member.

Staff assistants present: Hannah I. Lloyd.

Committee members' assistants present: Ryan Ehly, assistant to Senator Nelson; Anthony Lazarski, assistant to Senator Inhofe; and Charles Brittingham, assistant to Senator Vitter.

## OPENING STATEMENT OF SENATOR E. BENJAMIN NELSON, CHAIRMAN

Senator NELSON. Let me today call the hearing to order.

Senator Sessions is in a budget hearing at the moment, so he is not going to be able to join us, but Senator Inhofe is a member of the committee and he will be joining us shortly. In the meantime, I thought we might get started.

I have two cans of pop here. I do not intend to drink both of them, but when there is only one and you run out, you do not have a successor. So it might be a two-drink hearing. [Laughter.]

But the purpose of today's hearing is to examine the relationship between the National Nuclear Security Agency, or NNSA, and its national security laboratories. We had a similar hearing on this topic on March the 14th with the NNSA, and today it is the national security laboratories? turn to comment on this relationship.

We also have as a witness the Chairman and Vice Chairman of the National Academies of Science panel that examined how this relationship is affecting the quality of science and engineering at the labs.

Let me thank all of you for agreeing to testify today. It is an exceptionally important hearing but also one whose time has come and is due.

This hearing will examine five issues that have been highlighted in part by the recent National Academies of Science report on laboratory management.

First, how can the relationship between the NNSA and its laboratories be streamlined to avoid the layers of bureaucracy as it currently exists?

Second, how can the NNSA and its laboratories restore a relationship of trust to minimize the detailed reporting requirements that have resulted from a lack of trust?

Third, how can the NNSA be aligned within the Department of Energy to achieve independence as originally envisioned when it was created 12 years ago?

Fourth, how can your laboratories be viewed as national security assets to the U.S. Government as a whole?

And fifth, can your laboratories, as currently configured and funded, meet the current Department of Defense nuclear stockpile requirements?

Those are the questions.

The New START treaty brought great attention to modernizing the laboratories? infrastructure which in many cases dates over 60 years to the Manhattan Project. The Budget Control Act has put constraints on the rate at which much of this modernization can be achieved but its importance has not been lost on this Congress, that in order to safely reduce the number of nuclear weapons deployed, we must at a minimum ensure that our infrastructure can maintain these fewer numbers of weapons so they are safe, secure, and militarily effective.

Many experts such as former Secretaries Bill Perry and Jim Schlesinger have stated the importance of this issue, and as recently as last month, General Kehler, the Commander in Chief of U.S. STRATCOM command, said before the full committee that, quote, of all the elements of the nuclear enterprise, I am most concerned with the potential for declining or inadequate investment in the nuclear weapons enterprise that would result in our inability to sustain the deterrent force. End of the quote. These are very serious words from the combatant commander that is charged with ensuring our nuclear deterrent and that it is capable of meeting the requirements levied on it by the President and the Secretary of Defense.

But as we examine the needs of each of your laboratories and the large investments that they require to modernize, we in Congress are worried and concerned that these investments will not be used to the maximum extent possible if the relationship between the NNSA and its laboratories is, as described by our National Academies witnesses, quote, dysfunctional.

I look forward to hearing from each of you in the most candid manner possible. And we are emphasizing candor, not that we would expect anything else, but I want to make sure that it is clear that we are really pushing hard because this is your chance to inform this committee on the issues we must be concerned with to help fix a broken relationship between the NNSA and its labora-

tories as we begin to draft our annual authorization bill for the Departments of Defense and Energy.

I also have the white paper endorsed by the three laboratory directors, and I would like to ask—and I am sure I will have here—unanimous consent that it be entered into the record.

[The information referred to follows:]

[SUBCOMMITTEE INSERT]

Senator NELSON. When Senator Inhofe gets here—my good friend and colleague—we will ask him for any opening remarks that he may make.

Now it is an opportunity, if we might just start with Dr. Shank and go down the line. I am going to emphasize brevity but, on the other hand, not at the risk of candor. Dr. Shank?

Dr. PATEL. I am Dr. Patel.

Senator NELSON. Oh, Dr. Patel?

**STATEMENT OF DR. C. KUMAR N. PATEL, PRESIDENT AND CEO, PRANALYTICA, INC.; CO–CHAIR, NATIONAL RESEARCH COUNCIL COMMITTEE ON REVIEW OF THE QUALITY OF THE MANAGEMENT AND OF THE SCIENCE AND ENGINEERING RESEARCH AT THE DOE's NATIONAL SECURITY LABORATORIES–PHASE 1**

Dr. PATEL. Thank you, Mr. Chairman. As you so well pointed out the importance of the three national laboratories, this study dealt with the present state looking at the management of science and engineering and how it affects the long-term sustainability of these activities while these activities, science and engineering, are very important for maintaining the nuclear stockpile safety, security, and its reliance.

Overall, we find that the status of management of science and engineering at the laboratories is in good shape, in good hands. However, there are a number of issues that need immediate attention, and these include, first of all, blurring of the responsibilities between NNSA and the laboratory managers, undue emphasis on formalities, and management by transaction rather than by oversight. The issue of management and oversight is not the same. Management at the microscopic level slows down individual's capability to be creative. It slows down the amount of work that gets done and overall it turns out to be less cost-effective than what it should be.

Yes, there were some problems earlier with respect to safety and security, but those are well under control. And now the time has come to carry out the management and oversight not by transaction but by having the proper systems in place because that, as we see from industrial experience, turns out to be the most cost-effective way of spending funds which are allocated, in this case public monies.

Mr. Chairman, thank you very much for allowing me to open the hearing.

[The prepared joint statement of Dr. Patel and Dr. Shank follows:]

Senator NELSON. My colleague and friend has arrived. In case you have any opening remarks, Senator, the floor is yours.

**STATEMENT OF SENATOR JAMES M. INHOFE**

Senator INHOFE. All right. Thank you.

I am anxious to pursue this with this panel that we have, and I think we have the right people that are here right now. You know, the Perry/Schlesinger Commission stated it was alarmed by the disrepair and neglect of our nuclear weapons stockpile and our complex. Biden had said maintaining our nuclear stockpile and modernization is essential. The President, President Obama, had said back in December of 2010, I recognize that nuclear modernization requires investment in the long term. He goes on and on making the commitment to do what is necessary.

However, at the same time, we hear from Dr. Michael Anastasio of Los Alamos National Lab. He said I am very concerned about that budget profile. That profile delays many of the issues that are a concern to us today especially in the science and engineering area. Much of the planned funding increases for weapons and activities do not come to fruition until the second half of a 10-year period. Now, we are seeing a lot of that nowadays. They say, yes, we are going to do it and the amount is going to be same. However, it is not going to happen for 5 more years. I think we can kind of read in there what we want to.

Secretary Gates talked about it. He said no way can we maintain a credible deterrent and reduce the number of weapons in our stockpile without either resorting to testing our stockpile or pursuing a modernization program. I think we all understand. One or the other is necessary. And after the New START program, we were promised by the administration to have a robust resources backing behind it, and yet that has not happened.

So I think in the full committee, we heard testimony from General Kehler, the Commander of the U.S. Strategic Command, who informed us of his concern with the budget and its failure to demonstrate a viable, long-term modernization strategy. Our witnesses today provide yet another opportunity to assess the adequacy of the request. I look forward to hearing from them, our National nuclear weapons labs, to better understand the impact of the NNSA's budget, what it will have on their ability to certify our existing stockpile.

So I say this and I am anxious to hear the truth from you guys. You know, can we really do all these reductions? Can we not keep the commitment that we made at one time and carry out what you have an obligation, in terms of certification?

So those are my concerns. What have you had? One witness? testimony so far?

Senator NELSON. Yes. Dr. Patel.

Senator INHOFE. Okay, continue and thank you, Mr. Chairman.

Senator NELSON. Well, thank you, Senator Inhofe. We stress how we have a working relationship, and I look forward to the questions here shortly.

Dr. McMillan? Okay, Dr. Shank?

**STATEMENT OF DR. CHARLES V. SHANK, SENIOR FELLOW, HOWARD HUGHES MEDICAL INSTITUTE; CO–CHAIR, NATIONAL RESEARCH COUNCIL COMMITTEE ON REVIEW OF THE QUALITY OF THE MANAGEMENT AND OF THE SCIENCE AND ENGINEERING RESEARCH AT THE DOE's NATIONAL SECURITY LABORATORIES–PHASE 1**

Dr. SHANK. Thank you for the opportunity to describe the results of our report on science and engineering management at the three national security laboratories.

I wanted to emphasize in my remarks some of the recommendations that we made as a result of our deliberations of our committee. We visited all three laboratories. We heard from management and staff at all levels.

First is the evolution of the mission. We heard a compelling discussion from the Deputy NNSA Administrator Don Cook talking about a new governance charter among four agencies, the Department of Energy, Homeland Security, Defense, and the Office of the Director of National Intelligence, that would allow the laboratories to make a transition from weapons laboratories to more broadly national security laboratories and that these laboratories would use their capabilities to tackle problems of importance to all four agencies. We think that in a time of constrained budgets and the complexity of the stockpile stewardship program, the opportunity to maintain capabilities by working problems for other agencies is a win-win and it is something that we hope that this expertise can be taken advantage and it is something that is encouraged by Congress.

Second, I want to spend some time discussing the relationship between the laboratories and oversight. We think that oversight is an extremely important responsibility of the NNSA. However, we observed that the relationship with the NNSA and the National security labs appears be broken. We think that this seriously degrades the ability to manage quality science and engineering, and we recognize that the importance of having that high quality in science and engineering is very important to achieve the mission ends, but a dysfunctional relationship seriously threatens that goal.

This is not a new observation. It has been discussed in previous reports. We see what appears to be a breakdown of trust, an erosion of partnering between the labs and the NNSA to solve complex problems. As you are well aware, the basic elements of this relationship between NNSA and its laboratories are an FFRDC relationship. We have seen an evolution of NNSA moving from partnering with the laboratories to solve scientific and engineering problems to assigning tasks with specific solutions and implementation instructions. This approach precludes taking full advantage of the intellectual and management skills that have been purchased to manage these laboratories under contract. In addition, we see issues in transactional oversight of safety, business security operations.

We think that there is a conflict and confusion over management roles and responsibility. We think this sometimes leads to scientific disputes. We have seen an example, a recent instance, in which NNSA headquarters tried to overrule a laboratory's best scientific judgment on how to carry out a task and subsequently language

appeared in a congressional report opposing the NNSA instruction. We think a better mechanism needs to be made to resolve scientific and technical issues. We are recommending that a technical advisory committee be established at the NNSA level. That would be a helpful mechanism in being able to resolve disputes and look at more broadly how the operations of the laboratories can be most effectively accomplished.

The erosion of trust is especially prominent with respect to Los Alamos, where past affairs and safety and security and business practices have attracted much national attention. But it has also spilled over to the other laboratories as well. This loss of trust and emphasis on transactional management has created an environment in which there has been a bias against experimental work. We think that this is a very important issue and one that needs to be dealt with.

In conclusion, I would like to say that looking into the future, we have heard from the committee. We have heard from NNSA and all parties that Los Alamos has greatly improved its performance, and we think that it is time to recognize that this has occurred and that the laboratories have strengthened to the point where they no longer need clear, special attention. And we are hoping that the relationship between the Department and the NNSA can be rationalized and renormalized in a way that will make the laboratories both effective and successful in their future missions.

Senator NELSON. Thank you very much.

I guess now I will just make sure I get it right. Dr. McMillan, your turn? Okay.

**STATEMENT OF DR. CHARLES F. MCMILLAN, DIRECTOR, LOS ALAMOS NATIONAL LABORATORY**

Dr. MCMILLAN. Thank you, Chairman Nelson. Ranking Member Inhofe, thank you. I appreciate the opportunity to speak here today.

I am Charlie McMillan. I am the Director at Los Alamos. I bring to this discussion 29 years of experience in the weapons program. Nearly 2 decades of that was with my colleagues at Livermore. The last 6 years have been at Los Alamos, and for about the last year I have been the Director.

I am proud of the incredible staff at Los Alamos especially during today's budget challenges and the recent workforce actions I have had to take at the laboratory. Their service to the Nation has been unwavering as it has been for the last 70 years.

Mr. Chairman, the 2010 Nuclear Posture Review, coupled with the 1251 report, set a course for the deterrent that in my view was credible and consistent. Now, because of budget pressure, I am concerned that we do not yet have a path forward for meeting all of our commitments. We continue to work closely with our colleagues at both DOE and DOD to find the best path forward.

NNSA governance will inevitably play a key role as we address mission and budget challenges.

The recent National Academy of Sciences report described the NNSA laboratory relationship as broken. Those were the words you used. It described a lack of trust, burdensome oversight, and structural flaws.

The weapons laboratories have served as trusted technical advisors to the Government. Today we are often managed as traditional contractors rather than as partners who can provide expertise to solve technical issues. Trust has been replaced by reliance on operational formality. As the Academy said, this approach is a mismatch. It stifles the innovation we must have to address challenging issues in our nuclear deterrent. It is the ability to innovate that drives the staff that I have responsibility for at Los Alamos to produce at the highest levels for our Nation. I believe that a governance model must include the ability to work within a risk framework to accomplish goals and priorities set by Congress and the administration.

Mr. Chairman, there are other issues in the nuclear enterprise. I am concerned that we are shifting the balance of priorities too far toward the near term at the expense of longer-term science needed to address future problems that will affect the stockpile. Deferring the construction of the CMRR nuclear facility leaves the country with no known capability to meet the current expectation. Those expectations are something like 50 to 80 pits per year. Furthermore, because of limited and aging infrastructure, it will take significant investments to produce even 20 or 30 pits per year.

With appropriate infrastructure investments, we can sustain a limited pit manufacturing capability. However, we will need to augment new pit production with a pit reuse strategy that is still in development. We have available legacy pits that are candidates for reuse. I am cautiously optimistic that we can reuse some of these pits, but we must do the scientific work to further understand the effects of aging and to provide modern safety, safety that starts within sensitive high explosive systems. If we choose this path, it will require an investment over the next 5 to 10 years.

Let me offer an analogy for you. It is a little bit like taking an engine out of a 1965 Ford Mustang and putting it into a 2012 Mustang and continuing to meet 2012 emission standards. You can probably do it but not without a lot of work.

Mr. Chairman, we succeed today because of the investments our Nation has made over the last 20 years, investments that have produced capabilities and insights that are already addressing today's challenges. Two examples would be the DARHT facility, as well as our modern high-performance computing capabilities. We must prepare today for the challenges we will inevitably face in the future.

In closing, I am increasingly concerned. Today I cannot say with confidence that we are on a path to a healthy program. The laboratories that we serve are among the greatest, supporting the deterrence with knowledge second to none. The country needs to decide whether it is willing to maintain this level into the future. If so, balanced investments must be made in life extension today, as well as in our abilities to solve the problems that we will inevitably face in the future. If not, we risk both the future of the deterrent and the ability of the laboratory to solve issues as they arise.

Thank you and I look forward to your questions.

[The prepared statement of Dr. McMillan follows:]

Senator NELSON. Thank you.

Dr. Albright?

**STATEMENT OF DR. PENROSE C. ALBRIGHT, DIRECTOR, LAWRENCE LIVERMORE NATIONAL LABORATORY**

Dr. ALBRIGHT. Mr. Chairman and Senator Inhofe, thank you for the opportunity to testify before the subcommittee.

I have submitted my full statement to the committee, which I ask be made part of the hearing record.

Senator NELSON. Without objection.

Dr. ALBRIGHT. If I may, I will now make a brief opening statement.

This is a challenging period for the Federal Government with many priorities that require attention at a time of budget austerity. This is also the case for the Nation's Stockpile Stewardship Program, including those activities at Lawrence Livermore National Laboratory.

I think it is worth reminding ourselves why we have a Stockpile Stewardship Program. It was formally begun in the 1990s and it is really an ambitious experiment. It is founded on the premise that the expertise of a workforce and the judgments that they make that results from a detailed understanding of the fundamental science of how nuclear weapons work can serve as a substitute for the expertise and judgment that we historically developed back in the days when we had multiple and frequent design efforts and we did testing in the desert.

It is important to note that at the time we stopped nuclear testing, we really did not think we understood well enough how weapons work. It is why we had the tests. And there were a great number of empirical factors and approximations that were built into the weapons design process that allowed efforts to proceed, but there was also a landscape of test failures that had, over time, indicated our lack of understanding of the basic underlying science. Hence, for stockpile stewardship to work, we needed to learn far more about the physical processes that transpire in the functioning of a weapon.

We have actually been quite successful in developing many of those science tools, in fact, probably more successful than many of the proponents, when the program started, would have imagined. But developing those tools remains extremely challenging. Our knowledge of the basic underlying physics is embodied ultimately in computer models. These models utilize scientifically justified approximations, and they are rendered more and more accurate by improvements in computing power and by controlled experiments that we do at Livermore and other laboratories at Los Alamos to determine some of the important needed parameters. And the idea here is to represent what we believe to be reality.

However, the thing you have to always worry about with these models is that they cannot become holy writ. It is absolutely crucial that they be tested repeatedly against experiments conducted at relevant physical conditions so that the assumptions and approximations embedded in the models can be verified and corrected as needed. To do otherwise is to invite disaster.

Hence, the pillars of the Stockpile Stewardship Program have included both the development of independent analytical capabilities utilizing the world's most capable computing platforms at Lawrence Livermore, at Los Alamos, at Sandia, but also the develop-

ment of experimental facilities to collect data on the conditions that are relevant to the operation of a nuclear weapon. It is worth noting that every nuclear state that has abjured testing is following the same approach to maintaining their stockpile.

And of course, the scientific understanding of nuclear weapons is not an end all by itself. It is rather a process that underlies our capability to maintain the stockpile. It informs our annual assessments. It informs how we react to issues that are raised during the surveillance program, and it informs how we conduct our life extension programs.

We are very excited about the recent accomplishments that we have made in this program, and I highlight many of these in my written testimony. But we are also very concerned about impediments to current programs and the long-term success of stockpile stewardship. So let me sort of stress four points.

First, without sustained support for nuclear weapons science, stockpile stewardship will eventually fail.

Second, provided that support is sustained, we do remain optimistic about the prospects for long-term success of this science-based stockpile stewardship. The skills that we derive from the science base, as I said earlier, enable the Nation to maintain a safe, secure, and effective deterrent and deliver on very challenging life extension programs.

Recognition and support of the NNSA laboratories serving as national security laboratories is actually very, very important to that nuclear stockpile mission. It complements and enhances the workforce. It adds depth and breadth and strength to the laboratories? capabilities.

And then finally, the NNSA laboratories would perform their vital national security mission far more effectively if they were managed as trusted partners of the Federal Government and governed in a more streamlined and cost-effective way consistent with the original intent of the federally Funded Research and Development Center construct.

Thank you for your attention, and I will be pleased to answer your questions during the hearing.

[The prepared statement of Dr. Albright follows:]

Senator NELSON. Thank you.

Dr. Hommert?

**STATEMENT OF DR. PAUL J. HOMMERT, DIRECTOR, SANDIA NATIONAL LABORATORIES**

Dr. HOMMERT. Chairman Nelson, Ranking Member Inhofe, thank you for the opportunity to testify.

I would like to request that my full testimony be made part of the record.

Senator NELSON. Without objection.

Dr. HOMMERT. I am Paul Hommert, Director of Sandia National Laboratories, a multi-program national security laboratory.

I would like to begin by putting my testimony in an overall context. It is my view that we have entered a new era for the U.S. nuclear deterrent, a period when the nuclear weapons enterprise must address for the first time modernization of the stockpile, which depends critically on the use and continued advancement of

the tools of stewardship; targeted upgrades to the production infrastructure; and maintenance of the current stockpile through a modernization transition period. Such imperatives create funding demands not seen in recent decades and will require risk-based prioritization of the program, along with continued emphasis on strong program management and cost- effectiveness.

With this background, now let me discuss the four major points of my testimony.

I am pleased to report that the appropriated fiscal year 2012 budget will allow Sandia to complete the 62A cost study for the B61 life extension program and initiate full- scale engineering development at a pace consistent with fiscal year 2019 first production unit with the scope agreed by the Nuclear Weapons Council.

Furthermore, the President's fiscal year 2013 budget request to Congress, if authorized and appropriated, does provide sufficient funds for Sandia to support the fiscal year 2019 first production unit schedule.

However, I must emphasize that beginning now consistent and timely multiyear is vital if the B61 LEP schedule is to be maintained.

Second, the schedule and scope of the B61 LEP relate to strong technical drivers, which are discussed in my September 2011 annual stockpile assessment letter. I recommend the members read the letter, and I welcome the opportunity to discuss it further.

Beyond the B61 program, as we move forward on modernization, we must have a clear understanding and broad agreement about the vision for our stockpile 20 years from now. That vision must be robust in the face of current and future treaty obligations, evolving policy direction, stockpile technical realities, our infrastructure capabilities, and fiscal constraints. I believe such a vision is possible and emerging and we are actively supporting the Department of Defense and NNSA as they work through this planning.

Finally, I am encouraged by the recent discussion concerning governance of the NNSA laboratories. In my view, reinvigorating the Government-owned and contractor-operated model, which implies Government oversight at the strategic rather than transactional level, offers the potential for improvements in operational performance, contractor accountability, and cost-effectiveness at the labs with attendant cost savings on the Federal side.

With respect to fiscal constraints, we recognize the funding required at Sandia for the B61 is significant. In my full testimony, I outline steps we have taken to control costs. These include changes to pension and medical benefits, leveraging the work we do for other Federal agencies, and the utilization of the tools of stewardship. Throughout this program, we will continue to see further cost efficiencies.

I just mentioned the work that we do for other Federal agencies. I strongly believe that today it is no longer possible for my laboratory to continue to deliver consistently on the commitments to the nuclear weapons program without the synergistic interagency work that attracts top talent, hones our skills, and provides stability through the nuclear weapons program cycles.

Regarding talent, I am pleased to tell you that we have been able to recruit to Sandia top talent to support the full range of our Na-

tional security programs. Specifically since fiscal year 2010, we have hired about 300 outstanding advanced degreed scientists and engineers directly into the weapons program. Of these, well over one-half are recent graduates anxious to begin their careers working on the Nation's nuclear deterrent. It is very important that we provide them with a stable environment to pursue the multiyear learning it takes to technically steward the Nation's nuclear stockpile now and into the future. To enable their success, we must strive for a national commitment to the program, for in the end the Nation's deterrent rests on the strength of our people.

Let me close by summarizing the key points.

Authorization and appropriation of the fiscal year 2013 budget request and consistent, timely multiyear funding are critical to a fiscal year 2019 FPU for the B61.

The schedule and the scope for the 61 is based on strong technical drivers.

We need a broadly agreed, 20-year detailed vision for our nuclear deterrent.

We are staffed and ready to execute the B61.

And operational performance, productivity, and cost- effectiveness can be increased at the laboratories by improvements to the Government construct under which we currently operate.

Thank you and I welcome your questions.

[The prepared statement of Dr. Hommert follows:]

Senator NELSON. Thank you.

We will do a 7-minute round. Senator Inhofe has to attend another hearing. So we will defer.

Senator INHOFE. I appreciate that.

I just returned from Afghanistan, and I kind of will say the same thing to you that I said to some of the commanders there. There are a lot of things that we need that we are not getting. They are not adequately funded. This is true at the labs. This is not your fault. You did a great job. All three of you are doing a great job with the hand that you are dealt, but I think we need to deal you a better hand, if I have said that right, Mr. Chairman.

Let me just mention a couple of things that I would like to get on record. Then I do have to go to the Foreign Relations Committee because I am actually the ranking there.

The fiscal year 2013 budget for the NNSA makes a number of significant changes to the nuclear weapons complex modernization plan the President supported when he asked for the Senate to ratify the New START treaty. Some of you were not really involved on a lot of those discussions, but in attempting to get the votes necessary for the New START program, commitments were made that affect you.

By deferring a major construction project at Los Alamos, the NNSA effectively terminated a key enabler necessary to meet STRATCOM requirements as well as the confidence necessary to support the future reductions. And during our hearing in March, General Robert Kehler, the head of the U.S. Strategic Command, testified that he is concerned with the lack of a plan and strategy to meet STRATCOM requirements. According to General Kehler, he will be—and I am quoting now—concerned until somebody pre-

sents a plan that we can look at and be comfortable with and understand that it is being supported.

So, Dr. McMillan, Dr. Hommert, Dr. Albright, if you would just answer these questions. I would like to get you on the record.

Do you share General Kehler's concerns?

Dr. MCMILLAN. Senator Inhofe, why do I not start since CMRR is my responsibility?

If I could, Chairman, I failed to ask to get my written comments into the record. So if they could please be included.

Senator NELSON. Without objection.

Dr. MCMILLAN. I would say we do not yet have a plan. In that I agree with General Kehler. However, from my perspective, I see a substantial amount of work going on both with DOD and with DOE, and at the laboratory we have been involved with that work to develop a plan.

I mentioned elements of that development in my testimony which is to talk about the concept of pit reuse. In my view, a plan is more than a concept. A plan involves ideas, a project plan, and funding that is consistent with that, and we are not yet at that stage.

Senator INHOFE. Okay.

Comments, Dr. Albright? Basically do you agree with General Kehler?

Dr. ALBRIGHT. Yes, I would say I generally do agree with him. I would just make the caution that because of the deferral of CMRR, the technical solutions that we are looking at for our life extension programs are constrained in a certain way that we are, I think, I would say, cautiously optimistic that we can accommodate those constraints, but it is by no means a done deal.

Senator INHOFE. Not with the current resources you have.

Dr. ALBRIGHT. With the current resources we have. The issue here gets around to pit reuse and how you can accommodate that pit reuse within the constraints of the NPR.

Senator INHOFE. Do you generally agree with that, Dr. Hommert?

Dr. HOMMERT. I would share General Kehler's view that right at this moment we do not have a plan, as I mentioned in the oral statement. It is very important that we can see what the stockpile we want to have 20 years from now because when you back up from that, we have to make technical choices or begin scientific work today that would position us to have that stockpile in the future. I am encouraged that I think such a plan can be developed, but we do not have that in hand today.

Senator INHOFE. The three of you heard me say in my opening statement that the commitment on behalf of the administration to modernize the nuclear weapons complex was a key element in the ratification of the New START treaty. Were you aware of that? Okay.

Do you agree that modernization is universally recognized as essential to the future viability of the nuclear weapons complex and the prerequisite for future reductions? You would generally agree with that statement?

Dr. HOMMERT. Well, I would say that modernization from a technical standpoint is required for the U.S. stockpile, yes.

Senator INHOFE. Is it true that this budget would result in a—and I am going to name some delays here—the 2-year delay in the B61 life extension program and also delay of the completion of the W46 life extension program by 4 years and then by 3 years the W78, W88 life extension program, those three extensions? This budget would result in those extensions?

Dr. HOMMERT. Yes. The budget is consistent with the timeframe.

Senator INHOFE. And lastly I would say does your budget provide the resources necessary to meet the DOD requirements.

Here is what I am trying to get at. These are not trick questions or anything. I am very much concerned. And it harms those of us who are trying to expand this program trying to meet the commitments that are out there that we should be meeting as a committee. We are on your side, but when we do not get you on record saying that there are some inadequacies we do not have much to hang our hat on. And I am concerned about this, about the requirements.

First of all, you talk about a letter that you sent. I am a little confused because I hear now and then the term "certification." Do you folks have to certify and is this in the form of a letter? How does that work?

Dr. HOMMERT. We are required annually to submit a letter to the Secretary of Energy, Secretary of Defense each individually stating our technical view of the annual assessment of the stockpile as to its safety, security—its safety and reliability.

Senator INHOFE. And modernization and——

Dr. HOMMERT. And requirements that might flow from that.

Senator INHOFE. That is good.

Dr. MCMILLAN. In addition, when a system first enters the stockpile system, Senator, we certify it at that point, and then we review it annually to make sure that things have not changed in a way that would cause us to have——

Senator INHOFE. You are actually certifying for that point in time, that snapshot.

Dr. MCMILLAN. That is right, and then we review that.

Senator INHOFE. All right. The subcommittee has been told that 1 or 2 years of additional funding will not be sufficient to put the U.S. nuclear weapons enterprise back on a sound footing. And I believe, having visited with the STRATCOM people, that their requirement is for NNSA to generate up to 80 nuclear pits per year, and the NNSA will not be able to achieve that rate until a new CMRR facility is in operation.

How critical are the uranium processing facility and the chemistry and metallurgy research replacement nuclear facilities to our future stockpile?

Dr. MCMILLAN. Senator, I have responsibility for that facility, so let me start.

The purpose of that facility, just to make sure we are all on the same page, is that it provides the analytical capabilities to ensure the quality. It provides analytical capabilities that can serve in nonproliferation/counterproliferation missions. And it is simply the ability to handle the number of samples that would be required when we produce pits in PF4 that we need that for. At this point,

without CMRR, we do not have a way that I know of to be able to make as many as 50 to 80 pits.

Senator INHOFE. I see.

Dr. MCMILLAN. We can make with investments that we do not yet have, but we could make maybe 20 to 30 with the facilities we have.

Senator INHOFE. And that is a very good answer, a good answer to the question. Any disagreement with that?

The last thing I want to mention, Mr. Chairman—I know my time expired and I do need to get back upstairs. But relating to these two $5 billion buildings, I do not quite understand. I have heard a lot of views on this that those funds and resources could be used elsewhere more effectively. Is there a reason that the two buildings have to be $5 billion buildings? Have you all looked into that and made recommendations?

Dr. MCMILLAN. Again, I have looked very hard at that again because of my responsibilities, and I can assure you that I pressured my team substantially on that.

What you always have with buildings like this is you have a range of prices. Our current estimate at Los Alamos is something in the region of $3.7 billion, but I can tell you as delay occurs, we are moving toward the upper end of that range. And the range that—your $5 billion is closer to the top end of that range.

But as a manager, I feel a deep responsibility for the taxpayers? dollars, to use those as efficiently as we can, and I can assure you I have worked closely with my teams to get the costs as low as we can while ensuring safety for the material that we handle.

Senator INHOFE. Well, and I appreciate your answer, and I think it is significant because a lot of the things that are happening there, delays, things that were not in my opinion agreed upon in advance when they signed the New START treaty, are budget-driven. So you look for places where the budget is on the other side of it. It just appears to me that some of that could be in better use.

I appreciate it, Mr. Chairman, your allowing me to do this so I can get back to my other committee.

Senator NELSON. Thank you very much, Senator. I appreciate very much your being here.

Dr. Shank, your recent study finds a lack of trust between the NNSA and its laboratories. I think you have outlined it as the relationship as oversight over transactions versus oversight over just—virtually oversight over processes. Can you tell us a little bit how you determined that lack of trust to draw that conclusion?

Dr. SHANK. In our discussions, we visited all three laboratories. We talked to site managers. We talked to all parties involved. And we looked at the core issue of how one does oversight and does oversight effectively. If you do oversight with a trusted organization, you create an overall system and you audit that system. If you do oversight where there is a lack of trust, you want to look at every transaction. You want to look at every time something moves. You want to look at every safety activity.

And we said, well, the really core problem is reestablishing trust so that one could put together a structure so that the laboratories could have very cost- effective oversight with fewer people more cost-effectively and begin to look how one does oversight in the in-

dustrial part of our society. We think it is eminently doable, but it means a very different way of going about doing this business.

Sandia has a model that they have attempted to do. It has been more than a decade in coming. It is not making progress. It seems to me, unless we do something different, we will be stuck with this approach.

So my view of this is there is a time now to think about not just doing oversight, but doing more effective oversight with less cost and that really is going to some kind of national standards, taking advantage of other agencies that could do oversight, that do oversight more broadly and begin to make the laboratories look like not only other industry but even some other national laboratories in places outside NNSA.

Senator NELSON. You are not suggesting that there not be oversight. What you are saying is you just cannot have oversight over every transaction, every movement, everything every day.

Dr. SHANK. Correct. Oversight is absolutely essential to assure the American taxpayer that the dollars are being spent well. We are in no way saying that that should be in any way done with less intensity. It should be done more efficiently, and when you do not trust an organization, you look at every movement. When you have trust and the laboratories have qualified through a process to have a system—they do not just have a system. you have to go through a qualification process—then you monitor that system and it is a more effective way of doing business. It is the way industry this kind of thing.

Senator NELSON. Monitoring and auditing.

Dr. SHANK. Through auditing.

Senator NELSON. I am going to ask each of the directors. Dr. McMillan, do you agree with what Dr. Shank has said?

Dr. MCMILLAN. I do. If I could just maybe add a little to what Dr. Shank said.

I think the operational issues of trust may be where things show up most for me, and by that, I do not just mean how people feel about it, but rather what shows up day to day at the laboratory. I firmly agree with the importance of oversight because we are in a Government-owned/contractor-operated situation, there are substantial liabilities. And so the Government has in my view an important governmental function in ensuring that we who have the responsibility for managing those facilities are doing it well and carefully.

Senator NELSON. And do you agree that the current situation involves a lack of trust?

Dr. MCMILLAN. I certainly see that at the operational level, just as Dr. Shank described it, the evidence being that so many of the transactions are individually monitored. Yes.

Senator NELSON. Dr. Albright, do you agree that there is this lack of trust?

Dr. ALBRIGHT. Yes, I do, and let me elaborate just a little bit.

The real issue here, I think, is part of it is the unwillingness of the Government to allow the people who they have actually hired to operate these facilities to make rational assessments of risk and operate the facilities and make the trades that they need to make in order to do the mission.

But I think the even larger issue is the idea that we at the National laboratories—you know, we are the corporate memory. We are the sinews and muscle and the brains of the nuclear complex. We need to operate as partners with the Federal Government, not as sort of suppliers or vendors in the kind of contractual model that I think really is a more pervasive attitude.

So I think we have to restore this idea that we are really linked arm and arm. We are here for the mission, both the Government side and the laboratories. We each have a role and responsibility to play, and we ought to be allowed to do that.

Senator NELSON. Dr. Hommert?

Dr. HOMMERT. Yes, I would agree. I would just say that the terminology ?lack of trust? to me equates to not functioning at the system level. And I actually believe that the model we operate today, even from the Government perspective, is not a highly effective oversight model in achieving an integrated overall improvement in the operational performance, the cost-effectiveness, the productivity of the institutions, which I think at a system level we share the same goal. And I think we are actually not progressing on that as effectively as we could because of the model we operate in.

Senator NELSON. If there was trust, then it would be much easier for the oversight to move away from transactional to more directional because you have been hired to do what now they do not trust you to do without their oversight. Right? Understandable. Thank you.

Senator Vitter, you have arrived. Do you have some opening comments you might like to make or would you like to go to some questions?

Senator VITTER. Mr. Chairman, I do not. I will wait until the questions and discussion, if that is appropriate now or a little later.

Senator NELSON. Okay, thank you. I think we are taking 7-minute rounds. So I have not seen a blue card, so I may not be over time yet.

Dr. Patel, your study found that the autonomy in the laboratories has significantly declined as federally Funded Research and Development Centers, a hallmark of the Department of Energy dating back to the Manhattan Project which has given rise to scientific excellence. Can you explain this perhaps in a little bit more detail?

Dr. PATEL. Yes. Thank you, Mr. Chairman.

What do I mean by autonomy? By autonomy, we mean a task is given and then it is monitored not on a transaction basis but on a performance basis, performance which is based on a system of checks and balances that, as the work is carried out, that are put in place.

What has happened and what we observed through our visits to the three laboratories, as well as discussions with a number of scientists, engineers, and mid-level managers, is that many of the decision-making capabilities no longer exist with them, resulting in a more short-term look at how S&E is carried out and much of the long-term planning often does not get done principally because of the transactional oversight that I just mentioned and we have heard about earlier.

So one issue is how do we go about getting to this issue of autonomy. I think especially in the S&E area where the work gets carried out not over a yearly period, but it is also over several years, and the importance of it cannot be minimized because that is what provides the underpinning of the primary responsibility of the three laboratories for the nuclear stockpile. In order to do that, what is required is a level of trust but, more than that, an understanding on the part of NNSA and other managers that the laboratory directors are the people who are closest to the real problems and should be given an opportunity to plan a program which assures the long-term reliability of the S&E, which then in turn impacts upon the long-term reliability of the nuclear stockpile.

The second issue with autonomy is an increasing amount of non-scientific and non-technical operational oversight of what gets done, and this very quickly results in some parts of the activity seem to be being discouraged. Especially experimental activities where a young scientist or an engineer wants to carry out an experiment to assure that certain expectations, certain modeling calculations are right, those are often slowed down. And the ultimate result is that the autonomy which should reside with the young people in deciding how to get things done is not there. It leads to, over the long term, difficulty in hiring the kind of outstanding people the laboratories need.

And I believe that a good example of an autonomous laboratory which produces a lot from my personal experience is Bell laboratories where I managed all of their physics and material science activities for a fair period of time. We were given overall responsibility to ensure that the physics or material science that was needed by the company was there, but we were not told how to do each and every single experiment. Yes, we were audited at the end of the year. Yes, we were required to provide progress reports, but nobody second guessed us in terms of what we were doing. And I think that level of autonomy should come back to the laboratory directors for us to assure that our taxpayer dollars get us the biggest bang for the buck.

Senator NELSON. Thank you.

Dr. McMillan, do you agree that there has been pressure on the independence of your laboratory compared to prior years?

Dr. MCMILLAN. I think there are two areas for that, Mr. Chairman.

First, let me refer back to the annual assessment process, the annual assessment of certification. In that regard, I feel no pressure on the outcomes of our studies, and were there any pressure there, I would be deeply concerned.

However, in the types of activities that Dr. Patel described, I share his concern. In particular, he talked about the assignment of tasks and then monitoring to see that they are finished. I would add to that ensuring that that assignment is at the right level because if the assignment is at a very low level, it becomes do this, do that, do the other thing. On the other hand, if it is accomplish this goal, I think that draws on the laboratory's skills.

Finally, as Dr. Patel mentioned in Bell Labs, I think there are other examples that we need to look to today to understand relationships between the Government and federally Funded Research

and Development Centers. Here I think of places like the Jet Propulsion Laboratory, the Applied Physics Laboratory at Johns Hopkins, et cetera. We have examples, and I think looking at those examples for models could be very helpful.

Senator NELSON. Dr. Albright?

Dr. ALBRIGHT. I actually have nothing to add. I think Dr. McMillan hit the nail right on the head.

Senator NELSON. Thank you.

Dr. Hommert?

Dr. HOMMERT. Yes, I agree, Mr. Chairman. And I would just add that I think this is a very pragmatic issue for us. As we approach modernization, it is very important that we can look to best leverage the funds. If we are tasked at a very fine level, we lose some of the ability to leverage and achieve overall cost-effectiveness and productivity as we try to accomplish modernization.

Senator NELSON. Senator Vitter?

Senator VITTER. Thank you, Mr. Chairman, and thanks to all of you for being here and, more importantly, for your work.

Like a lot of members on the subcommittee and otherwise, I have a single, very basic, fundamental concern which is funding for all this activity really being dramatically cut and changed since the New START treaty was passed in a way that is inconsistent with some of the fundamental discussions, including the section 1251 updated report that led to it being passed. And that is my big, big concern here. There are plenty of other areas of concern, but that is my big concern.

So, Dr. Hommert, let me start with you because I think you signed onto a letter that is a clear example of the scenario I am talking about. And in December you wrote Senators Kerry and Lugar as chairman and ranking member of Foreign Relations with other national laboratory leadership saying that, quote, we are very pleased by the update to the section 1251 report as it would enable the laboratories to execute our requirements for ensuring a safe, secure, reliable, and effective stockpile, et cetera. And also, quote, it clearly responds to many of the concerns that we and others have voiced in the past about potential future year funding shortfalls and it substantially reduces risk to the overall program. Close quote.

Since then, we passed New START and since then the budgets have suffered. So what is your current assessment of our staying on that promised section 1251 report path?

Dr. HOMMERT. Well, it is clear that since that letter, which I think was probably late 2010, some of the conditions have changed. We have a different plutonium strategy that will require, as Dr. McMillan can speak to, a different approach. We have a better understanding of the costs of modernization, and I think that right now, as I mentioned earlier, we do not yet have a plan that is completely closed and by that I mean with an authorized and appropriated budget plan in multi years that would lead me to believe the same level of confidence at that time. I believe we can get to that. And of course, in the intervening time, we have faced additional fiscal constraints overall which have clearly impacted the budget effort. So some further work is necessary to achieve that same level of confidence going forward at this point.

Senator VITTER. Today, as we speak, would you be prepared to sign the same type of letter and express the same level of confidence?

Dr. HOMMERT. I would not be able to do that today without seeing the details of the plan of how we would move the entirety of the stockpile through a modernization period given the current constraints we have.

Senator VITTER. The changes that have occurred, including strategy that affects spending—do any of those justify in your mind the level of budget cuts that we have seen in proposals since that assurance to Congress since the section 1251 report update?

Dr. HOMMERT. Well, let us see. I believe that we have pressure on both sides, downward pressure on the budget, also some cost estimates that in the intervening time both in the facility space and in the modernization effort require a new risk position on the program overall. We do not have that plan yet defined. So I guess I cannot quite answer that. What I can say is that clearly the budget picture is more constrained from both the costs of the enterprise and also the overall fiscal constraints that you are dealing with. That requires a new plan which we do not have at this point fully developed.

Senator VITTER. Dr. McMillan, I would like to ask you the same general sorts of things. You say in your testimony today that you, quote, continue to believe that the direction laid out in the Nuclear Posture Review and the 1251 report provides an appropriate and technically sound course. Close quote.

Dr. MCMILLAN. That is correct.

Senator VITTER. Now, first of all, I assume when you say the 1251 report, you mean that update.

Dr. MCMILLAN. The updated report, yes. Thank you.

Senator VITTER. Well, I agree that that is a sound course. My question is are we on that course anymore.

Dr. MCMILLAN. No, we are not on that course.

In answer to elements of the other questions you had asked, I see us in a position where our risk is increasing. We are working very closely with our colleagues in the Department of Defense and the Department of Energy to develop the plan that my colleague, Dr. Hommert, talked about. However, I believe that is a plan that has higher risk than the plan that we had laid out in the 1251 updated report.

Senator VITTER. So I take it from what you just said, first of all, the budget cuts since December 2010 did not flow out of developing a new plan. They just happened and we are trying to get a new plan built around that now.

Dr. MCMILLAN. I cannot speak to all the details of how the budget occurred. That is not something I am an expert in. But I can tell you that in the current budget environment, which is understandably constrained with the overall budget that our Nation faces, that we are working now to say how can we move forward given the budget we have. And it is a very difficult problem. The options are—

Senator VITTER. My only point is that these new numbers, these cuts happened first and we are trying to cope with it. It is not the natural outflow of a new, improved plan.

Dr. MCMILLAN. From my perspective, we do not yet have a plan because we do not have a budget that is associated with that plan that we understand yet.

Senator VITTER. I think also what you said a few minutes ago is that when we get there, you expect that new plan to put us at higher risk.

Dr. MCMILLAN. That is correct. This plan has more technical risk in it than the technical risk that we had in the plan that was laid out in 2010.

Senator VITTER. Well, Mr. Chairman, that is my big concern, and I think it is a pretty simple story. The Senate, I think, paid great attention to this testimony from these experts in December 2010, and I think the 1251 updated report was pivotal in passing New START through the Senate. Now, I did not vote for it, but I think it was pivotal in getting the affirmative votes. And here we are a year and a half later and it is sort of all out the window and all bets are off. And I am gravely concerned about that.

Now, I know we are in a tough budget environment, but it is not like we were running surpluses in December 2010. I mean, it is not like we are in a very different budget environment. We knew all of that then. And I am real concerned about our collectively having passed New START based on these promises, this course, and now hardly a year and a half later, we are way off course. We are trying to get a plan to catch up with lower budget numbers, and the experts tell us when we do—and we are not there yet—we will be at higher risk.

Thank you.

Senator NELSON. Thank you, Senator Vitter.

Dr. Shank, your report stressed the importance of NNSA laboratories being national security laboratories for the Government as a whole, and this was put forth in a governance charter signed by Secretaries Chu, Gates, Director of National Intelligence Blair, and Deputy Secretary of Homeland Security Lane.

Can you explain the importance of this charter? And do you see it as competition to other Government agency laboratories, and if there is, is competition such a bad thing?

Dr. SHANK. I believe the governance charter gives the agencies who signed onto that charter an opportunity to utilize the unique skills of the laboratories that have been developed as a part of their weapons mission. The weapons mission is becoming much more complex and costly. We just heard about cost in discussing that. By having the core capabilities that allow one to execute the weapons mission, having those capabilities exercised in problems that are important to the Nation, I think that is an extraordinary advantage and a cost-effective way for the laboratories to deliver on their mission.

I believe the capabilities are so unique that I do not see a competition of an issue arising. I do not think that is an issue from my perspective. However, I must say we as a committee did not study competition. We looked at what were the unique capabilities in the lab, and those are the ones that are likely to be used.

Senator NELSON. Dr. McMillan, what is your view on the importance of this governance charter, and do you feel that it creates from your perspective competition with the other laboratories? Or

do you, as Dr. Shank has indicated, feel that perhaps your approach is so unique that competition is not a factor?

Dr. MCMILLAN. Let me take the second question first, Mr. Chairman, if I may. I think, by and large, the reason that other organizations come to our laboratories is because we are able to offer unique capabilities to them. And so we look very hard to say are the questions we are being asked, the problems we are being asked to solve by DOD, DHS—are they aligned with the capabilities we have from the nuclear weapons work that we do and do we bring uniqueness to that.

In answer to your first question, I think in many ways the memorandum of understanding really is aimed at formalizing something that has been happening over time, and I think it is good in that regard because if there are important national security problems that the capabilities of the laboratories can be brought to bear on, particularly ones that then feed back in a positive way to our nuclear weapons mission, which I think almost all do, that it is very appropriate that these other organizations have better access to the laboratories.

Senator NELSON. Dr. Albright?

Dr. ALBRIGHT. So the NNSA national laboratories have the world's fastest computers. We have the world's biggest lasers. We have 25,000 collectively among us of the world's smartest people, all dedicated to—who work at the laboratory because they are dedicated to the mission of national security. To not put that into the service of the broader national security mission in my view would be a dereliction of duty for us. In fact, it is written into each one of the laboratory's charters. In fact, it is written into the NNSA charter that that is something that should happen.

Any Government program manager, whether he is sitting in the Defense Department or DHS or anywhere, has—certainly the Defense Department, for example—they have the ability and have had for a long time to make a decision as to whether they are going to one of their organic laboratories or they are going to go to a NASA laboratory or to a Department of Energy laboratory. And generally they choose to come to the National laboratories precisely because we have these kinds of capabilities. We are not cheap. So if you are a subject-matter expert with a particular problem to solve, you come to the National laboratories because you are trying to tap into that core set of—that set of capabilities.

I think the Mission Executive Council and this memorandum of understanding that you are referring to, as Dr. McMillan pointed out, really just is aimed at trying to get rid of some of the viscosity associated with the ability of these other agencies to interact with the laboratories. All three of us have been part of the ecosystem within the Defense Department for 50 years, and we have been within the ecosystem of the Department of Homeland Security from the day it was founded. So the real issue here is how can we bring this to a more strategic plane, how can these other agencies have a bit more insight into what our capabilities our and our sustainment of those capabilities so that they can make rational decisions.

Senator NELSON. Dr. Hommert?

Dr. HOMMERT. Yes, Mr. Chairman. I would just add to what my two colleagues have said. In my laboratory, we probably have the largest portfolio of work with other Federal agencies. To me it is a very great example of win- win. For us to execute the nuclear weapons mission, you need a set of capabilities that we sustain over time. That means recruiting new talent, sustaining their competence, developing their competence. There is just no way to really do that practically without broadening that work. They also bring back skills that they learn on other problems that benefit the weapons program.

A very practical example. The radar engineers at my laboratory today designing the B61 radar 5 years ago were working on things that were deployed in theater that supported our warfighter, very unique applications. That is in my view a really synergistic value for our taxpayer in the investments you are making for us to accomplish our core mission.

Senator NELSON. Thank you.

We have already explored the problems and the challenges with funding, but unless something is done to change the funding that is proposed—let me ask again. Is it true and my understanding correct that unless something is done, additional funding, you cannot meet the expectations that we have got in place for modernization of the weapons in accordance with what our expectations are for the New START treaty? Dr. McMillan? And if I have not stated the question properly, would you state it for me?

Dr. MCMILLAN. Well, let me try answering and see if I come close to the question.

On the B61 life extension program, if we have stable, predictable funding, as we have laid out in what we call the 62A study, I believe we are positioned to deliver on that system by 2019.

Senator NELSON. Stable funding is what you are talking about.

Dr. MCMILLAN. Stable funding is a very big deal at the levels that we have laid out. Unpredictability makes it very difficult for us.

I am much more concerned in the areas of the W78 and the W88 because the delay in CMRR directly affects our plans there. And as I mentioned earlier, we are working today with both DOD and DOE to develop a plan forward for the 78 and the 88 systems. So we do not yet have that plan, and until we have it, I cannot really answer your question.

Furthermore, there is a body of technical work—and I mentioned some of this in my written testimony—associated with pit reuse that we are working on with experiments coming this summer that could say that strategy looks like it is worth pursuing or that strategy may have serious problems. And so there is a body of technical work that will have to be done. I think in fact it will stretch over about 5 years.

So I am not sure that answers your question, Mr. Chairman. I hope it comes close.

Senator NELSON. Dr. Albright?

Dr. ALBRIGHT. So let me first echo what Dr. McMillan said, that certainly in the near term with some additional technical risk, we can execute, we believe, the life extension programs that are over

the near term. But I will again reemphasize there is some technical risk associated with that.

My larger concern is not so much what happens next year or the year after that. It is what happens 5 or 10 years from now. If we do not continue to sustain funding of the overall effort, particularly in the areas of understanding the science of nuclear weapons, both experimentally and analytically, we run a huge risk ultimately in our ability to continue to do assessments and to conduct future life extension programs. I think it is worth noting that there are life extension programs on the books, on the schedule today where the people executing them will have been trained by people who themselves have never conducted a nuclear test or designed a nuclear weapon from scratch.

And so this idea that we have to continue to sustain the overall program—it is not just about life extension programs, but the overall program—to assure that we have a workforce that is qualified to do these life extension programs as they come up and is qualified to understand when an issue shows up during surveillance whether it is a minor problem or a major problem, that is where I worry, that over time that sustained level of effort will be under huge pressures.

Senator NELSON. Dr. Hommert?

Dr. HOMMERT. Mr. Chairman, I think your question was very well articulated. Let me emphasize an area of concern that I have, and that is on the B61. When we changed the schedule from 2017 to 2019, which I understood and agreed, we did, however, exhaust the schedule margin that we had. The 2019 schedule is important for real technical reasons which we would discuss in a closed session. So that is putting a challenge to us overall as an enterprise, including the Congress, that we have the consistent multiyear funding that is required. If we have significant breaks due to a continuing resolution or other changes that might occur that you all understand far better than I, that is going to put that schedule in a significant risk position. And so I think that this is a near-term test for our National commitment to modernization in executing the 61.

And beyond that, I do believe that we can craft a plan to take the larger scope of our deterrent forward, but I would agree with what Dr. McMillan said, that that will involve some increased risk because of where we are at in our overall production capabilities.

Thank you.

Senator NELSON. Senator Vitter?

Senator VITTER. Yes, Mr. Chairman, if I can just try to clarify the same point because I think it is our big core concern. I do not mean to try to dumb down this question too much for our sake, but let me ask it in a very sort of real-world way.

On a scale of 0 to 10, how would have you described your comfort level, your level of confidence with the plan overall in December 2010 based on the updated 1251 report, based on all of the commitments that were made at that time, and compared to that number, how would you peg your confidence level, your comfort level today?

Dr. HOMMERT. Well, since I am the one whose signature is on that 2010 letter, let me start. I never thought of it in quite those

terms, Senator, but I would say that—it is hard, but let me try and use your scale.

I would say back then if everything that we anticipated—and recognize we did not have the detailed costing yet on some of these programs, but if we assumed that the costing was in alignment with what we expected in the 1251—and that confidence was probably 8, you know, just down from technical issues we knew we would have to deal with, budget realities, and budget uncertainties.

If you look today, for my case, since my lab is so much on the hook with respect to the B61, I have confidence in what we have costed to execute that work and the plan we have laid out. We know exactly, I think, what we have to accomplish. If budgeted, I am at a 9 or 10 in our ability to do that.

When I look at the entirety of the modernization, then I am back at a lower level of confidence, 5 or 6, because we have not adjusted a plan to some of the boundary conditions that you articulated earlier and changes of funding and production capability.

I hope that is not too complicated an answer, but I do look at a near-term and long-term perspective of where I sit today.

Dr. ALBRIGHT. So if you look at the situation that existed in 2010, the program that was in place in 2010 was adequately funded, given what we understood about the costs. And at that point, you would have to give it something like a 9 or a 10. That was a pretty robust program.

Two things, of course, changed: the costs went up and the budgets came down. And one of the impacts of that budget, as we have all pointed out, has been some additional technical risk which drives you down to sort of—I hate to put a number on these things, but sort of a 6 or a 7 or a 5 or something in that ball park because we have not done the work yet to know whether or not we can actually overcome some of those technical issues.

Senator VITTER. Okay.

Dr. McMillan?

Dr. MCMILLAN. Your scale is, of course, difficult to use but I will try anyway. And it is interesting that we all sort are falling in the same range.

I was involved in the weapons program in 2010. So while my name is not on the document, I certainly had discussions about it.

You know, I would say if 10 is a slam dunk, we know we can do it, the risks are very low, we were not there, but somewhere around an 8 or a 9 probably right.

My reasons today for saying something more in the range of a 6 are that I see higher risks in our path forward, as I said in an earlier answer, and I am very concerned about the long term because I see the pressures of doing things in the here and now, which we have to do—I fully agree—possibly shifting the balance so far that we then increase the risk in the future. And so those are the reasons why I would back off today.

Senator VITTER. Thank you, Mr. Chairman.

Senator NELSON. Thank you, Senator Vitter.

We are all talking about how we are able to do more with less and how we can be more cost-effective in delivering the required mission expectations. Let me turn to what some perceive as at least one way to streamline oversight and move away from trans-

actional oversight and at the same time save funding because that is a critical piece as well. If current oversight is getting in the way, that is not cost-effective. If we can find a way to streamline it, perhaps we can save funding in the process and also increase productivity by reducing the size of the NNSA's site offices that oversee the laboratories. It seems to me that now that the weapons design laboratories are operated by for-profit entities, that the site offices do feel obliged as civil servants to grade the approximately $200 million in fee that is awarded to the operators of the three design laboratories. Now, I know that we are all interested in the savings.

But let me start first, Dr. McMillan. Do you believe that the local site offices can be streamlined so that the oversight is not transactional, that it is more on the basis of trust and verified, to use an often used expression, the verification being operational as opposed to transactional?

Dr. MCMILLAN. So I think you have hit on really the key point there, Mr. Chairman, that the amount of oversight depends on what type of oversight you do. And at some level, for the kinds of oversight we have today, it is probably the case the site offices are sized in the right ball park to provide that kind of oversight.

Senator NELSON. Let me interrupt just for a second. How many positions are there at the local site?

Dr. MCMILLAN. At Los Alamos, it is a bit over 100.

And so if we go to a different model for that oversight, I believe we could have smaller contingents both at the site, as well as possibly at headquarters. The scale of the organization is determined by what it has to do in my view.

Senator NELSON. And is there a potential of cost savings by not having—not just in terms of the personnel costs of the local site offices, but of the costs associated with having to respond to the oversight?

Dr. MCMILLAN. Yes. At the laboratory, I do not know for sure what the numbers are, but I know that I have people whose main job is responding to oversight issues. And if we were able, in the way that our National Academy colleagues have talked about, to change that model, I believe there would be efficiencies inside the laboratory as well.

Senator NELSON. Well, I am going to get to our experts here in a second too.

Dr. Albright, how many are there located in your local site?

Dr. ALBRIGHT. So I do not think I have the exact number. Just roughly a little bit over 100 Feds and about 20 or 30 support contractors. It is about 130 people all together.

Just two points. First, the site offices are part of the oversight infrastructure in NNSA and DOE, but they are not the entire story.

Senator NELSON. Well, under any set of circumstances, you might have fewer if they are doing a different kind of oversight.

Dr. ALBRIGHT. Well, I think to echo the point that Dr. McMillan made, you would have to ask yourself—so right now we have a transactional oversight model where everything is reviewed, everything is very hands-on. We have well over 1,000 audits that occur every year. If, on the other hand, you migrate to what the National Academies have been talking about, which is more of a set stand-

ards than audit kind of model, then I think you have to ask yourself the question what do I actually need to have physically located at the site in order to accomplish that.

You know, this is for comparison sake. I would point out that if you look at the way the Department of Defense does this at a place like Hopkins, APL, or Lincoln Lab, the numbers of people they have are—you can count on the fingers of one hand or two, and they have a relatively small office in the Office of the Secretary of Defense that periodically conducts audits and does all the things that they need to do, safety audits, that sort of thing. So again, the question comes up what do you actually have to have physically on site. That is one point.

The other point again is that you have people—it is not just the site offices. In a lot of ways, they are responding to commands that come from headquarters. So you have a fairly large infrastructure in the, for example, Health, Safety, and Security Office within the Department of Energy. There are hundreds of people there. And then there are equivalent activities within NNSA itself.

Senator NELSON. Dr. Hommert?

Dr. HOMMERT. Well, we have a similar size site office, order, 100 as well.

And you know, I can use this sort of one metric. I think we all have a performance evaluation plan that we do. It is sort of a contractual statement of performance on a yearly basis with NNSA. That document is sort of, in our case, 60–65 pages of fairly detailed evaluation of performance against at, again, a somewhat overused term today, "transactional" level. And we have talked with NNSA about this, about moving that to a higher level to something leaner but still demanding upon our performance. And I believe that that will allow cost savings on both sides of the equation very definitely. It will not happen overnight. We did not get to this position overnight, but it would allow us to change the direction of that, and I am encouraged that the dialogue is happening in that direction.

Senator NELSON. Dr. Shank and Dr. Patel, I know you have stated that streamlining the operations could save costs if there could be another way of doing it apart from a transactional analysis and oversight. Dr. Shank, what kinds of recommendations would you make to streamline the process, to change it so that you get the kind of oversight that is required that is cost-effective?

Dr. SHANK. Well, I think if we are going to have the number of people we have in the site offices, we are going to have the current model. Unless we change the oversight model, we are not going to see change. And then there is a chance to have a sharply reduced number of people.

I think that just counting the number of people in the site offices is not correct. I think what was represented here by Dr. McMillan was he has got people in his own lab each feeding each of these people in the site offices. It is also correct there is a large group of people in the Forrestal Building that also create work for all the people to do.

We have to fundamentally rethink about how we can do oversight cost effectively. There is always an argument to be made if we just spend a little more money, we can be a little more safe or a little more this or a little more that. At some point, that last in-

crement of cost gives us a very little for a great deal of money. And I think there is a chance for substantial operational savings if we take a different model, and the way to look for models that will work—their description was two other laboratories that do things differently, do not have the huge overhang of people doing oversight. We can also look to industry for those models.

I would say that in order to qualify a system, it is going to require some investment. I believe that over a period of time, a very short period of time, you would then get to reap the rewards of that and begin to wind the thing down into a more rational, understandable way that industry or other Federal FFRDC's would look—DOE would look similar to them. And I think that we would have organizations within the laboratories also right-sized to be able to deal with a cost-effective approach.

Senator NELSON. Is it fair to say that the uniqueness of the labs does not drive the unique method of oversight, that other labs have a different standard of oversight, different methodology of oversight that works? Can you describe, for example, in other labs where you have outside sources coming in and checking out and inspecting for safety or security or the like?

Dr. SHANK. Well, I think the example was given by Dr. Hommert that his laboratory, Mesa Laboratory, looks very much like an Intel laboratory down the street. They have very similar safety records. The expenditure on the safety is much, much higher at the Mesa facility than it is at Intel. I think we can learn a great deal by looking at how Intel does this, and they do it in a way in which is done standard in industry. You have a system. You audit that system. You keep track of where you are. It takes fewer people to do that if there is a system in place that you can recognize. Intel simply could not be in business if they did the level of transactional oversight that has been done in these laboratories.

Senator NELSON. Well, who would go to the Intel laboratory to check out for worker safety?

Dr. SHANK. OSHA. Other agencies that do these kinds of oversight for industry seem to me to be some of the ideal skill base, maybe even the exact people, to do that kind of thing at the laboratories. In the past, having external oversight has been investigated. It is one of those things that is very difficult. There are many different issues one way or another whether to do that.

I personally believe if the laboratories look like other institutions, they are better off because the people like OSHA who are investigating the laboratories do that in a way that would be most cost-effective. Industries have to operate. The laboratories have to operate. There is not an individual power base that says we do this, this, one kind of thing here regardless of cost. OSHA has the burden of making organizations safe, the safety and health of the workers, but it also has to do that in a way that it is actually possible to comply with cost-effectively.

Senator NELSON. Dr. Patel?

Dr. PATEL. I think almost everything that needs to be said has been said. But let me comment on two things.

Having the transactional oversight adds cost by having too many people both at site offices plus in the laboratories plus at NNSA. So that is one part of the cost.

The second part of the cost, which is hidden cost that is incurred by the laboratory because that oversight gets in the way of getting people to do the right things at the right time at the right cost. What we will accomplish if we change from a transactional oversight to a systems-based oversight is that we will empower the laboratory directors and empower the people who are there to deliver the right product at the right price.

Senator NELSON. Well, now I will ask the directors. Are you comfortable inviting OSHA into your operations versus having the site offices doing a similar sort of thing? And there are probably other areas of oversight other than, let us say, worker safety or overall safety. Would there be, as in the case of any other lab, available outside inspection teams or agencies capable of doing the similar work? Dr. McMillan?

Dr. MCMILLAN. It is interesting that we are having this discussion today because just yesterday, as part of a discussion with DOE and NNSA, the issue of OSHA was on the table. I do not know enough at this point, Senator, to be able to answer your question definitively. I would say that I am optimistic because industry makes it work. Other laboratories make it work.

Senator NELSON. That is what I was going to say. If industry makes it work with other laboratories and if what they are looking for is similar to what they would be looking for within your laboratories, perhaps the one difference is nuclear?

Dr. MCMILLAN. And that might be an area where we would treat that differently because that is not a normal part of most industries. And it is different also than what happens in the nuclear power industry. So I think there may be some exceptions but I would say overall I am optimistic with a recommendation such as our National Academy colleagues have suggested in part because it puts the laboratories on a level playing field.

Senator NELSON. Dr. Albright? You do not have to agree, you know.

Dr. ALBRIGHT. No, no, no. It is hard not to agree.

Let me just sort of cite some—give you some information on that. Just in the environmental safety and health area, we have reviews that are conducted by the DOE Health, Safety, and Security Office, the NNSA Safety and Health Office, the Defense Nuclear Facility Safety Board. We have two people on site, 22 environmental safety and health functional managers at our site office with staff, and then there are 30 annual reviews by State and local governments. We actually are in California, so we have to Cal-OSHO which is more stringent than OSHA. And then, of course, we do our biannual reviews and ISO 14001 and 1801 as well. So what you see is a lot of overlap, a lot of duplicative effort. We would be delighted to fit within the OSHA regulatory framework along with the safety culture that you get with the ISO standards.

Senator NELSON. Dr. Hommert?

Dr. HOMMERT. Yes. I will make two comments in this regard.

First of all, I think it is important to recognize that there is a difference from industry for us. These are Government-owned facilities. So there is a very clear and appropriate role for effective Government oversight.

What I do believe, though, is that we have a vast body of industry standards that we can work against and that then the Government can utilize and benefit from the fact that that is largely in place whether it is ISO or it is OSHA or other standards and construction or the like. And I think getting that model right that says, yes, there is a reason that the Government has to look at facilities they own but let us take advantage of what is already in place.

The second thing I would like to say on this is that, as Dr. Albright has identified, while we deal with a model that has duplication in it—and that is true and we deal with a model that I think can be improved from a cost- effective standpoint, and I agree that that is true—the thing that concerns me the most in what we operate in today is that I actually believe the complexity of the model impedes the ability for me to advance the safety culture or the overall operational culture of my organization. And while we have an outstanding safety record, we can be better. And I believe the complexities of what we operate actually impede our ability to move to a higher level. And in the end, since these are my coworkers, I care deeply about them. And that is probably the strongest motivation I have to say can we do something different.

Senator NELSON. Well, would it not be appropriate to expect the NNSA to establish what the standard is to begin with, as in the case of the other non-governmental laboratories? So if you do not have a standard, what do you measure it against? And so if the standard is established, then others can come and measure against that or against their own standards which might even be higher. Is that fair, Dr. Hommert?

Dr. HOMMERT. I agree, Mr. Chairman. There has to be clarity. Again, the Government has to be clear on what their expectations are and how they wish us to be measured. But again, there is a lot available to for them to take advantage of. And then they have to find a way to verify and appropriately audit that in a way and ultimately trust that we will operate at the system level against those standards. I agree.

Senator NELSON. Dr. McMillan?

Dr. MCMILLAN. Yes, I agree.

Senator NELSON. Dr. Albright?

Dr. ALBRIGHT. I agree.

Senator NELSON. And to other panelists here, from your own experience looking at other laboratories, a simple question. Does it work having these other entities come in and measure against standards?

Dr. SHANK. I have actually looked at that with respect to a lab that I used to manage compared to JPL, and they have a more effective process than what we had then at the Department of Energy which is similar to what NNSA—it is actually more difficult today than in my days. But yes, they do have effective not only oversight of health and safety, but you also have financial oversight and there are systems for that and systems for oversight of human resources. There are, in fact, standards for all of these operational activities in laboratories that are standard throughout industry that could be brought in.

And the worry that I would have is that we bring those standards in and keep all the site offices and all there together. That is my nightmare. I think that if you make a different model, it has to be clear that it is a different model. You do not have both models.

Senator NELSON. Dr. Patel, do you agree with that?

Dr. PATEL. Yes, I agree with that. Even though my experience has been limited to private industry, I can wholeheartedly say that having standards which are accepted by others being your guiding principles helps everybody.

Senator NELSON. Well, thank you. That is really all the questions I have.

Now, what question did I not ask that I should have? I know what I know. I do not know what I do not know.

Well, thank you all for being here today, for being straightforward and candid in your remarks. We appreciate it very much. And as we work toward finding some solutions here, your input is going to be extremely helpful. Thank you.

[Whereupon, at 4:11 p.m., the subcommittee adjourned.]